APOLLO G&N Specification
PS1900011 L
Original Issue Date:
Release Authority: TDRR
Class A Release
TDRR 18135

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

(Continued) **Record of Revisions**

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				AC	NASA
7/5/66	J	29995	1, 2, 4, 7, 8, 9, 11. Now 14 pages,	MGM	—
			was 11 pages. WS/AC		
8/24/67	K	34404	1 RDL/AC	MGM EA	—
2/15/68	L	35641	12	MGM EA	---

This specification consists of page i [illegible] to iii including i-I and 1 to 14 inclusive.

APPROVALS	NASA/MSC	MIT/IL	AC

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 11

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 12

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 13

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	URK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	URK
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35639	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK

REV																
SHEET																
REV STATUS OF SHEETS	REV	CR			CH	CH	CP	CP	CP	CP	CP	CP	CP	CP	CR	CR	CP	CP
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

NASA APPROVAL A.METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 15

MIL 1377A6 12-65

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
1000000		CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK

REV																
SHEET																
REV STATUS OF SHEETS REV	CH			CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH	CH
SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
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APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 15

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

FORM 2084 REV 367

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NOT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

FORM 2084 REV 367

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS A/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS A/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS A/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM ACT SHIPPING CONT.	
291	L	5	6014000-011	LEM ACT SHIPPING CONT.	
300	L	5	6014056-011	ACT COVERS	
310	0512	5	1022980-011	CUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS ACT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 4

FORM 2084 REV 367

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 5

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900344-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 10

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902656-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 12

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06.	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	GEN MTG,FIXTURE	
1431	051	34	1902204-011	GEN MTG,FIXTURE	
1433	1	34	1902204-021	GEN MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	GEN MTG, FIXTURE	
1437	12	34	2900067-021	GEN MTG. FIXTURE	
1438	12	34	2900067-031	GEN MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	36	2900067-041	GEN MTG FIXTURE	
1440	12	34	2900067-051	GEN MTG FIXTURE	
1441	12	34	2900067-061	GEN MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901425-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	GEN HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	GEN HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	GEN HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,GEN	
1481	051	1 5	1900009-021	TRANSPORTATION CART,GEN	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,GEN	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,GEN	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	±X	1 5	6900001-011	CONN. COVER SET LEM	
1651	±X	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	~~512L~~XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	~~512L~~XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	~~512L~~ XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1683	512L	234	2900895-041	CALIBRATION & TEST ASSEMBLY SCM/PSAAM	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CM	SHEET 12

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	GEN INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 13

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GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
I = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CW	SHEET	2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZ-IN	NOT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CW	SHEET	3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016940-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019526-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019584-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014008-000	LEM AOT SHIPPING CONT.	
291	L	5	6014008-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022668	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CW	SHEET	4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CW	SHEET	5

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = AUES
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = REI (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE A	CODE IDENT NO 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016548-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014000-000	LEM-AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001644-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022469	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CW	SHEET 4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CW	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E	1900030
SCALE-NONE	REV LTR CV		SHEET 6

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E	1900030
SCALE-NONE	REV LTR CV		SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E	1900030
SCALE-NONE	REV LTR CZ		SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	0512	1	1901492-041	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E	1900030
SCALE-NONE	REV LTR CZ		SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON.	
1190	051	2 8	1901675-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901676-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY /
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG, FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG, FIXTURE	
1438	12	34	2900067-031	G&N MTG, FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	

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SCALE-NONE	REV LTR	C2	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE- PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP,BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900063-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900068-011	PSA ADAPTER MODULE(LEM)	

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SCALE-NONE	REV LTR	C2	SHEET 12

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ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1606	L	1	6900068-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900068-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	C2	SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	CZ	SHEET 14

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	GEN INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	CV	SHEET 15

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	GEN HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-283
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II,	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900086-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	CV	SHEET 16

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	29C1628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DA	SHEET 14

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 15

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 16

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

B 1897190

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS 23392		
A	REVISED PER MXC 309331	17 MAY -65	DAS EF
Ⓜ B	INITIAL RELEASE CLASS A PER TDRR 23392	10-18-65	MRC FE

REQUIREMENTS:

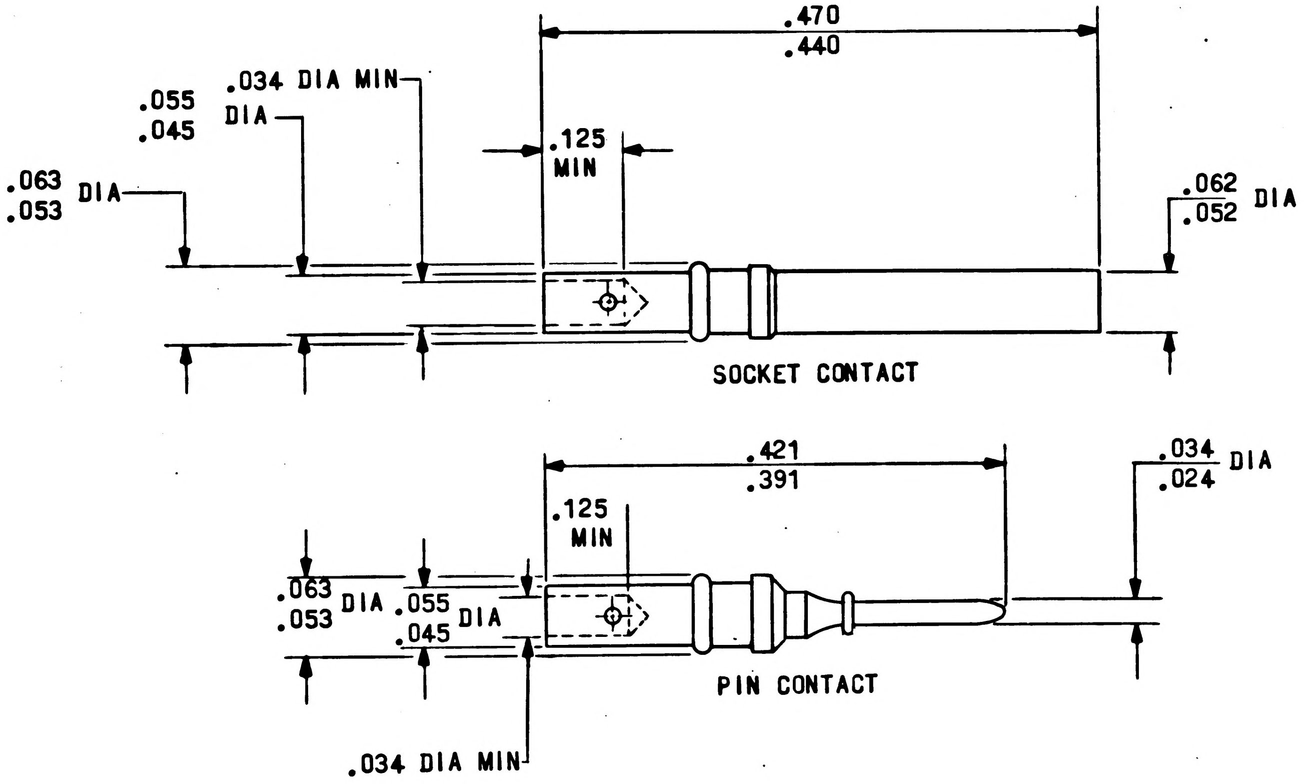
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. PARTS SHALL BE PACKAGED WITH CONTAINERS PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, QUANTITY OF PARTS, DATE CODE, OR DATE OF MANUFACTURE, PLUS NASA DRAWING AND DASH NUMBER.

2. INSPECTION AND ACCEPTANCE:
   - A. CONTACT WITHDRAWAL FORCE: 0.5 OUNCES MINIMUM USING PIN DIAMETER OF $\genfrac{}{}{0pt}{}{0.0283}{0.0282}$. 5 OUNCES MAXIMUM USING PIN DIAMETER OF $\genfrac{}{}{0pt}{}{0.0295}{0.0294}$. INSERTION OF PINS SHALL BE A DEPTH OF 0.140 MIN.

3. DESIGN:
   - A. BODY: SHALL BE COPPER ALLOY PER MIL-C-26482.
     - (1) FINISH:
       - (a) PIN: GOLD PLATED PER MIL-C-26482, EXCEPT THICKNESS TO BE 100 MICROINCHES THICK OVER BASE METAL.
       - (b) SOCKET: GOLD PLATED PER MIL-C-26482, EXCEPT THICKNESS TO BE 100 MICROINCHES THICK OVER BASE METAL.
   - B. CURRENT RATING (MATED): 3 AMPERES.
   - C. CONTACT RETENTION: 20 POUNDS MINIMUM IN DIRECTION OF MATING FORCE WHEN INSTALLED IN CONNECTOR.
   - D. CRIMP AND CONTACT RESISTANCE: 0.050 VOLTS MAXIMUM AT 3 AMPERES WHEN MEASURED FROM THE REAR OF THE PIN CONTACT CRIMP BARREL TO THE REAR OF THE SOCKET CONTACT CRIMP BARREL.
     - (1) DRY CIRCUIT CONTACT RESISTANCE: 20 MICROVOLTS DC MAX, AT 10 MILLIAMPERES.
   - E. CRIMP TENSILE STRENGTH: 8 POUNDS MINIMUM. USE NO. 22 AWG STRANDED WIRE.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR CRIMPING, INSERTION AND WITHDRAWAL OF CONTACTS.



NASA DASH NUMBER	CONTACT TYPE
-1	PIN TYPE
-2	SOCKET TYPE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
NONE

FINAL FINISH
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO - Contract NAS 9-497

DRAWN R. Fox DATE 4 JAN 65
CHECKED [illegible] 5 JAN 65
APPROVAL [illegible] 6 JAN 65
APPROVAL [illegible] 10/21/65
NASA APPROVAL C. C. Metzger
MIT APPROVAL [illegible] 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897190
SCALE NONE
WT
SHEET 1 OF 1

1897190

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

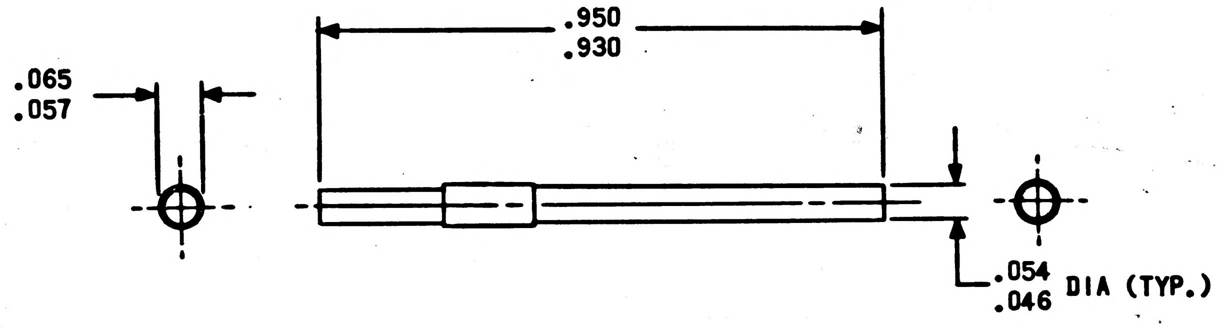
1897192 A

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE CLASS A PER TDRR 24043	18 OCT 65	JR

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING SHALL BE PER ND 1002215, CLASS I, CODE 3.
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL: TEFLON, PER AMS 3651 AND MIL-P-19468A.



PROCURE ONLY FROM APPROVED SOURCES LISTED ON CONTRACTOR'S ACCECPTABLE SUPPLIERS LIST

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497

DRAWN M. Graham DATE 5-MAY 65
CHECKED W. Diehl 7 Jan '65
APPROVAL Emerson Kurn 7 JAN 65
APPROVAL J. M. Watson 10-11-65
NASA APPROVAL CHATZGER
MIT APPROVAL 6 Nov 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLUG, PROTECTIVE,
DUST AND MOISTURE SEAL -
NO. 22 GAGE CONTACT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897192
SCALE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897194 C

REVISIONS 17843			
SYM	DESCRIPTION	DATE	APPROVAL
C	UPGRADED TO CLASS A PER TDRR 17843	20-MAR-65	B.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP CONTACTS SHALL BE PER 1010770 OR 1897190.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL AND CLAMP; ALUMINUM ALLOY AS REQD PER MIL-C-26482
       - (b) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT PLUS SILICONE RUBBER GROMMET.
       - (c) GASKETS: SILICONE RUBBER
     - (2) INSULATION RESISTANCE: 100,000 MEGHOHMS AT 25°C, 500 VDC
5000 MEGOHMS AT 125°C, 500 VDC
     - (3) FINISH: SHELL; CLEAR CONDUCTIVE ANODIZED. FINISH SHALL BE NON-OUTGASSING.
     - (4) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER, AND DATE CODE OR DATE OF MANUFACTURE. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER AND REVISION LETTER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC
     - (3) WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 50 MILLIVOLTS AT 3 AMP WHEN MEASURED FROM THE REAR OF THE SOCKET CONTACT CRIMP BARREL TO THE REAR OF THE PIN CONTACT CRIMP BARREL.
     - (5) OPERATING TEMPERATURE: +125°C
   - B. MECHANICAL REQUIREMENTS:
     - (1) COUPLING MECHANISM: PUSH PULL QUICK DISCONNECT
     - (2) MAX ENGAGEMENT FORCE: MIN DISENGAGEMENT FORCE (WITH CONTACTS). PER TABLE
     - (3) CONTACT RETENTION: 20 LBS MIN, IN DIRECTION OF MATING FORCE.
     - (4) ALTITUDE IMMERSION: PER MIL-C-26500.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

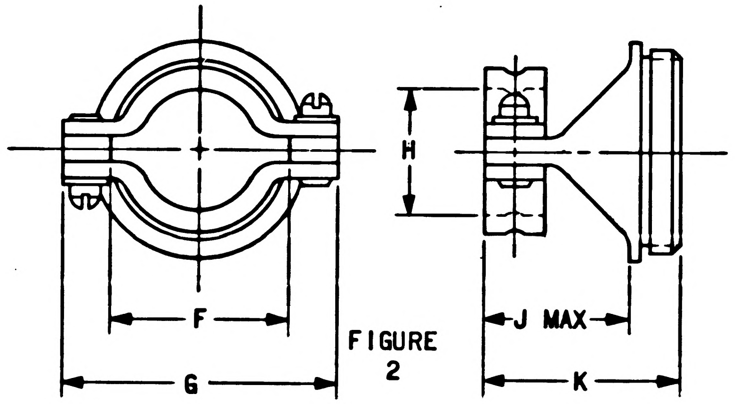


FIGURE 2

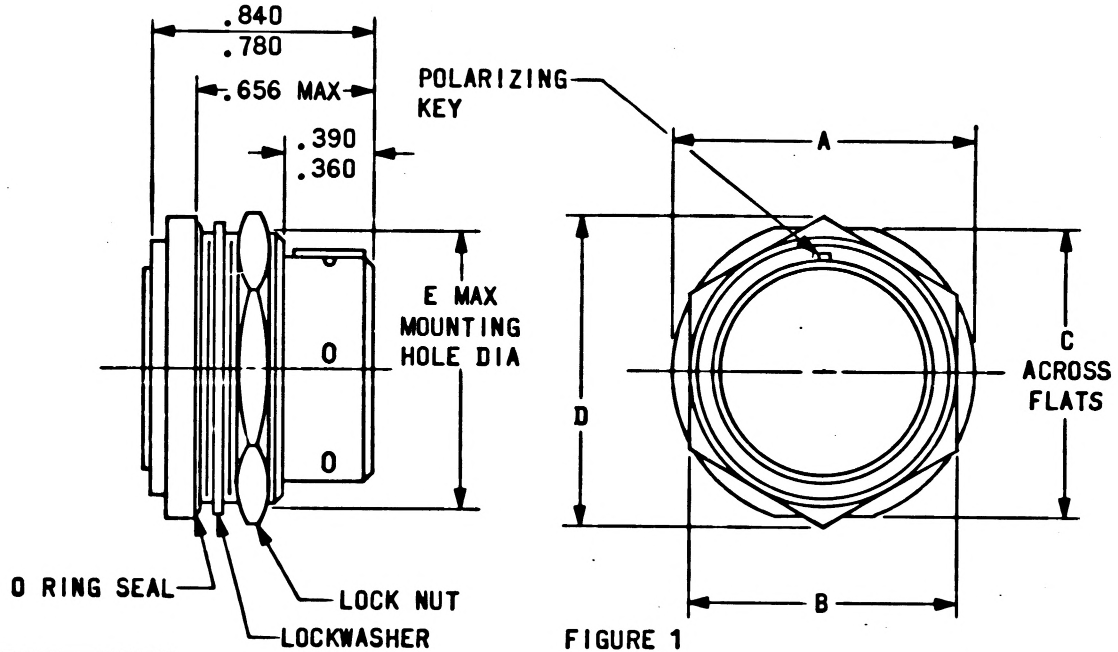


FIGURE 1

1897194

C	C
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .005 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
NONE

FINAL FINISH
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO Contract NAS 9-497

DRAWN J. Janowiak DATE 6 JAN 65
CHECKED V. Molye 7 JAN 65
APPROVAL 3/1/65
APPROVAL L. Gedeman 3/24/65

NASA APPROVAL MAR 26 1965
MIT APPROVAL MAR 26 1965

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL- AND STRAIN RELIEF CLAMP

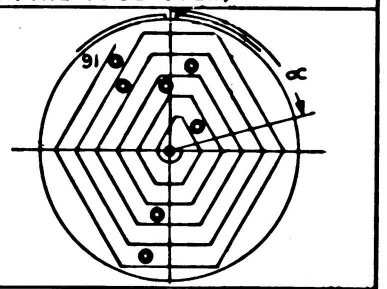
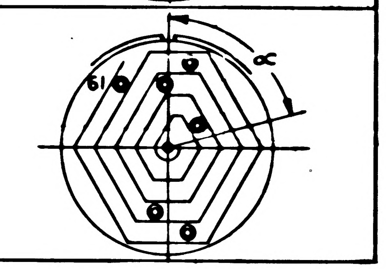
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1897194
SCALE —
WT
SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897194 C

REVISIONS 17843			
SYM	DESCRIPTION	DATE	APPROVAL
C	UPGRADED TO CLASS A PER TDRR 17843	20-MAR-65	B

NASA DASH NUMBER	MANUFACTURER'S PART NUMBER	DEGREES α	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS					MOUNTING THREAD SIZE	FIG NO.	STANDARD INSERT ARRANGEMENT (MATING FACE VIEW)
					A	B	C	D	E			
-001	DSM04-27-30P-7021	N=0	91	PIN	1.343 1.297	1.265 1.235	1.317 1.307	1.458 1.428	1.135	1-1/8-18NEF-2B	1	
-002	DSM04-27-30PW-7021	W=225										
-003	DSM04-27-30PX-7021	X=150										
-004	DSM04-27-30PY-7021	Y=75										
-005	DSM04-19-33P-7021	N=0	61	PIN	1.218 1.172	1.077 1.047	1.161 1.151	1.242 1.212	1.010	1-20UNEF-2B	1	
-006	DSM04-19-33PW-7021	W=225										
-007	DSM04-19-33PX-7021	X=150										
-008	DSM04-19-33PY-7021	Y=75										

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER

STRAIN RELIEF CLAMP DIMENSIONS

NASA DASH NUMBER SEE NOTE 3	FIG NO.	MANUFACTURER'S PART NUMBER	DIMENSIONS				
			F	G	H	J	K
-070	2	32700-1-07	.718 .688	1.171 1.141	.625 .595	.594	.781 .751
-080	2	32700-1-08	.921 .891	1.421 1.391	.828 .798	.594	.781 .751

NOTES:

1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED DEGREES CLOCKWISE RELATIVETO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. STRAIN RELIEF CLAMP DASH NUMBER -070 FOR USE WITH CONNECTOR DASH NUMBERS -005 THROUGH -008; STRAIN RELIEF CLAMP DASH NUMBER -080 FOR USE WITH CONNECTOR DASH NUMBERS -001 THROUGH -004.
4. MATES WITH NORMAL SOCKET CONTACT PLUG PER 1010771 OR 1897207.
5. MOUNTS TO .093 MAX THICK PANEL.

1897194

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. Contract NAS 9-497

DRAWN J. Janowrek DATE 6 JAN 65
CHECKED V. Molye 7 JAN 65
APPROVAL 3/1/65
APPROVAL 3/24/65
NASA APPROVAL MAR 26 1965
MIT APPROVAL MAR 26 1965

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL- AND STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1897194
SCALE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 17843			
SYM	DESCRIPTION	DATE	APPROVAL
C	UPGRADED TO CLASS A PER TDRR 17843	20-MAR-65	B.
D	REVISED PER TDRR 19967	11 JUN 65	JRS

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP CONTACTS SHALL BE PER 1010770 OR 1897190.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL AND CLAMP; ALUMINUM ALLOY AS REQD PER MIL-C-26482
       - (b) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT PLUS SILICONE RUBBER GROMMET.
       - (c) GASKETS: SILICONE RUBBER
     - (2) INSULATION RESISTANCE: 100,000 MEGHOHMS AT 25°C, 500 VDC
5000 MEGOHMS AT 125°C, 500 VDC
     - (3) FINISH: SHELL; CLEAR CONDUCTIVE ANODIZED. FINISH SHALL BE NON-OUTGASSING.
     - (4) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER. THE MANUFACTURERS PART NUMBER MAY APPEAR ON THE PART.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC
     - (3) WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 50 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM THE REAR OF THE SOCKET CONTACT CRIMP BARREL TO THE REAR OF THE PIN CONTACT CRIMP BARREL.
     - (5) OPERATING TEMPERATURE: +125°C
   - B. MECHANICAL REQUIREMENTS:
     - (1) COUPLING MECHANISM: PUSH PULL QUICK DISCONNECT
     - (2) MAX ENGAGEMENT FORCE: MIN DISENGAGEMENT FORCE (WITH CONTACTS). PER TABLE
     - (3) CONTACT RETENTION: 20 LBS MIN, IN DIRECTION OF MATING FORCE.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

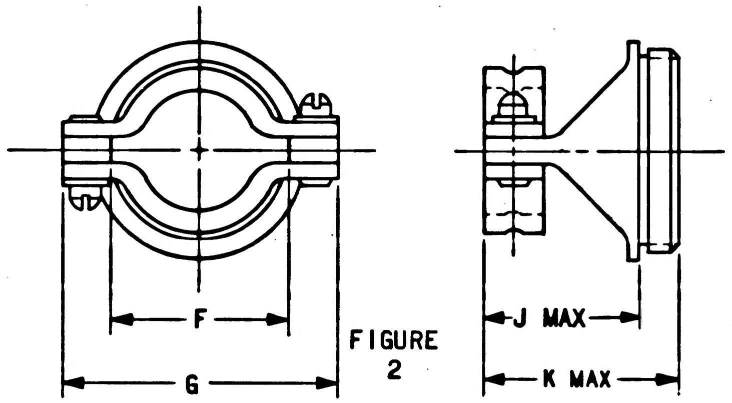


FIGURE 2

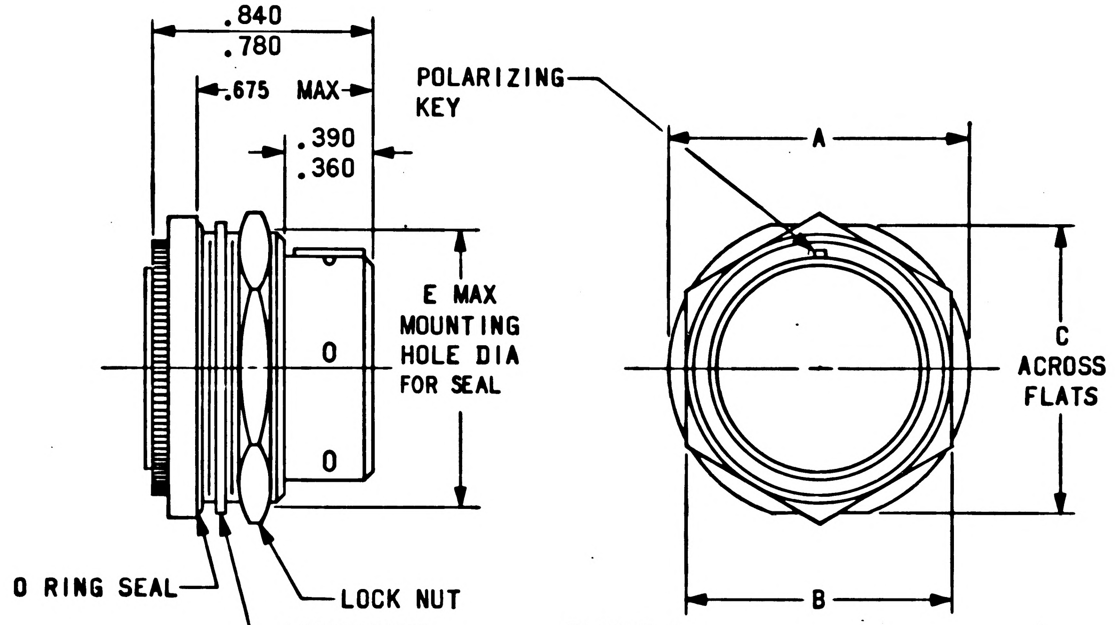


FIGURE 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON		
APPLICATION			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± .005 ANGLES ± — DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE MASS DWG NO Contract NAS 9-497	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
MATERIAL SEE REQUIREMENTS	DRAWN J. Janowiak DATE 6 JAN 65 CHECKED V. Molye 7 JAN 65 APPROVAL 3/1/65 APPROVAL L. Gelman 3/24/65	CONNECTOR, RECEPTACLE, ELECTRICAL- AND STRAIN RELIEF CLAMP SPECIFICATION CONTROL DRAWING	
HEAT TREATMENT NONE	NASA APPROVAL MAR 26 1965	CODE IDENT NO. 99974	SIZE C
FINAL FINISH SEE REQUIREMENTS	MIT APPROVAL MAR 26 1965	SCALE —	WT

NASA DRAWING NO. 1897194

SHEET 1 OF 2

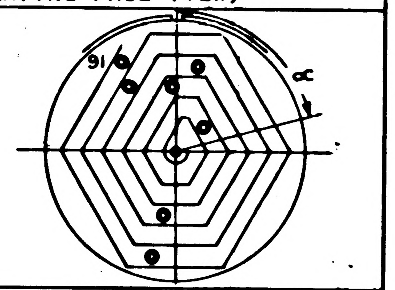
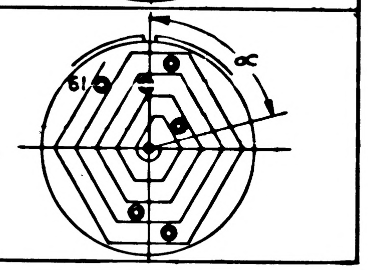
4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897194 D

Ⓜ

REVISIONS 17843			
SYM	DESCRIPTION	DATE	APPROVAL
C	UPGRADED TO CLASS A PER TDRR 17843	20-MAR-65	B
D	REVISED PER TDRR 19967	11 JUN 65	JRS

NASA DASH NUMBER	MANUFACTURER'S PART NUMBER	DEGREES α	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS A	B	C	D	E	MOUNTING THREAD SIZE	FIG NO.	STANDARD INSERT ARRANGEMENT (MATING FACE VIEW)
-001	DSM04-27-30P-7021	N=0	91	PIN	1.343 1.297	1.265 1.235	1.327 1.297		1.135	1-1/8-18NEF-2B	1	
-002	DSM04-27-30PW-7021	W=225										
-003	DSM04-27-30PX-7021	X=150										
-004	DSM04-27-30PY-7021	Y=75										
-005	DSM04-19-33P-7021	N=0	61	PIN	1.218 1.172	1.077 1.047	1.171 1.141		1.010	1-20UNEF-2B	1	
-006	DSM04-19-33PW-7021	W=225										
-007	DSM04-19-33PX-7021	X=150										
-008	DSM04-19-33PY-7021	Y=75										

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER

STRAIN RELIEF CLAMP DIMENSIONS

NASA DASH NUMBER SEE NOTE 3	FIG NO.	MANUFACTURER'S PART NUMBER	DIMENSIONS F	G	H	J	K
-070	2	32700-1-07-7021	.718 .688	1.171 1.141		.695	.790
-080	2	32700-1-08-7021	.921 .891	1.421 1.391		.695	.790

NOTES:

1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED DEGREES CLOCKWISE RELATIVETO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. STRAIN RELIEF CLAMP DASH NUMBER -070 FOR USE WITH CONNECTOR DASH NUMBERS -005 THROUGH -008; STRAIN RELIEF CLAMP DASH NUMBER -080 FOR USE WITH CONNECTOR DASH NUMBERS -001 THROUGH -004.
4. MATES WITH NORMAL SOCKET CONTACT PLUG PER 1010771 OR 1897207.
5. MOUNTS TO .093 MAX THICK PANEL.

D C B A

1897194

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO Contract NAS 9-497

DRAWN J. Jenowas DATE 6 JAN 65
CHECKED V. Molye 7 JAN 65
APPROVAL 3/1/65
APPROVAL Gelman 3/24/65
NASA APPROVAL MAR 26 1965
MIT APPROVAL MAR 26 1965

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL-
AND STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897194
SCALE
WT
SHEET 2 OF 2

4 3 2 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 17843			
SYM	DESCRIPTION	DATE	APPROVAL
ⓜ C	UPGRADED TO CLASS A PER TDRR 17843	20-MAR-65	B.
Ⓜ D	REVISED PER TDRR 19967	11 JUN 65	JRS
E	REVISED PER TDRR 26630	3 MAR 66	JIMP J.E.G.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP CONTACTS SHALL BE PER 1010770 OR 1897190.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL AND CLAMP; ALUMINUM ALLOY AS REQD PER MIL-C-26482
       - (b) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT PLUS SILICONE RUBBER GROMMET.
       - (c) GASKETS: SILICONE RUBBER
     - (2) INSULATION RESISTANCE: 100,000 MEGHOHMS AT 25°C, 500 VDC
       5000 MEGOHMS AT 125°C, 500 VDC
     - (3) FINISH: SHELL; CLEAR CONDUCTIVE ANODIZED. FINISH SHALL BE NON-OUTGASSING.
     - (4) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER. THE MANUFACTURERS PART NUMBER MAY APPEAR ON THE PART.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
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         - NASA PART NUMBER
         - DATE CODE, OR DATE OF MANUFACTURE
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3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
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     - (3) WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 50 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM THE REAR OF THE SOCKET CONTACT CRIMP BARREL TO THE REAR OF THE PIN CONTACT CRIMP BARREL.
     - (5) OPERATING TEMPERATURE: +125°C
   - B. MECHANICAL REQUIREMENTS:
     - (1) COUPLING MECHANISM: PUSH PULL QUICK DISCONNECT
     - (2) MAX ENGAGEMENT FORCE: MIN DISENGAGEMENT FORCE (WITH CONTACTS). PER TABLE
     - (3) CONTACT RETENTION: 20 LBS MIN, IN DIRECTION OF MATING FORCE.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

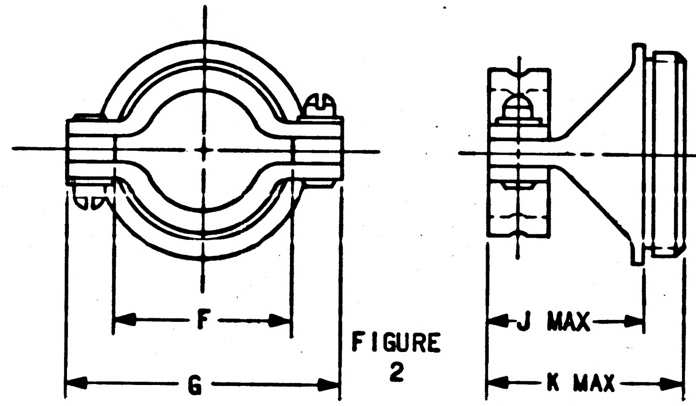


FIGURE 2

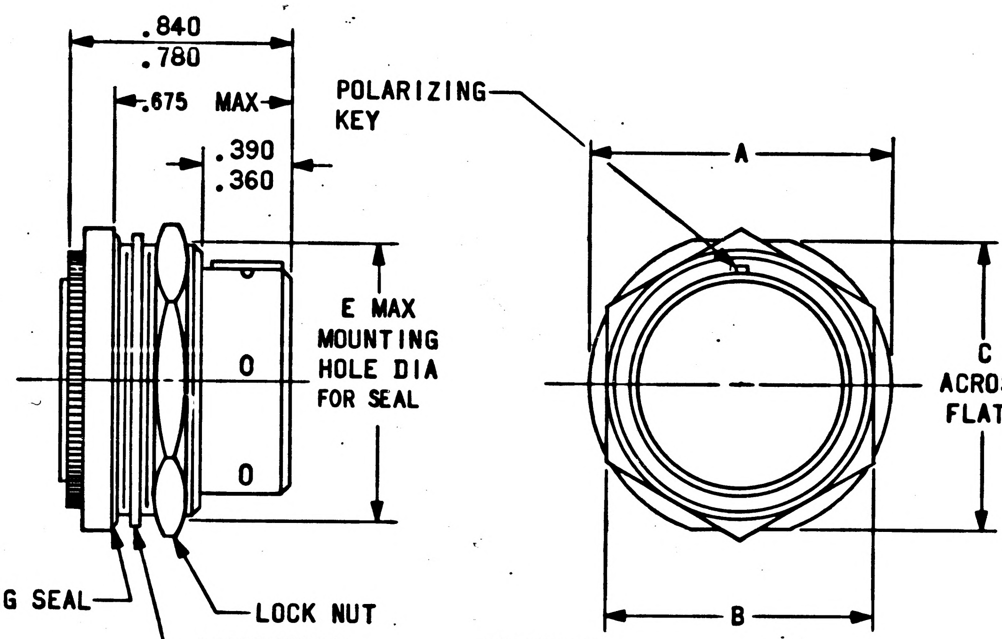


FIGURE 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .005 ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
NONE

FINAL FINISH
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497

DRAWN J. Janowiak DATE 6 JAN 65
CHECKED V. Molye 7 JAN 65
APPROVAL 3/1/65
APPROVAL L. Gedeman 3/24/65

NASA APPROVAL MAR 26 1965
MIT APPROVAL MAR 26 1965

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL-
AND STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1897194

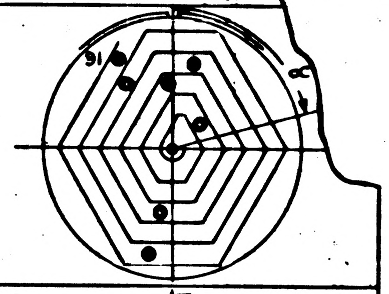
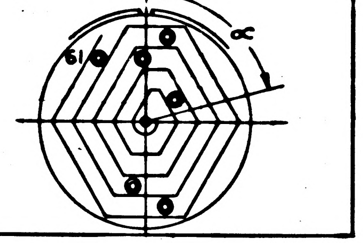
SCALE — WT SHEET 1 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897194 E

REVISIONS 17843

SYM	DESCRIPTION	DATE	APPROVAL
C	UPGRADED TO CLASS A PER TDRR 17843	20-MAR-65	J
D	REVISED PER TDRR 19967	11 JUN 65	JRS
E	REVISED PER TDRR 26630	3 MAR 66	JIM P J.E.G.

NASA DASH NUMBER	MANUFACTURER'S PART NUMBER	DEGREES α	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS A	B	C	D	E	MOUNTING THREAD SIZE	FIG NO.	STANDARD INSERT ARRANGEMENT (MATING FACE VIEW)
-001	DSM04-27-30P-7021	N=0	91	PIN	1.343 1.297	1.265 1.235	1.327 1.297		1.155 1.130	1-1/8-18NEF-2B	1	
-002	DSM04-27-30PW-7021	W=225										
-003	DSM04-27-30PX-7021	X=150										
-004	DSM04-27-30PY-7021	Y=75										
-005	DSM04-19-33P-7021	N=0	61	PIN	1.218 1.172	1.077 1.047	1.171 1.141		1.030 1.005	1-20UNEF-2B	1	
-006	DSM04-19-33PW-7021	W=225										
-007	DSM04-19-33PX-7021	X=150										
-008	DSM04-19-33PY-7021	Y=75										

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER

STRAIN RELIEF CLAMP DIMENSIONS

NASA DASH NUMBER SEE NOTE 3	FIG NO.	MANUFACTURER'S PART NUMBER	DIMENSIONS F	G	H	J	K
-070	2	32700-1-07-7021	.718 .688	1.171 1.141		.695	.790
-080	2	32700-1-08-7021	.921 .891	1.421 1.391		.695	.790

NOTES:
1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED DEGREES CLOCKWISE RELATIVETO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. STRAIN RELIEF CLAMP DASH NUMBER -070 FOR USE WITH CONNECTOR DASH NUMBERS -005 THROUGH -008; STRAIN RELIEF CLAMP DASH NUMBER -080 FOR USE WITH CONNECTOR DASH NUMBERS -001 THROUGH -004.
4. MATES WITH NORMAL SOCKET CONTACT PLUG PER 1010771 OR 1897207.
5. MOUNTS TO .093 MAX THICK PANEL.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL ——
HEAT TREATMENT ——
FINAL FINISH ——

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497
DRAWN J. Jenowab DATE 6 JAN 65
CHECKED V. Molye 7 JAN 65
APPROVAL 3/1/65
APPROVAL 3/24/65
NASA APPROVAL MAR 26 1965
MIT APPROVAL MAR 26 1965

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL- AND STRAIN RELIEF CLAMP

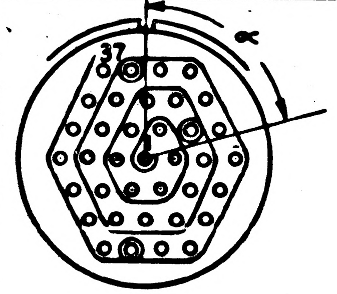
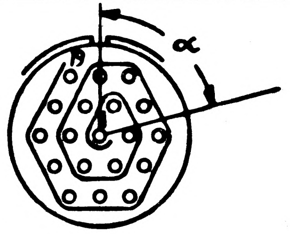
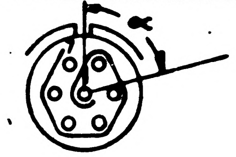
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 80230
SIZE C
NASA DRAWING NO. 1897194
SCALE
WT
SHEET 2 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	E	THIS SHEET ADDED PER TDRR 26630	3 MAR 66	JIMP J.E.G

NASA DASH NUMBER	MANUFACTURER'S PART NUMBER	DEGREES α	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS					MOUNTING THREAD SIZE	FIG NO.	STANDARD INSERT ARRANGEMENT (MATING FACE VIEW)
					A	B	C	D	E			
-009	DSM04-12-14P-7021	0	37	PIN	1.086 1.040	.953 .923	1.077 1.047		.838 .813	13/16-20UNEF-2B	1	
-010	DSM04-12-14PW-7021	W=225										
-011	DSM04-12-14PX-7021	X=150										
-012	DSM04-12-14PZ-7021	Y=75										
-013	DSM04-7-15P-7021	0	19	PIN	.898 .852	.828 .798	.890 .860		.716 .691	11/16-24NEF-2B	1	
-014	DSM04-7-15PW-7021	W=225										
-015	DSM04-7-15PX-7021	X=150										
-016	DSM04-7-15PY-7021	Y=75										
-017	DSM04-3-9P-7021	0	7	PIN	.773 .727	.640 .610	.765 .735		.591 .566	9/16-24NEF-2B	1	
-018	DSM04-3-9PX-7021	X=150										

THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± —
3 PLACE DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
APPROVAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRAWN J. Parker DATE 3 MAR 66
CHECKED J. GRIEB 12 MAR 66
APPROVAL Ettorwentz 3-22-66
CONTRACT NAS9-497
NASA APPROVAL A. C. METZGER
MIT APPROVAL W Kyle 22 Mar 66

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL— AND STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 80230
1897194
SCALE —
SHEET 3 of 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897201 A

REVISIONS 17836

SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS 'A' PER TDRR 17836	20-MAR-65	A.T.H.

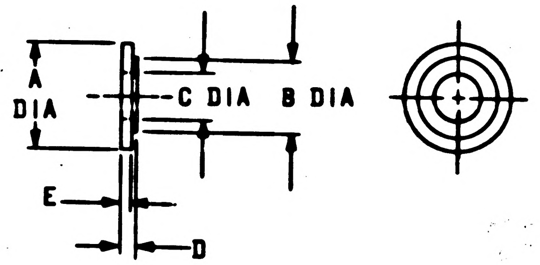
REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. INSPECTION AND ACCEPTANCE:
   A. MECHANICAL REQUIREMENTS: VULCANIZED PHENOLIC FIBER.

NASA DASH NUMBER	A	B	C	D	E	MANUFACTURER'S PART NUMBER
-001	.440 .420	.310 .245	.200 .190	.067 .057	.045 .030	6527

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH NONE

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG. NO. Contract NAS 9-497
DRAWN M. [illegible] DATE 27-JAN-65
CHECKED [illegible] 29 Jan 65
APPROVAL [illegible] 29 JAN 65
APPROVAL J. M. Watson 2-23-65
NASA APPROVAL [illegible] MAR 26 1965
MIT APPROVAL [illegible] MAR 26 1965

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WASHER, SHOULDER
(FIBER)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1897201
SCALE
WT
SHEET 1 OF 1

1897201

1897204

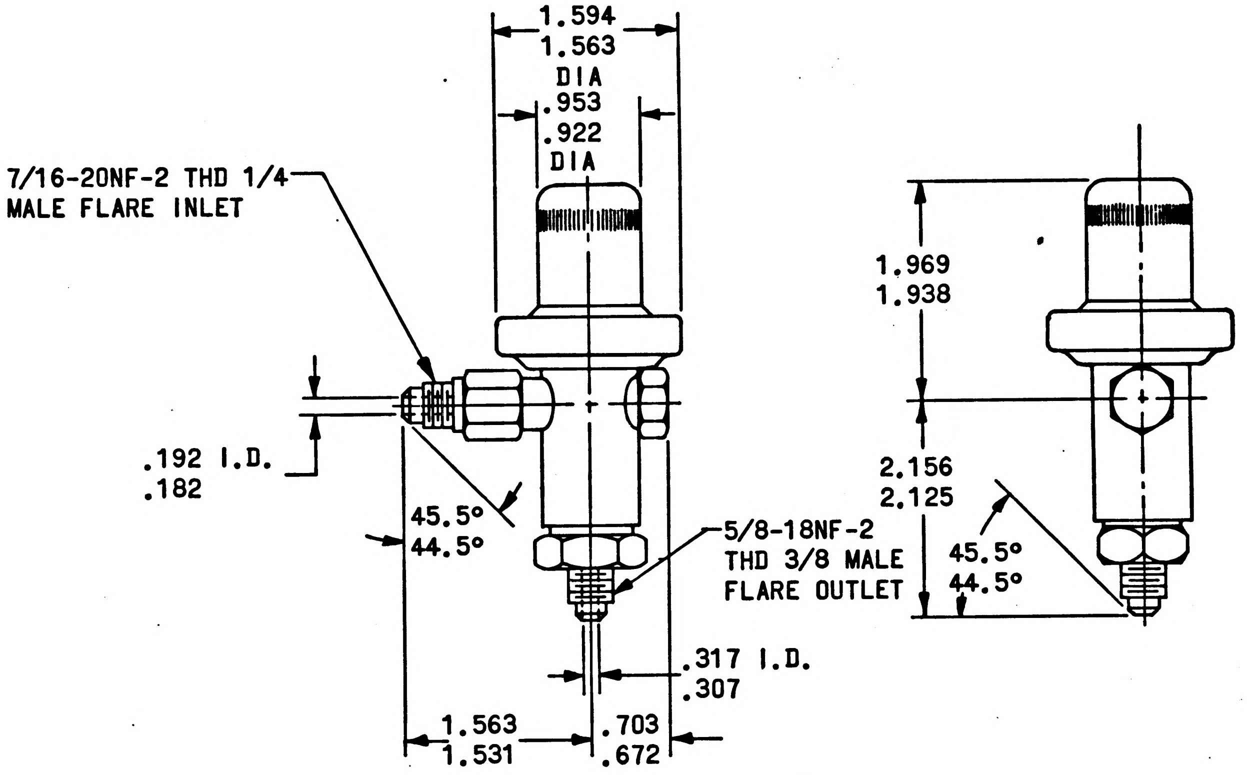
REVISIONS TDRR 19112			
SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) VALVE SEAT: STAINLESS STEEL
       - (b) VALVE BALL: STAINLESS STEEL
       - (c) VALVE SPRING: STAINLESS STEEL
       - (d) VALVE DIAPHRAGM: STAINLESS STEEL
       - (e) VALVE BODY: BRASS
     - (2) FINISH:
       - (a) STAINLESS STEEL PARTS: PASSIVATE
     - (3) MARKING:
       - (a) PIECEMARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER
         - DATE CODE, OR DATE OF MANUFACTURE.
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.



NASA DASH NUMBER	ADJUSTMENT RANGE	REFRIGERANT	NOMINAL CAPACITY (TONS)	MANUFACTURER'S PART NUMBER (REF.) MODEL DEVICE NO.
-001	15" HG VAC. TO 45 PSIG	FREON 12	1/2	204CB5 60061

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH SEE REQUIREMENTS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Splane DATE 15FEB65
CHECKED J. Stelma 16FEB65
APPROVAL 16FEB65
APPROVAL Yeliman 5/4/65
NASA APPROVAL A.C. Mut
MIT APPROVAL M.G. Murley 5-18-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VALVE, EXPANSION-AUTOMATIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.
SIZE C
NASA DRAWING NO. 1897204
SCALE NONE
WT
SHEET 1 OF 1

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 18777			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 22690	5 OCT 65	JWP W.D.

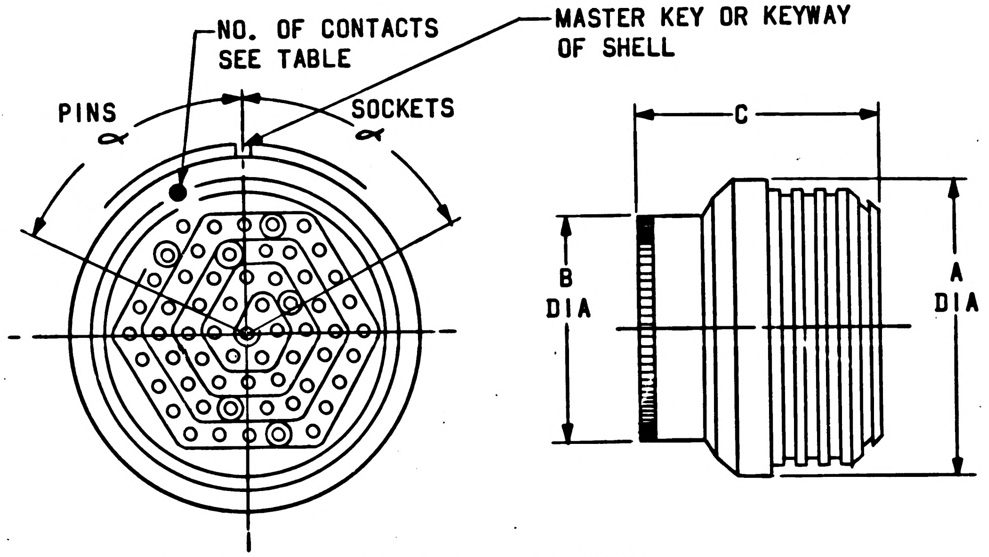
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE ENVIRONMENTAL REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP CONTACTS SHALL BE PER 1010770 OR 1897190.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY AS REQUIRED PER MIL-C-26482.
       - (b) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT, PLUS FLUORO-SILICONE RUBBER GROMMET. THIS MATERIAL SHALL BE NON-TOXIC OUTGASSING.
       - (c) GASKETS: SILICONE RUBBER
     - (2) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C, 500 VDC
5000 MEGOHMS AT 125°C, 500 VDC
     - (3) FINISH: SHELL; CLEAR CONDUCTIVE ANODIZED. FINISH SHALL BE NON-OUTGASSING.
     - (4) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER, AND DATE CODE OR DATE OF MANUFACTURE. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER AND REVISION LETTER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC
     - (3) WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 50 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM THE REAR OF PIN CONTACT CRIMP BARREL TO REAR OF SOCKET CONTACT CRIMP BARREL
     - (5) OPERATING TEMPERATURE: +125°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST.



NORMAL SOCKET CONTACT VIEW-PIN OPPOSITE
(FOR REF ONLY)
(GROMMET VIEW - REAR)

FIGURE I

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
NONE

FINAL FINISH
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. Contract NAS 9-497

DRAWN M. Gustin DATE 26-Nov-63
CHECKED Ed Foster 29 MAR 65
APPROVAL R. Trummer 29 Mar 65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL 5/4/65
MIT APPROVAL McMurley 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897207
SCALE NONE	WT	SHEET 1 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 18777			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 22690	5 OCT 65	JWP w.D

REQUIREMENTS: (CONTINUED)

B. MECHANICAL REQUIREMENTS:

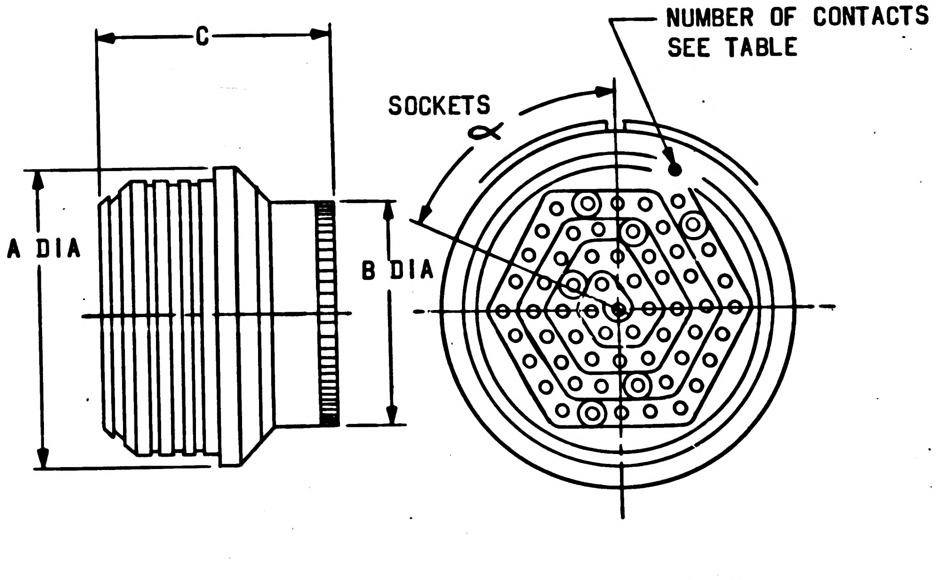
(1) COUPLING MECHANISM: PUSH PULL QUICK DISCONNECT.

(2) MAX ENGAGEMENT FORCE: MIN DISENGAGEMENT FORCE (WITH CONTACTS). PER TABLE.

(3) CONTACT RETENTION: 20 LBS. MIN IN DIRECTION OF MATING FORCE

(4) ALTITUDE IMMERSION: PER MIL-C-26500.

NASA DASH NUMBER			NO. OF CONTACTS	α IN DEGREES	DIMENSIONS			MAX ENG FORCE (LBS)	MIN DISENG FORCE (LBS)
SOCKET TYPE FIGURE II	SOCKET TYPE FIGURE I	PIN TYPE FIGURE I			A	B	C		
201	001	101	91	0	1.374 1.344	1.092 1.062	.843 .781	40	4.75
202	002	102		225					
203	003	103		150					
204	004	104		75					
205	005	105	61	0	1.214 1.184	.952 .922		35	3.75
206	006	106		225					
207	007	107		150					
208	008	108		75					
	009	109	37	0	1.078 1.048	.828 .797		25	2.80
	010	110		225					
	011	111		150					
	012	112		75					
	013	113	19	0	.930 .900	.703 .673		20	1.50
	014	114		225					
	015	115		150					
	016	116		75					
	017	117	7	0	.734 .704	.593 .563		20	1.50
	-	-		-					
	019	119		150					
	-	-		-					



REVERSE SOCKET CONTACT VIEW
(FOR REF. ONLY)
(GROMMET VIEW-REAR)
FIGURE II

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. FOR MATING HALF SEE DRAWING 1012151 AND 1897194.
2. FOR STRAIN RELIEF CLAMP SEE DRAWING 1010933.
3. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
4. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED α DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO Contract NAS 9-497

DRAWN M. Gerber DATE 25 MAR 65
CHECKED Ed Foster 29 MAR 65
APPROVAL R. Trummer 29 Mar 65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL 5/4/
MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897207
SCALE NONE	WT	SHEET 2 OF 2

AC

1897207

REVISIONS TDRR 18777

SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

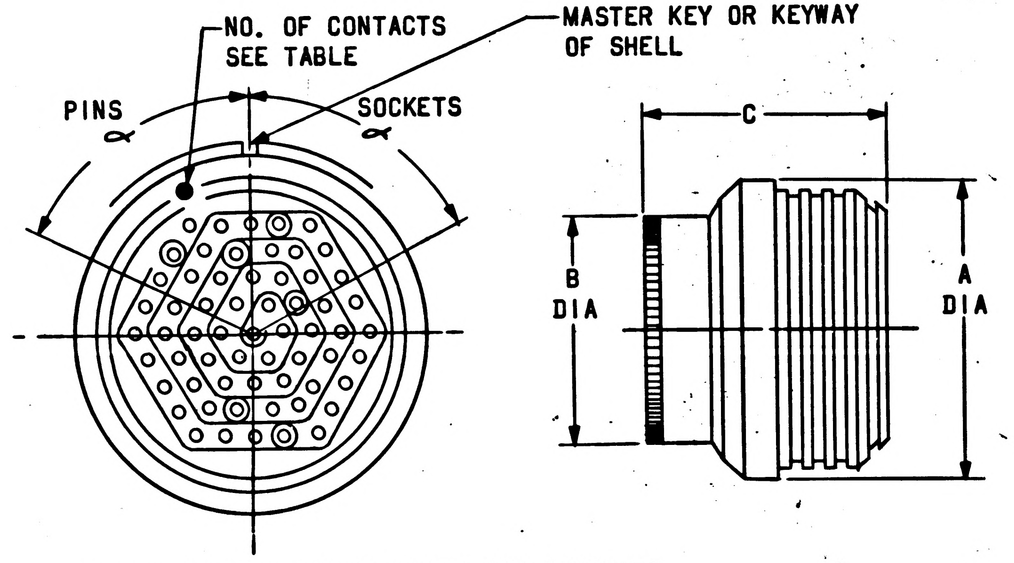
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE ENVIRONMENTAL REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP CONTACTS SHALL BE PER 1010770 OR 1897190.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY AS REQUIRED PER MIL-C-26482.
       - (b) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT, PLUS FLUORO-SILICONE RUBBER GROMMET. THIS MATERIAL SHALL BE NON-TOXIC OUTGASSING.
       - (c) GASKETS: SILICONE RUBBER
     - (2) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C, 500 VDC
5000 MEGOHMS AT 125°C, 500 VDC
     - (3) FINISH: SHELL; CLEAR CONDUCTIVE ANODIZED. FINISH SHALL BE NON-OUTGASSING.
     - (4) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER, AND DATE CODE OR DATE OF MANUFACTURE. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER AND REVISION LETTER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC
     - (3) WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 50 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM THE REAR OF PIN CONTACT CRIMP BARREL TO REAR OF SOCKET CONTACT CRIMP BARREL
     - (5) OPERATING TEMPERATURE: +125°C.

MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.



NORMAL SOCKET CONTACT VIEW-PIN OPPOSITE
(FOR REF ONLY)
(GROMMET VIEW - REAR)

FIGURE I

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±— DECIMALS ±— ANGLES ±—
DO NOT SCALE THIS DRAWING

MATERIAL: SEE REQUIREMENTS
HEAT TREATMENT: NONE
FINAL FINISH: SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497

DRAWN M. Gustner DATE 26-NOV 63
CHECKED Ed Foster 29 MAR 65
APPROVAL R. Trummer 29 Mar 65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL 5/4/65
MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897207
SCALE NONE
WT
SHEET 1 OF 2

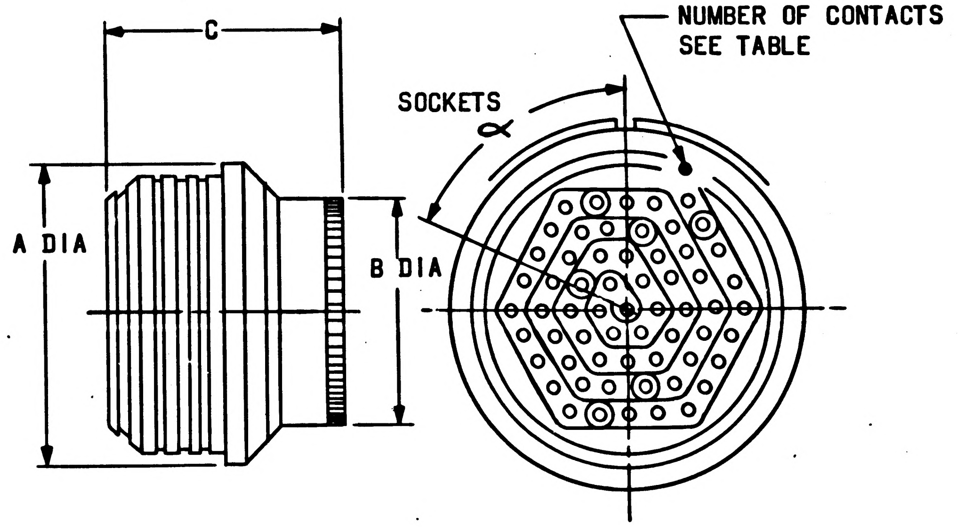
REVISIONS TDRR 18777			
SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS: (CONTINUED)

B. MECHANICAL REQUIREMENTS:
  (1) COUPLING MECHANISM: PUSH PULL QUICK DISCONNECT.
  (2) MAX ENGAGEMENT FORCE: MIN DISENGAGEMENT FORCE (WITH CONTACTS). PER TABLE.
  (3) CONTACT RETENTION: 20 LBS. MIN IN DIRECTION OF MATING FORCE
  (4) ALTITUDE IMMERSION: PER MIL-C-26500.

NASA DASH NUMBER			NO. OF CONTACTS	α IN DEGREES	DIMENSIONS			MAX ENG FORCE (LBS)	MIN DISENG FORCE (LBS)
SOCKET TYPE FIGURE II	SOCKET TYPE FIGURE I	PIN TYPE FIGURE I			A	B	C		
201	001	101	91	0				40	4.75
202	002	102		225	1.374	1.078			
203	003	103		150	1.344	1.048			
204	004	104		75					
205	005	105	61	0				35	3.75
206	006	106		225	1.202	.952			
207	007	107		150	1.172	.922			
208	008	108		75					
	009	109	37	0				25	2.80
	010	110		225	1.078	.828	.843		
	011	111		150	1.048	.797	.781		
	012	112		75					
	013	113	19	0				20	1.50
	014	114		225	.921	.703			
	015	115		150	.891	.673			
	016	116		75					
	017	117	7	0				20	1.50
	-	-		-	.734	.593	.826		
	019	119		150	.704	.563	.800		
	-	-		-					



REVERSE SOCKET CONTACT VIEW
(FOR REF. ONLY)
(GROMMET VIEW-REAR)
FIGURE II

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. FOR MATING HALF SEE DRAWING 1012151 AND 1897194.
2. FOR STRAIN RELIEF CLAMP SEE DRAWING 1010933.
3. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
4. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED α DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497
DRAWN M. Grabner DATE 25-MAR-65
CHECKED Ed Foster 29 MAR 65
APPROVAL R. Trummer 29 Mar 65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL
MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897207
SCALE NONE
WT
SHEET 2 OF 2

AC

1897211 D

NOTICE -- WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

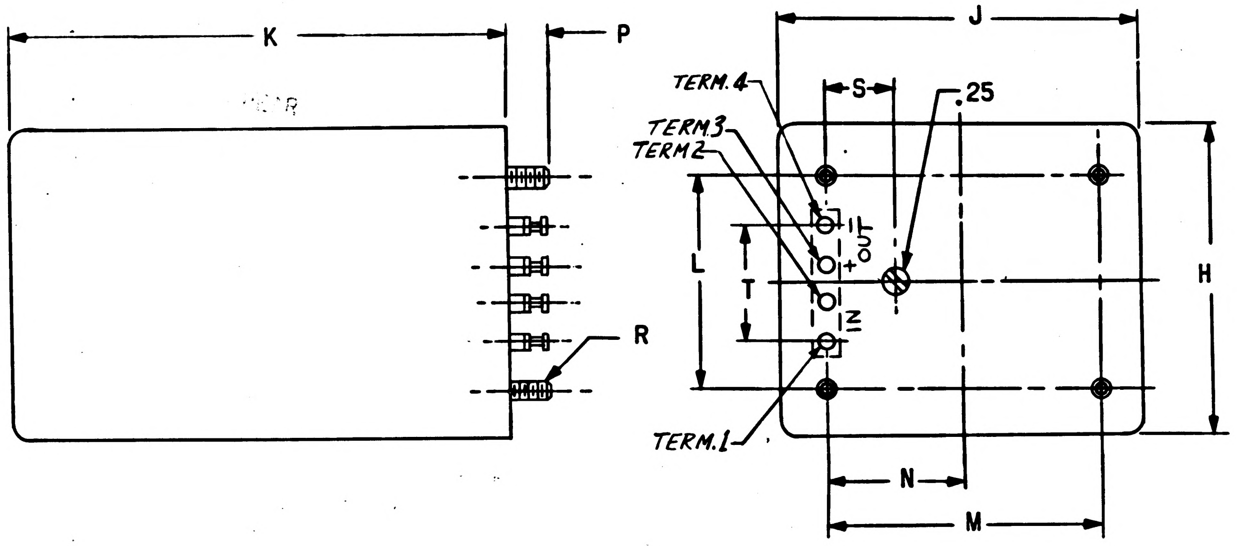
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 201924	16 JUN 65	JRS WD
B	REVISED PER MXC 203413	30 JUL 65	LK RWH
C	REVISED PER MXC 206231	19 OCT 65	HTO
D	INITIAL RELEASE CLASS A PER TDRR 23555	20 OCT 65	RTD CW

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. CHANGES IN MODULE FUNCTION OR DIMENSIONS ARE SUBJECT TO APPROVAL BY THE PROCURING ACTIVITY.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL:
     - (1) PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND-1002019 WITH THE NASA DRAWING NUMBER AND DASH NUMBER. TERMINAL (IN-OUT) MARKING SHALL APPEAR ON PART. MANUFACTURER'S PART NUMBER MAY APPEAR ON PART.
     - (2) MODULE DIMENSIONS PER TABLE I
   - B. ELECTRICAL REQUIREMENTS: PER TABLE II
     - (1) OUTPUT VOLTAGE RANGE
     - (2) OUTPUT CURRENT

3. DESIGN REQUIREMENTS:
   - A. ENVIRONMENTS: UNITS SHALL BE CAPABLE OF WITHSTANDING WITHOUT BREAKDOWN AND BE CAPABLE OF PROPER OPERATION DURING AND/OR AFTER THE FOLLOWING ENVIRONMENTS PER MIL-E-5272
     - (1) HUMIDITY: 5 CYCLES NON-OPERATING
     - (2) TEMPERATURE: OPERATING -20°C TO +71°C
NON-OPERATING -62°C TO +85°C
     - (3) SHOCK: 20G AT 11 ± 1 MILLISECOND NON-OPERATING
   - B. ELECTRICAL SPECIFICATIONS.
     - (1) REGULATION: ± 0.5%
     - (2) RIPPLE: LESS THAN 0.01% OR 5 MV RMS (WHICHEVER IS GREATER) WITH 60 CPS INPUT. LESS THAN 0.04% OR 10 MV RMS (WHICHEVER IS GREATER) WITH 400 CPS INPUT.
     - (3) TEMPERATURE COEFICIENT: 0.015% /°C TYP
     - (4) PER TABLE II
   - C. EXTERNAL CONECTIONS (REF): TERMINAL 1, TERMINAL 2 } INPUT
TERMINAL 3 OUTPUT +
TERMINAL 4 OUTPUT -
   - D. ALL TERMINALS ARE ELECTRICALLY ISOLATED FROM CASE.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER'S LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Grabner DATE 19-MAR-65
CHECKED A. Udovich 24 MAR 65
APPROVAL D.W. Hutchins 24 MAR 65
APPROVAL J. M. Watson 10-28-65
NASA APPROVAL
MIT APPROVAL 29 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER MODULE, SOLID STATE
SPECIFICATION CONTROL DWG.

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897211
SCALE NONE
WT
SHEET 1 OF 2

1897211

NOTICE -- WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS. SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION. OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE. USE. OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 201924	16 JUN 65	JRS W.D.
B	REVISION STATUS CHANGED	30 JUL 65	LK RWH
C	REVISION STATUS CHANGED	19 OCT 65	HTO
D	INITIAL RELEASE CLASS A PER TDRR 23555	20 OCT 65	RTP CW

TABLE I
MODULE DIMENSIONS

NASA DASH NUMBER	H	J	K	L	M	N	P	R	S	T
-001	$2.62^{+.00}_{-.12}$	$3.06^{+.00}_{-.12}$	$4.25^{+.06}_{-.19}$	1.859 ± .016	2.297 ± .016	1.156 ± .016	.34 ± .06	8-32	.594 ± .016	.938
-002	$4.00^{+.00}_{-.12}$	$4.69^{+.00}_{-.12}$	$6.00^{+.06}_{-.19}$	3.000 ± .047	3.688 ± .047	1.844 ± .047	.56 ± .06	1/4-20	.594 ± .047	.938
-003	$3.69^{+.00}_{-.12}$	$4.31^{+.00}_{-.12}$	$5.56^{+.06}_{-.19}$	2.688 ± .031	3.312 ± .031	1.656 ± .031	.44 ± .06	10-32	.594 ± .031	.938
-004	$3.06^{+.00}_{-.12}$	$3.56^{+.00}_{-.12}$	$4.87^{+.06}_{-.19}$	2.125 ± .016	2.625 ± .016	1.312 ± .016	.34 ± .06	8-32	.594 ± .016	.938

TABLE II

NASA DASH NUMBER	OUTPUT VOLTAGE RANGE		INPUT VOLTAGE RANGE VOLTS		INPUT FREQUENCY RANGE CYCLES		OUT CURRENT AMPS
	MIN	MAX	MIN	MAX	MIN	MAX	TYP
-001	11.4	12.5	105	125	50	400	0.200
-002	11.4	12.5	105	125	50	400	1.50
-003	192	210	105	125	50	400	0.100
-004	29.2	32.7	105	125	50	400	0.375

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Grubner DATE 19-MAR 65
CHECKED A. Udovich 24 MAR 65
APPROVAL J. W. Hutchins 24 MAR 65
APPROVAL J M Watson 10-28-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER MODULE, SOLID STATE
SPECIFICATION CONTROL DWG.

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897211
SCALE NONE
WT
SHEET 2 OF 2

1897212 A

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER. AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

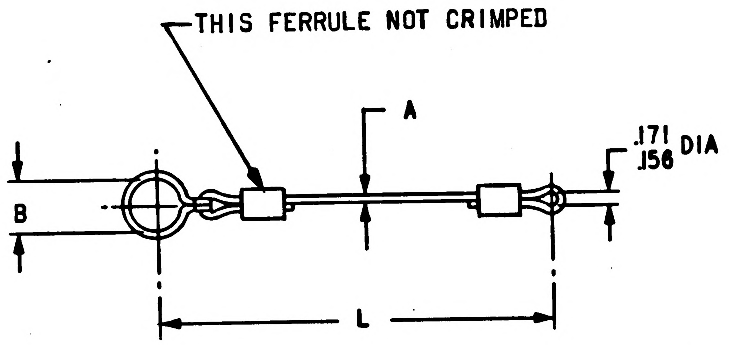
REVISIONS TORR 18776			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TORR 21955	31AUG65	JW

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL AND FINISH:
       - (a) CABLE: NYLON COVERED STEEL PER MIL-C-5424 AND MIL-C-1511.
       - (b) FERRULES: COPPER, ZINC PLATED.
       - (c) WIRE LOOP: SPRING STEEL WIRE, BLACK OXIDE FINISH PER MIL-C-13924.

NASA DASH NUMBER	L (INCHES)	CABLE DIA A	RING I.D. B	BREAKING STRENGTH IN POUNDS	MANUFACTURER'S PART NUMBER (FOR REF)
-1	2.1 1.9	.073 .063	.280 .250	360	
-2	2.6 2.4	↓	↓		
-3	3.1 2.9	↓	↓		
-4	3.6 3.4	↓	↓		
-5	4.1 3.9	↓	↓		
-6	3.1 2.9	.050 .040	.342 .312	80	
-7	3.6 3.4	↓	↓		
-8	4.1 3.9	↓	↓		
-9	3.6 3.4	↓	.280 .250		



1897212

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH SEE REQUIREMENTS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
Contract NAS 9-497
DWG. NO.
DRAWN Janowiak DATE 23 MAR 65
CHECKED Ed Foster 25 MAR 65
APPROVAL J. V. Wear 25 MAR 65
APPROVAL J. M. Watton 4-26-65
NASA APPROVAL 5/4/65
MIT APPROVAL M. J. Murley 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NYLON ROPE ASSEMBLY, SINGLE LEG

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897212
SCALE —
WT
SHEET 1 OF 1

PROCURE ONLY FROM APPROVED SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST.

AC

1897212

REVISIONS TDRR 18776

SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

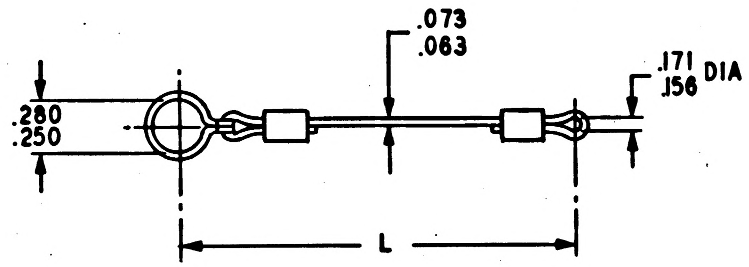
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL AND FINISH:
       - (a) CABLE: NYLON PER MIL-C-5424.
       - (b) FERRULES: COPPER, ZINC PLATED.
       - (c) WIRE LOOP: SPRING STEEL WIRE, BLACK OXIDE FINISH PER MIL-C-13924.

NASA DASH NUMBER	L (INCHES)	MANUFACTURER'S PART NUMBER (FOR REF)
-1	2.1 1.9	CL-42-KA-2.0-4L
-2	2.6 2.4	CL-42-KA-2.5-4L
-3	3.1 2.9	CL-42-KA-3.0-4L
-4	3.6 3.4	CL-42-KA-3.5-4L
-5	4.1 3.9	CL-42-KA-4.0-4L

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
NONE

FINAL FINISH
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497

DRAWN Janowiak DATE 23 MAR 65
CHECKED Ed Foster 25 MAR 65
APPROVAL J. V. Wean 25 MAR 65
APPROVAL J. M. Walton 4-26-65
NASA APPROVAL
MIT APPROVAL M. J. Murley 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NYLON ROPE ASSEMBLY, SINGLE LEG

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897212
SCALE —
WT
SHEET 1 OF 1

AC

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897213

REVISIONS TDRR 18772			
SYM	DESCRIPTION	DATE	APPROVAL
	INITIAL RELEASE CLASS A PER TDRR		

REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   C. PARTS SHALL BE PACKAGED WITH CONTAINERS PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, QUANTITY OF PARTS, DATE CODE OR DATE OF MANUFACTURE, PLUS NASA DRAWING AND DASH NUMBER.

2. INSPECTION AND ACCEPTANCE:
   A. MECHANICAL REQUIREMENTS:
      (1) MATERIAL:
         (a) PIN CONTACTS: NO.16 AND 22: GRADE C COIN SILVER, HARD TEMPER PER MIL-S-13282.
         (b) SOCKET CONTACTS:
            NO.16: BERYLLIUM COPPER, BERYLCO NO.10, (SHELL-HALF HARD BRASS)
            NO.22: LEADED COPPER (SPRING-BERYLLIUM COPPER, HALF HARD PER QQ-C-533)
      (2) FINISH:
         (a) PIN CONTACTS: GOLD PLATE PER MIL-G-45204 TYPE II, CLASS I.
         (b) SOCKET CONTACTS AND SHELL: GOLD PLATE PER MIL-G-45204 TYPE II, CLASS II.
      (3) SOCKET INSERTION AND WITHDRAWAL: NO.22 AWG .0316 PIN .3 LBS., .0308 PIN .015 LBS. NO.16 AWG .0622 PIN .72 LBS., .0611 PIN .10 LBS.

3. DESIGN:
   A. ELECTRICAL REQUIREMENTS:
      (1) CONTACT CURRENT RATING PER TABLE I
      (2) CONTACT RESISTANCE: 15 MILLIVOLTS AT 5 AMP. DASH 1 MATED WITH DASH 3 OR DASH 2 MATED WITH DASH 4. SEE NOTE 4.
      (3) CONTACTS MAY BE USED WITH CONNECTORS 1897179 AND 1897180.
      (4) CONTACT RESISTANCE: 15 MILLIVOLTS AT 250 MICRO AMPERES.

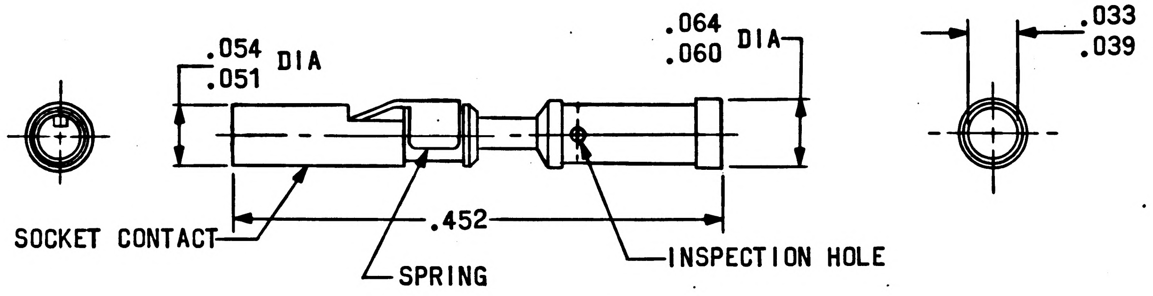


FIGURE 1 SEE NOTE 3

NOTES:
1. PARTS SHALL BE BAGGED AND TAGGED.
2. CONTACT FOR USE WITH NO.16 OR 18 AWG STRANDED WIRE.
3. CONTACT FOR USE WITH NO.22 OR 24 AWG STRANDED WIRE.
4. WHEN MEASURED IN ACCORDANCE WITH MIL-C-26482.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL: SEE REQUIREMENTS
HEAT TREATMENT: NONE
FINAL FINISH: SEE REQUIREMENTS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497

DRAWN M. Imbree DATE 23 MAR 65
CHECKED J. GRIEB 30 MAR 65
APPROVAL R. Trummer 30 Mar 65
APPROVAL J. M. Watson 4-27-65
NASA APPROVAL 5/4/65
MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897213
SCALE NONE	WT	SHEET 1 OF 2

AC

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897213

REVISIONS TDRR 18772

SYM	DESCRIPTION	DATE	APPROVAL
	INITIAL RELEASE CLASS A PER TDRR		

TABLE I

NASA DASH NUMBER	FIGURE NO.	CONTACT	CONTACT SIZE	WIRE, AWG ACCOMMODATION	CURRENT RATING
-001	FIGURE 1	SOCKET	22	22-24	5 AMPS
-002	FIGURE 2	SOCKET	16	16-18	20 AMPS
-003	FIGURE 3	PIN	22	22-24	5 AMPS
-004	FIGURE 4	PIN	16	16-18	20 AMPS

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

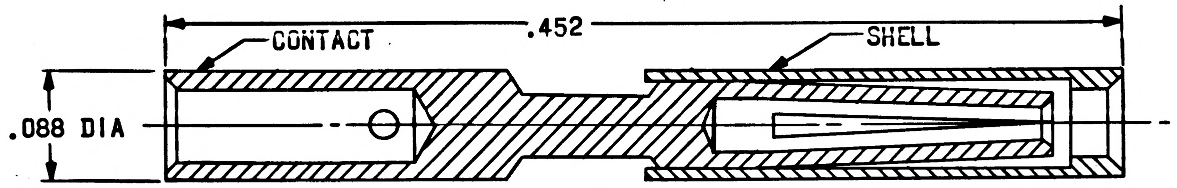


FIGURE 2 SEE NOTE 2

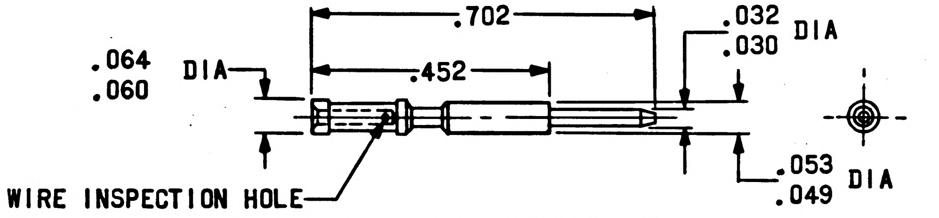


FIGURE 3 SEE NOTE 3

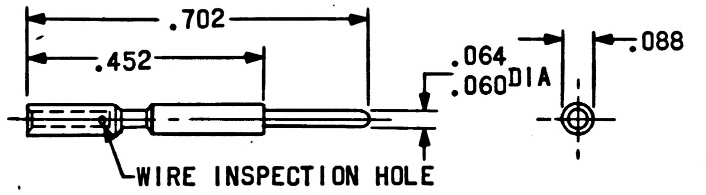


FIGURE 4 SEE NOTE 2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497

DRAWN M. Gruber DATE 25-MAR 65
CHECKED J. GRIEB 30 MAR65
APPROVAL R. Trummer 30 Mar 65
APPROVAL J M. Watson 4-27-65
NASA APPROVAL 5/4/65
MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897213
SCALE
WT
SHEET 2 OF 2

Ae

1897214

SYM	REVISIONS TDRR 18773 DESCRIPTION	DATE	APPROVAL

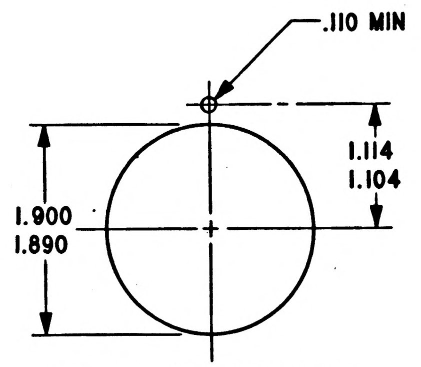
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

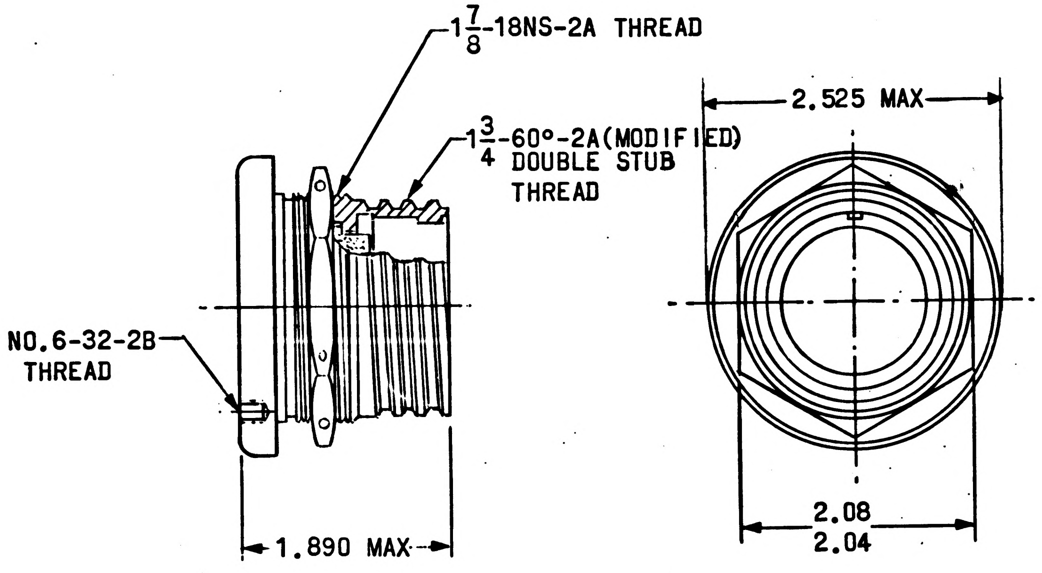
1. GENERAL:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
    - A. CONTACTS: INSPECT PER 1016369.
    - B. MARKING:
        - (1) PIECEMARKING: PART SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, THE NASA DRAWING NUMBER AND DASH NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
        - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER AND DASH NUMBER, AND THE DATE CODE OR DATE OF MANUFACTURE. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.
3. DESIGN:
    - A. MATERIAL:
        - (1) SHELL AND HEX NUT: ALUMINUM ALLOY, HIGH STRENGTH PER MIL-C-26482.
        - (2) INSERT: SOLID DIELECTRIC, DIALLYL PHTHALATE PER MIL-M-19833, TYPE GDI-30.
    - B. FINISH:
        - (1) SHELL: NON-CONDUCTIVE ANODIZE FINISH - OLIVE DRAB COLOR.
    - C. CONTACTS: USES 55 AC OR COAXIAL PIN OR SOCKET CRIMP CONTACTS PER 1016369.
    - D. DESIGNED FOR 750 VOLTS AC, MAX, OR COAXIAL APPLICATIONS.

NOTES:

1. CONTACTS MUST BE ORDERED SEPARATELY PER 1016369.
2. SPECIAL TOOLING REQUIRED FOR CRIMPING, INSERTION AND REMOVAL OF THE CONTACTS.
3. ALTERNATE INSERT POSITIONS: THE INSERT IS ROTATED THE SPECIFIED NUMBER OF DEGREES RELATIVE TO THE ℄ OF THE MASTER KEYWAY. INSERT ROTATED CLOCKWISE FOR SOCKET CONTACTS, COUNTERCLOCKWISE FOR PIN CONTACTS. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY THE USER.
4. FOR MATING CONNECTOR SEE 1897215.



PANEL CUTOUT DIMENSIONS
(FOR REFERENCE)



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. Contract NAS 9-497
DRAWN Janowiak DATE 29 MAR 65
CHECKED W. Diehl 31 Mar '65
APPROVAL R. Trumner 31 Mar '65
APPROVAL J. M. Watson 5-4-65
NASA APPROVAL R. C. M 5/4/65
MIT APPROVAL M G Murley 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL - PANEL MOUNTING (SHELL SIZE 28)

SPECIFICATION CONTROL DRAWING

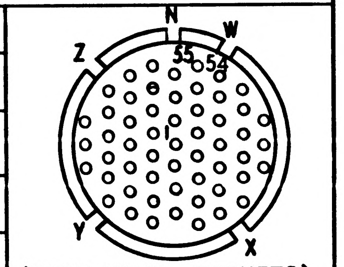
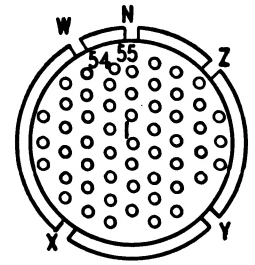
CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897214
SCALE NONE
WT
SHEET 1 OF 2

AC

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897214

REVISIONS TDRR 18773			
SYM	DESCRIPTION	DATE	APPROVAL

NASA DASH NUMBER	CONTACT TYPE	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT POSITION (SEE NOTE 3)	
-001	SOCKET	MA-28C-97-S-4-N-K22	N(0°)	 (FACE VIEW - SOCKETS)
-002		MA-28C-97-S-4-W-K22	W(30°)	
-003		MA-28C-97-S-4-X-K22	X(142°)	
-004		MA-28C-97-S-4-Y-K22	Y(226°)	
-005		MA-28C-97-S-4-Z-K22	Z(314°)	
-011	PIN	MA-28C-97-P-4-N-K22	N(0°)	 (FACE VIEW - PINS)
-012		MA-28C-97-P-4-W-K22	W(30°)	
-013		MA-28C-97-P-4-X-K22	X(142°)	
-014		MA-28C-97-P-4-Y-K22	Y(226°)	
-015		MA-28C-97-P-4-Z-K22	Z(314°)	

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. Contract NAS 9-497
DRAWN Janowiak DATE 29 MAR 65
CHECKED W. Diehl 31 Mar '65
APPROVAL R. Trummer 31 Mar 65
APPROVAL J M Watson 5-4-65
NASA APPROVAL 5/4/65
MIT APPROVAL M T Murphy 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL - PANEL MOUNTING (SHELL SIZE 28)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897214
SCALE
WT
SHEET 2 OF 2

AC

1897214

1897215

REVISIONS TDRR 18772			
SYM	DESCRIPTION	DATE	APPROVAL

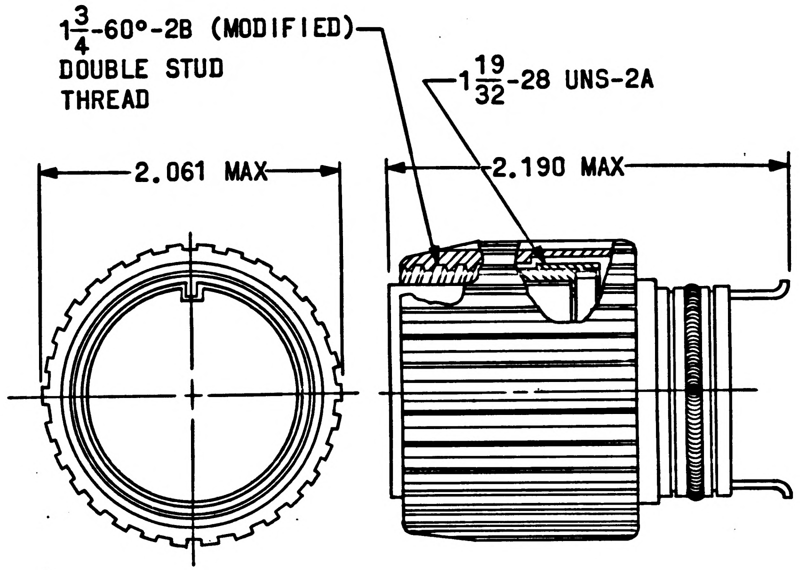
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   A. ELECTRICAL REQUIREMENTS:
      (1) CONTACTS: INSPECT PER 1016369
   B. MECHANICAL REQUIREMENTS:
      (1) MARKING:
         (a) PIECEMARKING: PART SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, THE NASA DRAWING NUMBER AND DASH NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
         (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA DRAWING NUMBER AND DASH NUMBER, AND THE DATE CODE OR DATE OF MANUFACTURE. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   A. MECHANICAL REQUIREMENTS:
      (1) MATERIAL:
         (a) SHELL, COUPLING NUT AND STRAIN RELIEF CLAMP: ALUMINUM ALLOY, HIGH STRENGTH PER MIL-C-26482.
         (b) INSERT: SOLID DIELECTRIC, DIALLYLPHTHALATE PER MIL-M-19833, TYPE GDI-30.
      (2) FINISH:
         (a) SHELL: NON-CONDUCTIVE ANODIZE FINISH-OLIVE DRAB COLOR.
   B. ELECTRICAL REQUIREMENTS:
      (1) CONTACTS: USES 55 AC OR COAXIAL PIN OR SOCKET CRIMP CONTACTS PER 1016369.
      (2) DESIGNED FOR 750 VOLTS AC, MAX, OR COAXIAL APPLICATIONS.


$1\frac{3}{4}$-60°-2B (MODIFIED) DOUBLE STUD THREAD
$1\frac{19}{32}$-28 UNS-2A
2.061 MAX
2.190 MAX

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH SEE REQUIREMENTS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497
DRAWN M. Gubra DATE 29 MAR 65
CHECKED C. Wilson 30 MAR 65
APPROVAL R. Trummer 30 Mar 65
APPROVAL J. M. Watson 4-27-65
NASA APPROVAL G. C. Metz 5/4/65
MIT APPROVAL W. F. Murley 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL
(SHELL SIZE 28)

SPECIFICATION CONTROL DRAWING

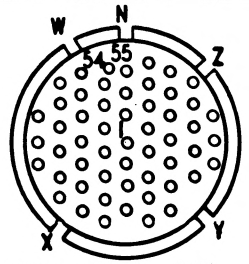
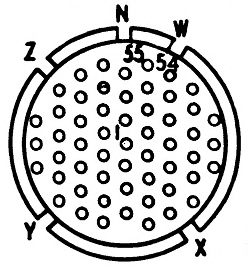
CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897215
SCALE NONE	WT	SHEET 1 OF 2

AC

1897215

REVISIONS TDRR 18772			
SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NASA DASH NUMBER	CONTACT	MANUFACTURER'S IDENTIFICATION (SEE NOTE 4)	INSERT ARRANGEMENT (FOR REF ONLY) POSITION (SEE NOTE 3)	
-001	PINS	MA-28C-97-P-6-N-K22	N (0°)	
-002		MA-28C-97-P-6-W-K22	W (30°)	
-003		MA-28C-97-P-6-X-K22	X (142°)	
-004		MA-28C-97-P-6-Y-K22	Y (226°)	
-005		MA-28C-97-P-6-Z-K22	Z (314°)	
				(FACE VIEW - PINS)
-011	SOCKETS	MA-28C-97-S-6-N-K22	N (0°)	
-012		MA-28C-97-S-6-W-K22	W (30°)	
-013		MA-28C-97-S-6-X-K22	X (142°)	
-014		MA-28C-97-S-6-Y-K22	Y (226°)	
-015		MA-28C-97-S-6-Z-K22	Z (314°)	
				(FACE VIEW - SOCKETS)

THE PART NUMBER IS THE DRAWING NUMBER
PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. CONTACTS MUST BE ORDERED SEPARATELY PER 1016369.
2. SPECIAL TOOLING REQUIRED FOR CRIMPING, INSERTION AND REMOVAL OF THE CONTACTS.
3. ALTERNATE INSERT POSITIONS: THE INSERT IS ROTATED THE SPECIFIED NUMBER OF DEGREES RELATIVE TO THE ℄ OF THE MASTER KEYWAY. INSERT ROTATED CLOCKWISE FOR SOCKET CONTACTS, COUNTERCLOCKWISE FOR PIN CONTACTS. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY THE USER.
4. FOR MATING CONNECTOR SEE 1897214

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497

DRAWN M. Graber DATE 29-MAR 65
CHECKED C. Wilson 30 MAR 65
APPROVAL R. Trummer 30 Mar 65
APPROVAL J. M. Watson 4-27-65

NASA APPROVAL

MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL
(SHELL SIZE 28)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897215
SCALE	WT	SHEET 2 OF 2

AC

NOTICE - WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

1897222 A

REVISIONS TDRR 18772

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC-201865 TDRR 31496	10 JUN 65	JRS

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. THIS UNIT SHALL MEET ALL APPLICABLE PARAGRAPHS OF MIL-R-5757 WITH THE FOLLOWING QUALIFICATIONS.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - (a) MANUFACTURER'S NAME OR SYMBOL.
       - (b) MANUFACTURER'S PART NUMBER.
       - (c) NASA DRAWING NUMBER AND DASH NUMBER.
       - (d) RATED COIL VOLTAGE.
       - (e) DATE CODE.
       - (f) COIL RESISTANCE.
       - (g) CIRCUIT DIAGRAM
   - B. ELECTRICAL REQUIREMENTS:
     - (1) PULL-IN VOLTAGE: SEE TABLE I.
     - (2) DROP-OUT VOLTAGE: SEE TABLE I.
     - (3) CONTACT RESISTANCE: (100% INSPECTION) .05 OHM MAXIMUM BEFORE AND DURING LIFE (.10 OHMS MAXIMUM AFTER LIFE) WHEN MEASURED WITH 100 MILLIAMPS FROM A SIX (6) VOLT DC SOURCE. (THE CONTACTS SHALL NOT SWITCH THE MEASURING LOAD).
     - (4) DIELECTRIC STRENGTH: SHALL WITHSTAND FOR ONE MINUTE THE FOLLOWING POTENTIALS AT THE INDICATED LEVELS, WITHOUT ARCING, DAMAGE, OR BREAKDOWN.
       - (a) SEA LEVEL: 1000 VOLTS RMS 60 CPS BETWEEN,
         CONTACT TERMINALS AND COIL TERMINALS,
         CONTACT TERMINALS AND CASE,
         CIRCUITS.
       - (b) SEA LEVEL: 500 VOLTS RMS 60 CPS BETWEEN,
         OPEN CONTACT TERMINALS OF EACH CIRCUIT (RELAY BOTH ENERGIZED AND DEENERGIZED)
         COIL TERMINALS AND CASE.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM, USING A 500 VOLT DC TEST POTENTIAL APPLIED BETWEEN
       - (a) COIL TERMINALS, COMMONLY CONNECTED, AND CASE
       - (b) EACH NORMALLY OPEN CONTACT AND CASE
       - (c) EACH MOVABLE, OR "COMMON", CONTACT AND CASE (WITH COIL DEENERGIZED)
       - (d) ALL CONTACT TERMINALS, COMMONLY CONNECTED, AND THE COIL TERMINALS.
     - (6) OPERATE TIME: 5 MILLISECONDS MAXIMUM OVER THE AMBIENT TEMPERATURE RANGE.
     - (7) RELEASE TIME: 5 MILLISECONDS MAXIMUM OVER THE AMBIENT TEMPERATURE RANGE.
     - (8) CONTACT BOUNCE TIME: 2 MILLISECONDS MAXIMUM OVER THE AMBIENT TEMPERATURE RANGE. (CONTACT BOUNCE TIME IS NOT TO BE INCLUDED IN OPERATE AND RELEASE TIME).

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

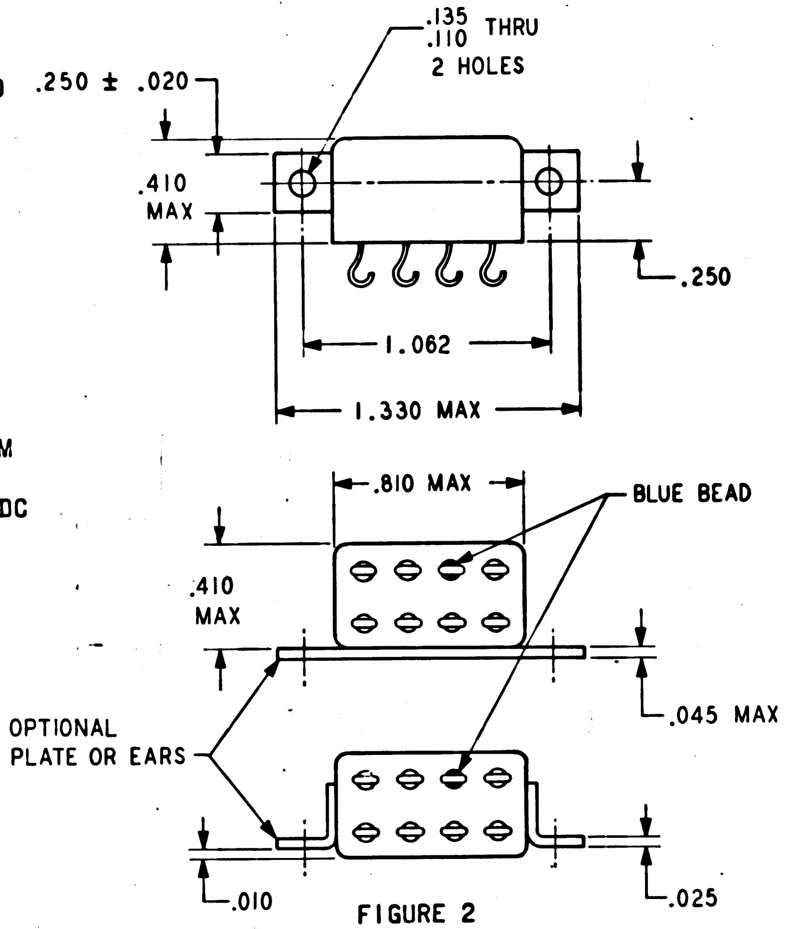


FIGURE 2

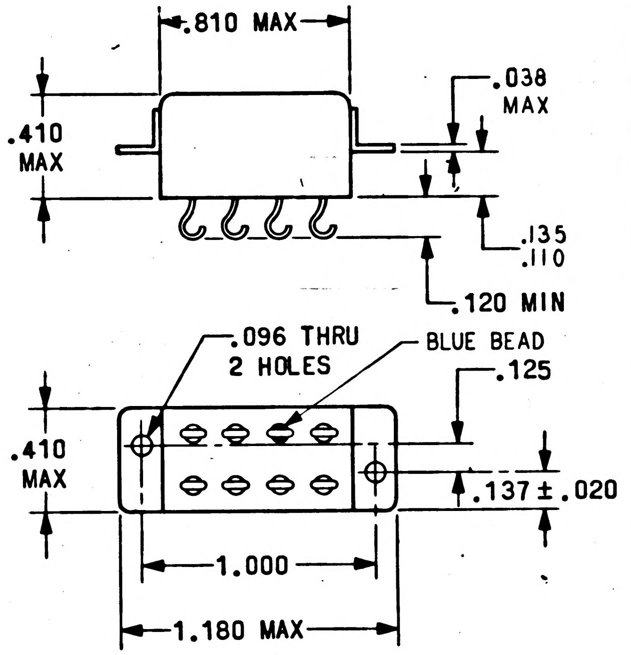


FIGURE 1

SHEET 1	SHEET 2	SHEET 3

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± –   DECIMALS ±.010   ANGLES ± –
DO NOT SCALE THIS DRAWING
MATERIAL NONE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO   Contract NAS 9-497
DRAWN Bender DATE 29-MAR-65
CHECKED
APPROVAL Kiwi Ninal 21 Mar 65
APPROVAL J. M. Watson 4-27-65
NASA APPROVAL
MIT APPROVAL 5 4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(GENERAL PURPOSE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897222
SCALE NONE
WT.
SHEET 1 OF 3

AC

1897222

REVISIONS 18772			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 201865 TDRR 31496	10 JUN 65	JRS

NOTICE — WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REQUIREMENTS: (CONTINUED)

3. DESIGN:
   - A. AMBIENT TEMPERATURE RANGE: -65°C TO +125°C.
   - B. COIL RESISTANCE: SEE TABLE I.
   - C. LIFE: WHEN TESTED AT ANY OF THE ABOVE RATINGS, OR BETWEEN THE MAXIMUM RATING AND THE MINIMUM RATING, FOR 100,000 CYCLES, OVER THE AMBIENT TEMPERATURE RANGE, THERE SHALL BE NO CONTACT RESISTANCE READING GREATER THAN 1 OHM DURING ANY CYCLE.
   - D. TERMINAL STRENGTH: 3 LBS MINIMUM AXIAL PULL.
   - E. SEALING: SEAL TEST III EXCEPT THE MAXIMUM LEAK RATE SHALL BE 10^{-8} cc/SEC.
   - F. ENVIRONMENTAL LEVELS:
     - (1) TEMPERATURE:
       - (a) HIGH: +125°C.
       - (b) LOW: -65°C.
     - (2) THERMAL SHOCK: -65°C TO +125°C.
     - (3) VIBRATION: 10-2000 CPS, 20 G.
     - (4) SHOCK: 50 G, 11 MILLISECONDS.
     - (5) ACCELERATION: 20 G.
     - (6) ALTITUDE: 70,000 FEET.
     - (7) HUMIDITY: 10 CYCLES.
   - G. CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (2 PDT).
   - H. CONTACT RATINGS: PER TABLE II.
   - J. COIL DISSIPATION: 1.5 WATTS MAX AT +125°C.
   - K. COIL VOLTAGE: SEE TABLE I.

4. SPECIAL CONDITIONING:
   - A. MISS TEST:
     - (1) THE MANUFACTURER SHALL SUBJECT ALL RELAYS TO 5000 OPERATIONS UNDER THE FOLLOWING CONDITIONS:
       - (a) 30 MICROAMPERES MAXIMUM CURRENT.
       - (b) 50 MILLIVOLTS MAXIMUM VOLTAGE.
       - (c) 50 OHMS MAXIMUM CONTACT RESISTANCE PER CONTACT PAIR.
       - (d) RATED COIL VOLTAGE APPLIED.
       - (e) 5 CPS MAXIMUM SWITCHING SPEED.
     - (2) CONTACT RESISTANCE, PULL-IN AND DROP-OUT VOLTAGE SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED TO THE USER. THE MANUFACTURER SHALL ALSO FURNISH THE USER A TABULATION SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5000 CYCLE TEST, THE NUMBER OF RELAYS FAILING DURING THE 5000 CYCLE TEST AND THE TIME OR CYCLE TO FAILURE. ONE COPY OF THIS INFORMATION SHALL BE FURNISHED WITH EACH SHIPMENT OF PARTS.

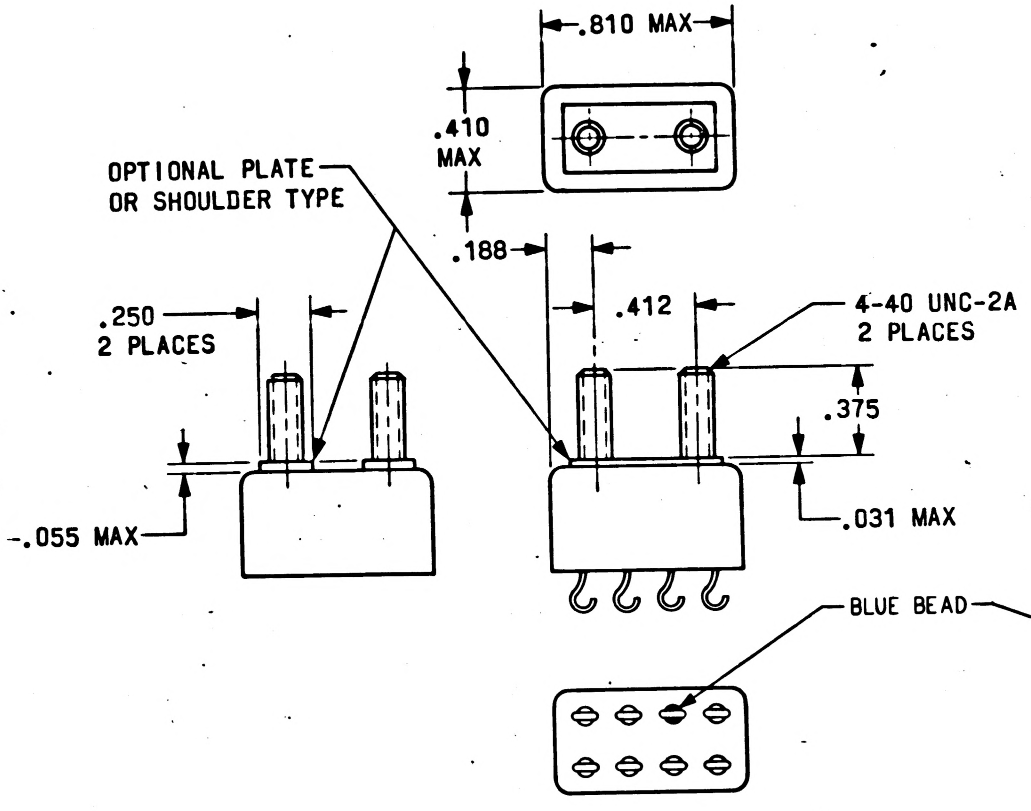


FIGURE 4

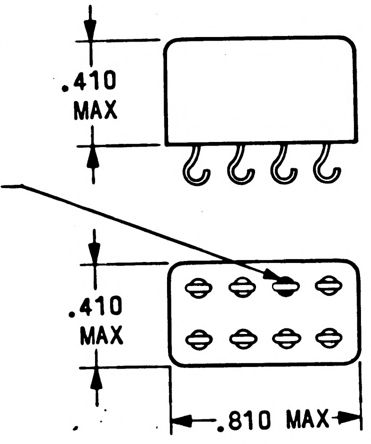


FIGURE 3

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO Contract NAS 9-497
DRAWN Bender DATE 29-MAR-65
CHECKED
APPROVAL
APPROVAL 4-27-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(GENERAL-PURPOSE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897222
SCALE —
WT
SHEET 2 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

1897222 A

REVISIONS TDRR 16772

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC-201865 TDRR 31496	10 JUN 65	JRS

TABLE I

NASA DASH NUMBER	FIGURE NO.	NOMINAL RATED COIL VOLTAGE (VOLTS DC)	PULL-IN VOLTAGE (VOLTS DC) MAX (OVER AMBIENT TEMP RANGE)	MINIMUM (AT +25°C)	MIN (OVER AMBIENT TEMP RANGE)	DROP-OUT VOLTAGE (VOLTS DC) MAX (OVER AMBIENT TEMP RANGE)	MIN (OVER AMBIENT TEMP RANGE)	COIL RESISTANCE RANGE AT +25°C (OHMS)
-1	1	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-2	2	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-3	3	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-4	4	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-5	1	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-6	2	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-7	3	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-8	4	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-9	5	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-10	5	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

TABLE II

	28 VDC	115 VRMS, 60 CPS	115 VRMS, 400 CPS	115/200 VRMS, 60 CPS	115/200 VRMS, 400 CPS
RESISTIVE	2.0	1.0	1.0	0.5	0.75
INDUCTIVE	0.5	0.5	0.75	0.5	0.75
LAMP	0.5	0.5	0.5	0.3	0.3
MINIMUM	0.1	—	—	—	—

SEE NOTE 2

SEE NOTE 1

NOTES:

1. INDUCTIVE LOAD LIMITED BY $\leq$ .008 SEC $\frac{L}{R}$, W_L = 100 M j

   POWER FACTOR 50% FOR AC.
2. ALL AC RATINGS ARE GIVEN FOR UNGROUNDED CASE ONLY. MAXIMUM GROUNDED CASE RATING IS 0.20 AMPERES AT 115 VRMS, 60 OR 400 CPS.

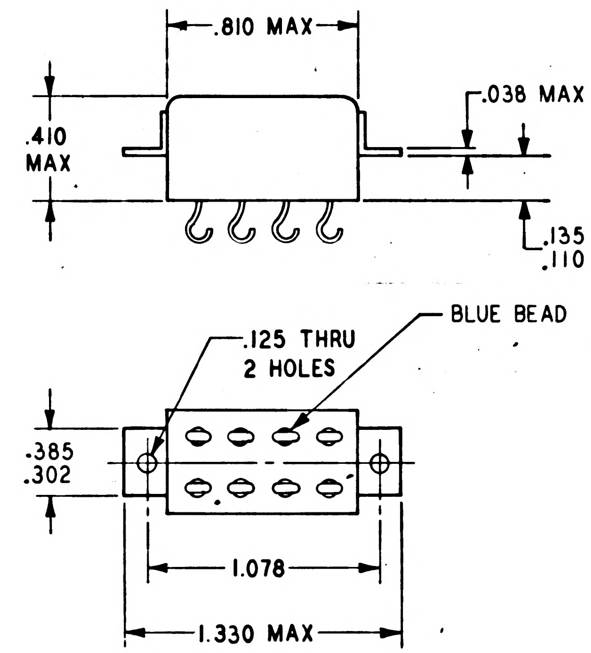
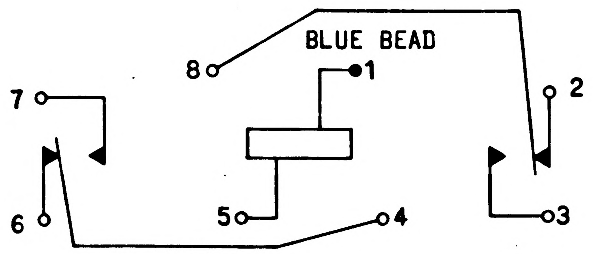


FIGURE 5



SCHEMATIC
SINGLE COIL
CONTACTS SHOWN DE-ENERGIZED
(NUMBERS FOR REF ONLY)

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO Contract NAS 9-497

DRAWN Bender DATE 29-MAR-65
CHECKED
APPROVAL
APPROVAL J. M 7-21-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(GENERAL-PURPOSE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 | SIZE C | NASA DRAWING NO. 1897222

SCALE — | WT | SHEET 3 OF 3

AC

1897222

REVISIONS TDRR 18772			
SYM	DESCRIPTION	DATE	APPROVAL

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. THIS UNIT SHALL MEET ALL APPLICABLE PARAGRAPHS OF MIL-R-5757 WITH THE FOLLOWING QUALIFICATIONS.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - (a) MANUFACTURER'S NAME OR SYMBOL.
       - (b) MANUFACTURER'S PART NUMBER.
       - (c) NASA DRAWING NUMBER, DASH NUMBER, AND REVISION LETTER.
       - (d) RATED COIL VOLTAGE.
       - (e) DATE CODE.
       - (f) COIL RESISTANCE.
       - (g) CIRCUIT DIAGRAM
   - B. ELECTRICAL REQUIREMENTS:
     - (1) PULL-IN VOLTAGE: SEE TABLE I.
     - (2) DROP-OUT VOLTAGE: SEE TABLE I.
     - (3) CONTACT RESISTANCE: (100% INSPECTION) .05 OHM MAXIMUM BEFORE AND DURING LIFE (.10 OHMS MAXIMUM AFTER LIFE) WHEN MEASURED WITH 100 MILLIAMPS FROM A SIX (6) VOLT DC SOURCE. (THE CONTACTS SHALL NOT SWITCH THE MEASURING LOAD).
     - (4) DIELECTRIC STRENGTH: SHALL WITHSTAND FOR ONE MINUTE THE FOLLOWING POTENTIALS AT THE INDICATED LEVELS, WITHOUT ARCING, DAMAGE, OR BREAKDOWN.
       - (a) SEA LEVEL: 1000 VOLTS RMS 60 CPS BETWEEN,
         CONTACT TERMINALS AND COIL TERMINALS,
         CONTACT TERMINALS AND CASE,
         CIRCUITS.
       - (b) SEA LEVEL: 500 VOLTS RMS 60 CPS BETWEEN,
         OPEN CONTACT TERMINALS OF EACH CIRCUIT (RELAY BOTH ENERGIZED AND DEENERGIZED)
         COIL TERMINALS AND CASE.
     - (5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM, USING A 500 VOLT DC TEST POTENTIAL APPLIED BETWEEN
       - (a) COIL TERMINALS, COMMONLY CONNECTED, AND CASE
       - (b) EACH NORMALLY OPEN CONTACT AND CASE
       - (c) EACH MOVABLE, OR "COMMON", CONTACT AND CASE (WITH COIL DEENERGIZED)
       - (d) ALL CONTACT TERMINALS, COMMONLY CONNECTED, AND THE COIL TERMINALS.
     - (6) OPERATE TIME: 5 MILLISECONDS MAXIMUM OVER THE AMBIENT TEMPERATURE RANGE.
     - (7) RELEASE TIME: 5 MILLISECONDS MAXIMUM OVER THE AMBIENT TEMPERATURE RANGE.
     - (8) CONTACT BOUNCE TIME: 2 MILLISECONDS MAXIMUM OVER THE AMBIENT TEMPERATURE RANGE. (CONTACT BOUNCE TIME IS NOT TO BE INCLUDED IN OPERATE AND RELEASE TIME).

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

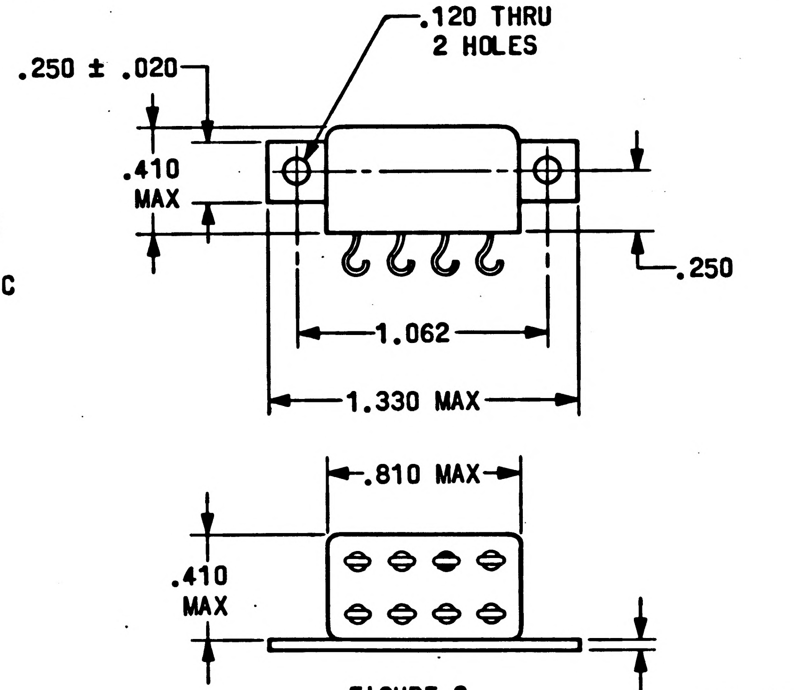


FIGURE 2

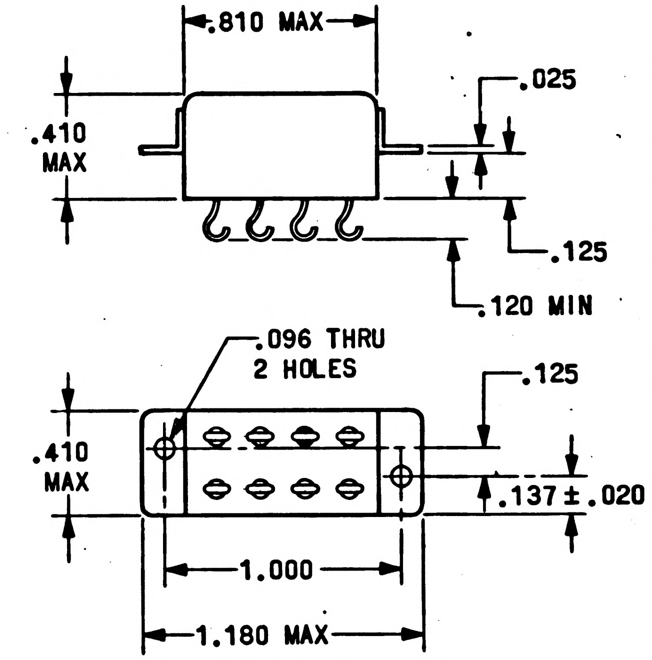


FIGURE 1

MASTER

SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.010 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL NONE
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT
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CAMBRIDGE, MASS.
DWG. NO. Contract NAS 9-497
DRAWN Bender DATE 29-MAR-65
CHECKED W. Diehl 29 Mar '65
APPROVAL Bergenthal 29 Mar '65
APPROVAL J. M. Watson 4-27-65
NASA APPROVAL 5/4/65
MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(GENERAL PURPOSE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897222
SCALE NONE	WT	SHEET 1 OF 3

AC

SYM	DESCRIPTION	DATE	APPROVAL

REVISIONS 18772

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REQUIREMENTS: (CONTINUED)

3. DESIGN:
   - A. AMBIENT TEMPERATURE RANGE: -65°C TO +125°C.
   - B. COIL RESISTANCE: SEE TABLE I.
   - C. LIFE: WHEN TESTED AT ANY OF THE ABOVE RATINGS, OR BETWEEN THE MAXIMUM RATING AND THE MINIMUM RATING, FOR 100,000 CYCLES, OVER THE AMBIENT TEMPERATURE RANGE, THERE SHALL BE NO CONTACT RESISTANCE READING GREATER THAN 1 OHM DURING ANY CYCLE.
   - D. TERMINAL STRENGTH: 3 LBS MINIMUM AXIAL PULL.
   - E. SEALING: SEAL TEST III EXCEPT THE MAXIMUM LEAK RATE SHALL BE 10^{-8} cc/SEC.
   - F. ENVIRONMENTAL LEVELS:
     - (1) TEMPERATURE:
       - (a) HIGH: +125°C.
       - (b) LOW: -65°C.
     - (2) THERMAL SHOCK: -65°C TO +125°C.
     - (3) VIBRATION: 10-2000 CPS, 20 G.
     - (4) SHOCK: 50 G, 11 MILLISECONDS.
     - (5) ACCELERATION: 20 G.
     - (6) ALTITUDE: 70,000 FEET.
     - (7) HUMIDITY: 10 CYCLES.
   - G. CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (2 PDT).
   - H. CONTACT RATINGS: PER TABLE II.
   - J. COIL DISSIPATION: 1.5 WATTS MAX AT +125°C.
   - K. COIL VOLTAGE: SEE TABLE I.

4. SPECIAL CONDITIONING:
   - A. MISS TEST:
     - (1) THE MANUFACTURER SHALL SUBJECT ALL RELAYS TO 5000 OPERATIONS UNDER THE FOLLOWING CONDITIONS:
       - (a) 30 MICROAMPERES MAXIMUM CURRENT.
       - (b) 50 MILLIVOLTS MAXIMUM VOLTAGE.
       - (c) 50 OHMS MAXIMUM CONTACT RESISTANCE PER CONTACT PAIR.
       - (d) RATED COIL VOLTAGE APPLIED.
       - (e) 5 CPS MAXIMUM SWITCHING SPEED.
     - (2) CONTACT RESISTANCE, PULL-IN AND DROP-OUT VOLTAGE SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CERTIFICATION OF THESE MEASUREMENTS SHALL BE FURNISHED TO THE USER. THE MANUFACTURER SHALL ALSO FURNISH THE USER A TABULATION SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5000 CYCLE TEST, THE NUMBER OF RELAYS FAILING DURING THE 5000 CYCLE TEST AND THE TIME OR CYCLE TO FAILURE. ONE COPY OF THIS INFORMATION SHALL BE FURNISHED WITH EACH SHIPMENT OF PARTS.

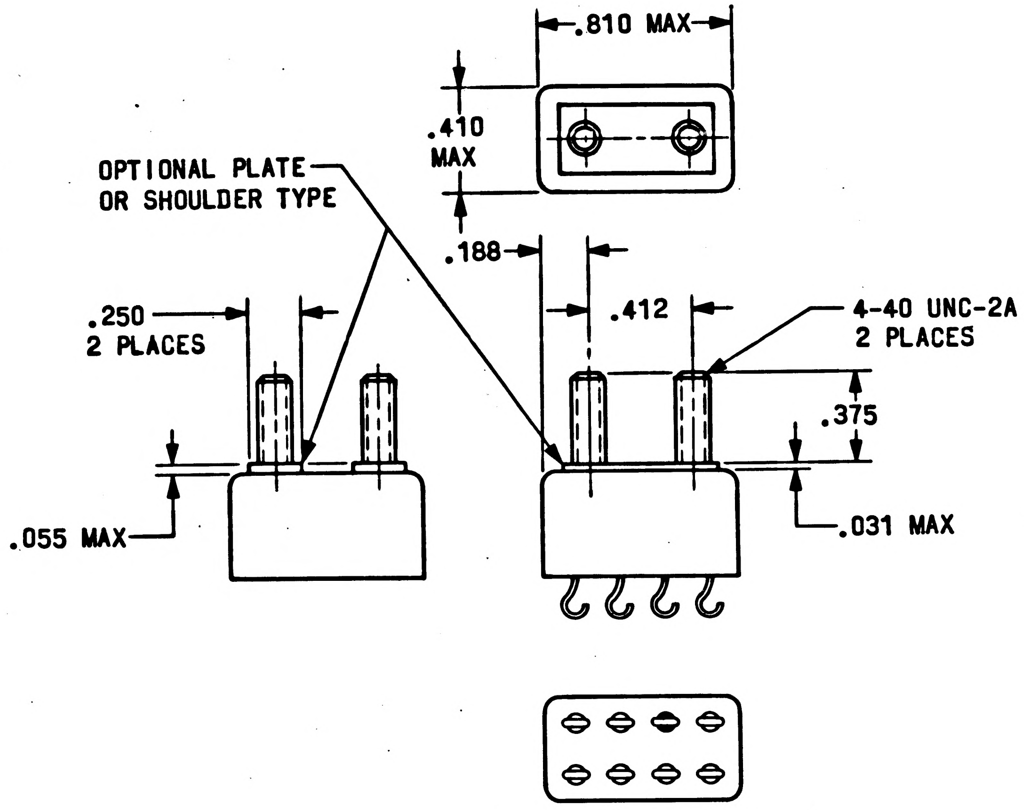

FIGURE 4

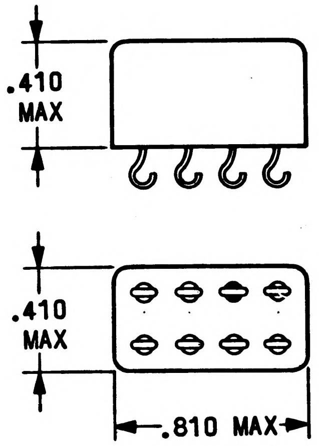

FIGURE 3

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
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DWG. NO. Contract NAS 9-497
DRAWN Bender DATE 29-MAR-65
CHECKED W. DIEHL 29 MAR '65
APPROVAL BERGENTHAL 29 MAR '65
APPROVAL J. M. Watson 4-27-66
NASA APPROVAL 5/4/65
MIT APPROVAL 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(GENERAL-PURPOSE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897222
SCALE —
WT
SHEET 2 OF 3

AC

4 3 2 1

1897222

REVISIONS TDRR 18772			
SYM	DESCRIPTION	DATE	APPROVAL

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TABLE I

NASA DASH NUMBER	FIGURE NO.	NOMINAL RATED COIL VOLTAGE (VOLTS DC)	PULL-IN VOLTAGE (VOLTS DC)			DROP-OUT VOLTAGE (VOLTS DC)		COIL RESISTANCE RANGE AT +25°C (OHMS)
			MAX (OVER AMBIENT TEMP RANGE)	MINIMUM (AT +25°C)	MIN (OVER AMBIENT TEMP RANGE)	MAX (OVER AMBIENT TEMP RANGE)	MIN (OVER AMBIENT TEMP RANGE)	
-1	1	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-2	2	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-3	3	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-4	4	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-5	1	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-6	2	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-7	3	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-8	4	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235
-9	5	28.0	18.0	9.0	5.0	14.0	1.0	745 TO 990
-10	5	12.0	9.3	4.1	2.3	7.2	0.41	170 TO 235

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

TABLE II

	28 VDC	115 VRMS, 60 CPS	115 VRMS, 400 CPS	115/200 VRMS, 60 CPS	115/200 VRMS, 400 CPS	SEE NOTE 2
RESISTIVE	2.0	1.0	1.0	0.5	0.75	
INDUCTIVE	0.5	0.5	0.75	0.5	0.75	SEE NOTE 1
LAMP	0.5	0.5	0.5	0.3	0.3	
MINIMUM	0.1	——	——	——	——	

NOTES:

1. INDUCTIVE LOAD LIMITED BY $\leq .008$ SEC $\frac{L}{R}$, $W_L = 100$ M j

   POWER FACTOR 50% FOR AC.

2. ALL AC RATINGS ARE GIVEN FOR UNGROUNDED CASE ONLY. MAXIMUM GROUNDED CASE RATING IS 0.20 AMPERES AT 115 VRMS, 60 OR 400 CPS.

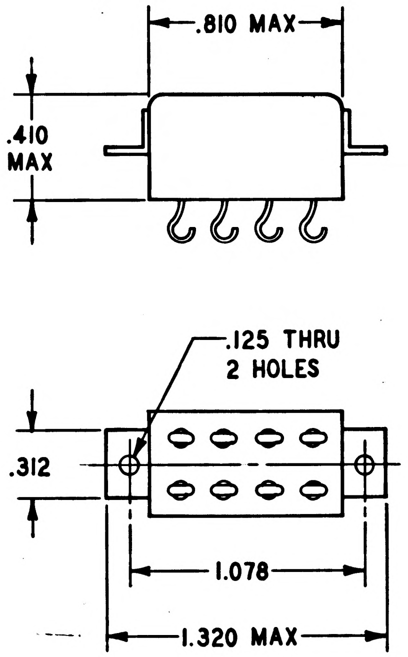
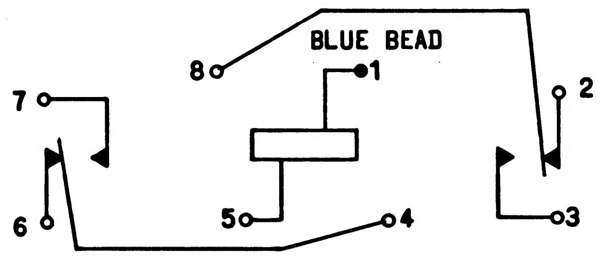


FIGURE 5



SCHEMATIC
SINGLE COIL
CONTACTS SHOWN DE-ENERGIZED
(NUMBERS FOR REF ONLY)

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
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APPROVAL J. M. Watson 4-27-65
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 5-4-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE
(GENERAL-PURPOSE)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897222
SCALE ——
WT
SHEET 3 OF 3

4 3 2 1 AC

1897224 B

REVISIONS	23 408		
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 202365	29 JUN 65	JW / WD
B	INITIAL RELEASE CLASS A PER TDRR 23408	10-18-65	NRC / FG

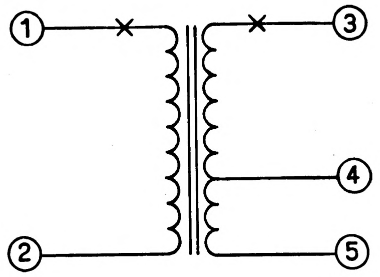
NOTICE — WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REQUIREMENTS:

1. GENERAL:
   - A. TRANSFORMER DESIGN INC. PART NUMBER TD-947 (FOR REF.)
   - B. RAYTHEON PART NUMBER 160926 (FOR REF.)
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - D. DESIGN TO BE IN CONFORMANCE WITH SPECIFICATION MIL-T-27.
   - E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

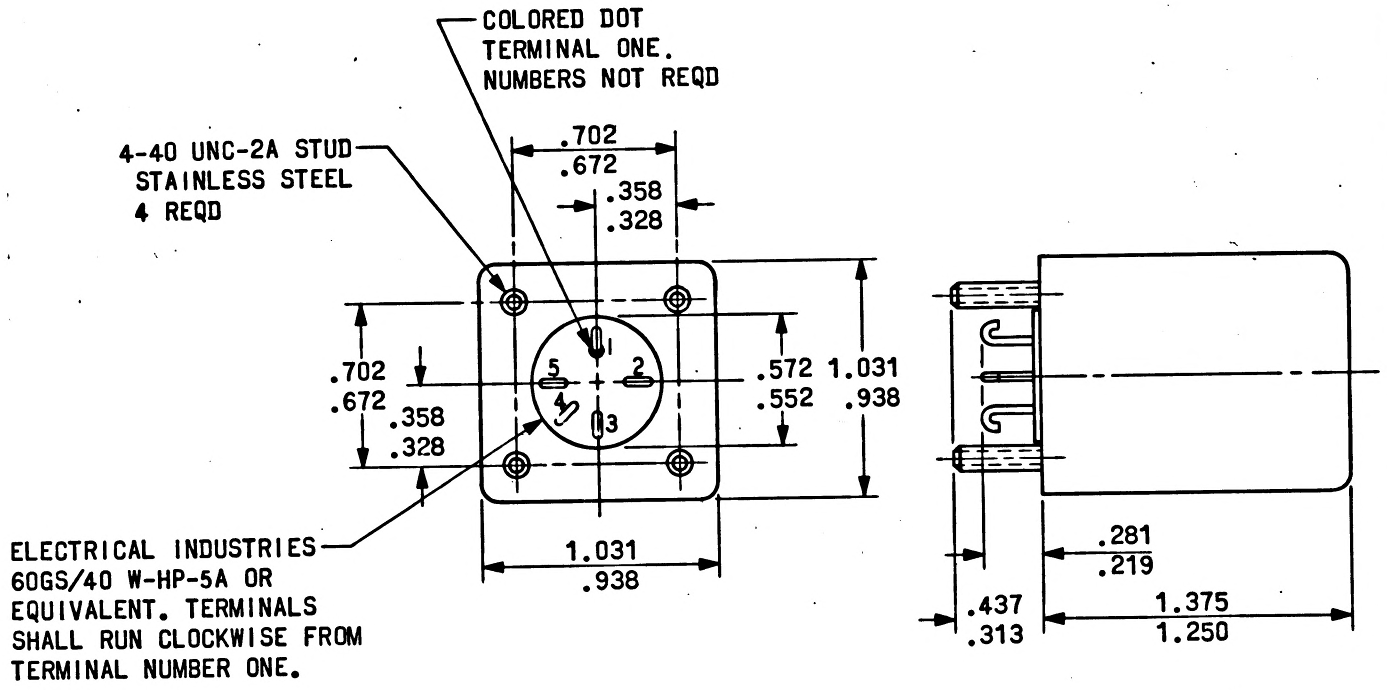
2. INSPECTION AND ACCEPTANCE:
   - A. UNIT SHALL MEET ALL REQUIREMENTS OF TABLE I.
   - B. COLOR: UNIT SHALL BE FINISHED WITH COLOR 514 OF ANA BULLETIN 157 (INSTRUMENT BLACK).
   - C. MARKING: MARK PERMANENTLY AND LEGIBLY WITH THE NASA DRAWING NUMBER PLUS ALL MARKING REQUIREMENTS OF MIL-T-27. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON PART AND PACKAGE.

3. DESIGN:
   - A. THE UNIT SHALL MEET ALL REQUIREMENTS OF MIL-T-27 FOR GRADE 4, CLASS R, LIFE EXPECTANCY X, IN AN AMBIENT TEMPERATURE OF 65°C EXCEPT PARAGRAPH 3.1 AND LIFE TEST UNDER GROUP C INSPECTION TESTS WHICH SHALL BE WAIVED.
   - B. ALTITUDE: 10,000 FEET OPERATING, 50,000 FEET NON-OPERATING
   - C. AMBIENT OPERATING TEMPERATURE RANGE: 0°C TO +65°C
   - D. SOLDER USED FOR ELECTRICAL CONNECTIONS SHALL BE COMPOSITION SN60 PER QQ-S-571C.
   - E. MAXIMUM WORKING VOLTAGE: 175 VOLTS INSTANTANEOUS.
   - F. UNIT SHALL BE WOUND USING MAGNET WIRE INSULATED WITH HEAVY VINYL ACETAL RESIN OR EQUIV.
   - G. PRIMARY DC CURRENT: 0
   - H. UNIT SHALL BE CAPABLE OF WITHSTANDING WITHOUT DAMAGE AN INPUT VOLTAGE VARIATION OF ± 5% AND A FREQUENCY VARIATION OF ± 32 CPS.



SCHEMATIC DIAGRAM

VOLTAGES AND CURRENTS ARE RMS VALUES UNLESS OTHERWISE NOTED.


COLORED DOT TERMINAL ONE. NUMBERS NOT REQD
4-40 UNC-2A STUD STAINLESS STEEL 4 REQD
ELECTRICAL INDUSTRIES 60GS/40 W-HP-5A OR EQUIVALENT. TERMINALS SHALL RUN CLOCKWISE FROM TERMINAL NUMBER ONE.
.702
.672
.358
.328
1
2
3
4
5
.702
.672
.358
.328
.572
.552
1.031
.938
1.031
.938
.281
.219
.437
.313
1.375
1.250

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO Contract NAS 9-497
DRAWN Bender DATE 7-APR-65
CHECKED Ed Foster 9APR 65
APPROVAL E. Feltin 9 APR. '65
APPROVAL J. M. Watson 10-12-65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, POWER, ISOLATION
(2-28/2-2 VOLTS, 3200 CPS .01 MW)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897224
SCALE NONE
WT
SHEET 1 OF 2

1897224

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

1897224 B

REVISIONS 23408

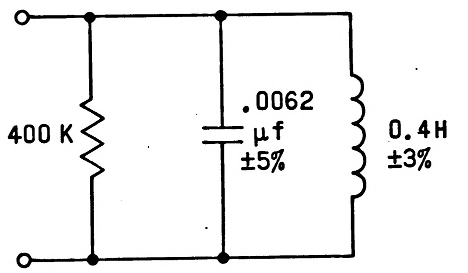
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 202365	29 JUN 65	JW WD
B	INITIAL RELEASE CLASS A PER TDRR 23408	10-18-65	MRC

TABLE I

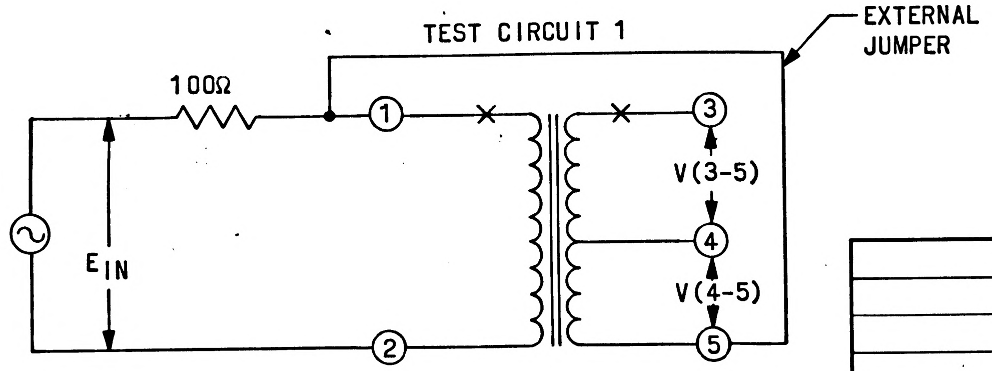
INSPECTION TESTS

TITLES IN PARAGRAPH COLUMN REFER TO TITLES IN SPECIFICATION MIL-T-27

PARAGRAPH	
SEALING	IMMERSE IN LIQUID AS INDICATED
DIELECTRIC STRENGTH	APPLY 500 VOLTS BETWEEN WINDINGS AND BETWEEN WINDINGS AND CASE
INDUCED VOLTAGE	APPLY 56 VOLTS, 6400 CPS TO TERMINALS (1-2), SECONDARY OPEN
INSULATION RESISTANCE	10,000 MEGOHMS MINIMUM AT 25°C
RATED LOAD	a. WITH AN INPUT (1-2) OF 2 VOLTS, 3200 CPS, THE FULL LOAD VOLTAGE RATIO SHALL BE: $\frac{V(1-2)}{V(3-5)} = 1:1 \pm 1\%$ WITH THE LOAD SPECIFIED IN FIGURE I CONNECTED TO TERMINALS (3-5). b. WITH AN INPUT (1-2) OF 28 VOLTS, 3200 CPS, THE FULL LOAD VOLTAGE RATIO SHALL BE: $\frac{V(1-2)}{V(4-5)} = 14:1 \pm 1\%$ WITH THE LOAD SPECIFIED IN FIGURE I CONNECTED TO TERMINALS (4-5) AND NO LOAD (3-4).
PRIMARY OPEN CIRCUIT IMPEDANCE	SHALL BE 150,000 OHMS MINIMUM (1-2) WITH 2 VOLTS TO 28 VOLTS, 3200 CPS, 0 DC (1-2) SECONDARY OPEN.
POLARITY	TERMINALS 1 AND 3 SHALL BE OF LIKE POLARITY.
PHASE SHIFT	a. THE PHASE SHIFT OF VOLTAGE (3-5) WITH RESPECT TO VOLTAGE E_{IN} SHALL BE 180° ± 0.3°. MEASURE WITH 2 VOLTS, 3200 CPS APPLIED (1-2), LOAD PER FIGURE I CONNECTED ACROSS TERMINALS (3-5). CONNECT EXTERNAL JUMPER TO TERMINALS 1 AND 5. USE TEST CIRCUIT I. b. THE PHASE SHIFT OF VOLTAGE (4-5) WITH RESPECT TO VOLTAGE E_{IN} SHALL BE 180° ± 0.3°. MEASURE WITH 28 VOLTS, 3200 CPS APPLIED (1-2), LOAD PER FIGURE I CONNECTED ACROSS TERMINALS (4-5), NO LOAD (3-4). CONNECT EXTERNAL JUMPER TO TERMINALS 1 AND 5. USE TEST CIRCUIT I.



TEST LOAD FIGURE 1



PHASE SHIFT TEST CIRCUIT

1897224

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
Contract NAS 9-497
DWG NO

DRAWN Bender DATE 7-APR-65
CHECKED Ed Foster 9 APR 65
APPROVAL E. Fuller 9 APR '65
APPROVAL J. M. Watson 10-12-65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, POWER, ISOLATION
(2-28/2-2 VOLTS, 3200 CPS .01 MW)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897224
SCALE
WT
SHEET 2 OF 2

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897231 B

REVISIONS TDRR 21022

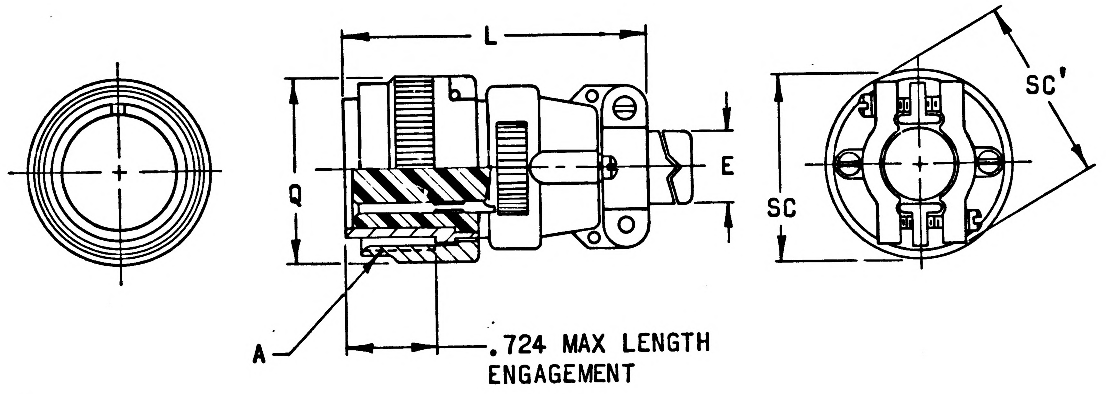
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 201199	19-MAY 65	M.G. WD
B	REVISION STATUS CHANGED	21 JUN 65	SRA EF

REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE ENVIRONMENTAL AND ELECTRICAL REQUIREMENTS OF MIL-C-5015 CLASS R EXCEPT AS AMENDED OR REVISED PER THIS DOCUMENT.

2. INSPECTION AND ACCEPTANCE:
   A. MECHANICAL REQUIREMENTS:
      (1) INSULATION RESISTANCE: 5000 MEGOHMS AT 25° ± 3°C AT 500 VDC.
      (2) CONTACT WITHDRAWAL FORCE: SEE TABLE II
      (3) MARKING:
         (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER AND DATE CODE OR DATE OF MANUFACTURE.
         (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
            SUPPLIER'S NAME
            NASA PART NUMBER
            DATE CODE, OR DATE OF MANUFACTURE
         (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   A. ELECTRICAL REQUIREMENTS:
      (1) CONTACTS: SEE TABLES III AND IV.
   B. OPERATING TEMPERATURE: +85°C MAX.
   C. MATERIAL AND FINISH:
      (1) SHELL: ALUMINUM ALLOY CADMIUM PLATED WITH CHROMATE COATING.
      (2) INSULATOR: POLYCHLOROPRENE-DUROMETER HARDNESS 65 TO 85.
      (3) CONTACTS: BRASS OR COPPER, SILVER PLATED
      (4) SOLDER CUPS: TINNED



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

~~UNLESS OTHERWISE SPECIFIED~~
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ±.02 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DWG NO Contract NAS 9-497
DRAWN J. Wolski DATE 9 APR 65
CHECKED Ed Foster 12 APR 65
APPROVAL P. Tanner 12 Apr 65
APPROVAL J. M. Watson 4-27-65
NASA APPROVAL
MIT APPROVAL 21/6/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL-
SOCKET CONTACTS WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897231
SCALE NONE
WT
SHEET 1 OF 3

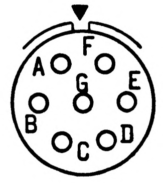
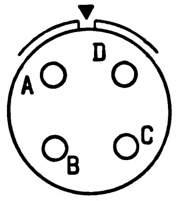
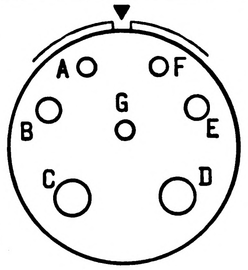
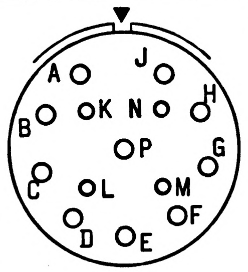
SCHLAEFER 2 of 7 E.F.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 21022

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 201199	19 MAY 65	M.G. WD
B	REVISION STATUS CHANGED	21 JUN 65	SA EF

TABLE I

NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CONTACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE	CABLE ENTRY MAX DIA	MAX OVER-ALL LENGTH	MAX NUT OUTER DIA	MAX CLAMP WIDTH	MAX DIAGONAL ACROSS CLAMP	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT FACE VIEW
					A	E	L	Q	SC	SC'		
-101	0	7	12	20	1-1/4-18 NEF-2B	.750	2.656	1.47	1.468	1.875	CA3106E-20-15S (F137)	
-102	80										CA3106E-20-15SW(F137)	
-105	280										CA3106E-20-15SZ(F137)	
-126	0	4	8	22	1-3/8-28 NEF-2B	.750	2.656	1.59	1.468	1.875	CA3106E-22-22S (F137)	
-128	110										CA3106E-22-22SX(F137)	
-129	250										CA3106E-22-22SY(F137)	
-151	0	7	3 12(AFG) 2 8(BE) 2 4(CD)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125	CA3106E-28-10S (F137)	
-152	80										CA3106E-28-10SW(F137)	
-153	110										CA3106E-28-10SX(F137)	
-154	250										CA3106E-28-10SY(F137)	
-155	280										CA3106E-28-10SZ(F137)	
-201	0	14	4 16(KLMN) 10 12(A-J&P)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125	CA3106E-28-20S (F137)	
-202	80										CA3106E-28-20SW(F137)	
-203	110										CA3106E-28-20SX(F137)	
-204	250										CA3106E-28-20SY(F137)	
-205	280										CA3106E-28-20SZ(F137)	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO Contract NAS 9-497

DRAWN J Wolski DATE 9 APR 65
CHECKED Ed Foster 12 APR 65
APPROVAL R. Trummer 12 Apr 65
APPROVAL J. M. Watson 4-27-65

NASA APPROVAL

MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL-
SOCKET CONTACTS WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897231
SCALE
WT
SHEET 2 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 21022

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC-201199	19-MAY 65	MG WD
B	REVISED PER MXC -202414	21 JUN 65	SRA EF

TABLE I (CONTINUED)

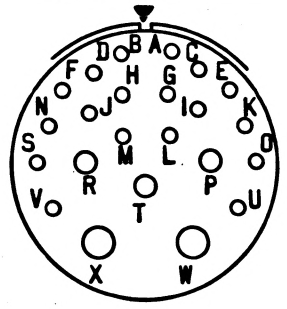
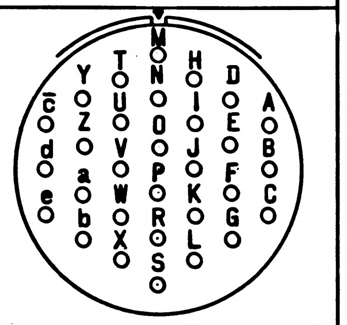
NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CON-TACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE	CABLE ENTRY MAX DIA	MAX OVER-ALL LENGTH	MAX NUT OUTER DIA	MAX CLAMP WIDTH	MAX DIAGONAL ACROSS CLAMP	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT FACE VIEW
					A	E	L	Q	SC	SC'		
-226	0	23	16 16(A-O&S)	32	2-18 NS-2B	1.250	2.953	2.22	2.030	2.531	CA3106E-32-6S (F137)	
-227	80		2 12(U&V)								CA3106E-32-6SW(F137)	
-228	110		3 8(PRT)								CA3106E-32-6SX(F137)	
-229	250		2 4(W&X)								CA3106E-32-6SY(F137)	
-230	280										CA3106E-32-6SZ(F137)	
-251	0	30	24 16(A-L,	32	2-18 NS-2B	1.250	2.953	2.22	2.030	2.531	CA3106E-32-8P (F137)	
-252	80		T-Z,								CA3106E-32-8PW(F137)	
-253	125		&a-e)								CA3106E-32-8PX(F137)	
-254	235		6 12(M-S)								CA3106E-32-8PY(F137)	
-255	280										CA3106E-32-8PZ(F137)	

TABLE II

CONTACT SIZE	GAUGE PIN DIA +.0001 -.0000	FORCE IN LBS		
		AVG	MAX	MIN
16	.0625	2.1	3	.25
12	.094	3.5	5	.50
8	.142	7	10	.75
4	.225	10.5	15	1

TABLE III

CONTACT SIZE	MAX CURRENT RATING (AMP)	CONTACT RESISTANCE (MILLIVOLTS)
16	22	21
12	41	20
8	73	12
4	135	10

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER

TABLE IV

CONTACT ARRANGEMENTS	VOLTAGE RATING (DC)	TEST VOLTAGE (RMS)
20-15	700	2000
22-22	700	2000
28-10	1250 (G HOLE)	2800
	700 (ALL OTHER)	2000
28-20	700	2000
32-6	700	2000

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TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. Contract NAS 9-497

DRAWN J. Wolski DATE 9 APR 65
CHECKED Ed Foster 12 Apr 65
APPROVAL R. Trummer 12 Apr 65
APPROVAL J. M. Watson 7-12-65

NASA APPROVAL A. C. 7/21/65
MIT APPROVAL 21 July 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL— SOCKET CONTACTS WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897231

SCALE NONE WT SHEET 3 OF 3

REVISIONS TDRR 21022			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 201199	19-MAY 65	M.G. WD
B	REVISION STATUS CHANGED	21 JUN 65	SRA EF
C	REVISED PER TDRR-22384	24-SEP-65	B. EF

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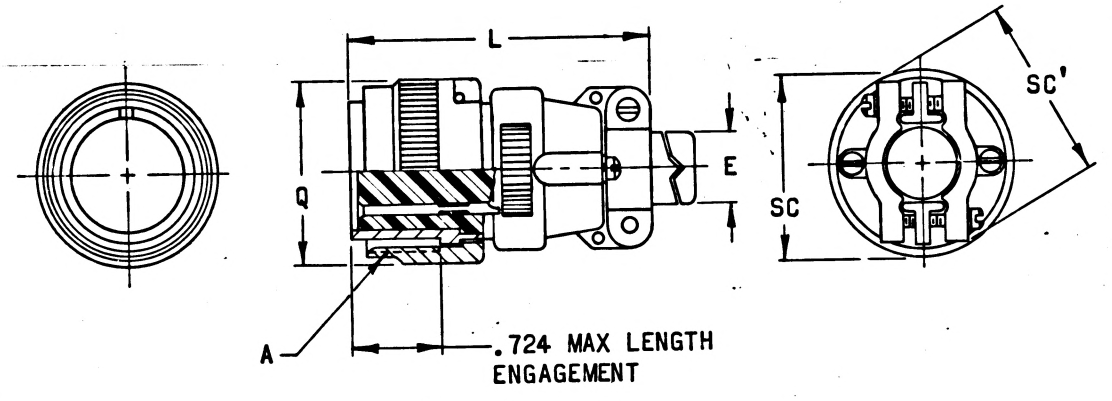
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE ENVIRONMENTAL AND ELECTRICAL REQUIREMENTS OF MIL-C-5015 CLASS R EXCEPT AS AMENDED OR REVISED PER THIS DOCUMENT.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) INSULATION RESISTANCE: 5000 MEGOHMS AT 25° ± 3°C AT 500 VDC.
     - (2) CONTACT WITHDRAWAL FORCE: SEE TABLE II
     - (3) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACTS: SEE TABLES III AND IV.
   - B. OPERATING TEMPERATURE: +85°C MAX.
   - C. MATERIAL AND FINISH:
     - (1) SHELL: ALUMINUM ALLOY CADMIUM PLATED WITH CHROMATE COATING.
     - (2) INSULATOR: POLYCHLOROPRENE-DUROMETER HARDNESS 65 TO 85.
     - (3) CONTACTS: BRASS OR COPPER, SILVER PLATED
     - (4) SOLDER CUPS: TINNED



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TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ±.02 ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH SEE REQUIREMENTS

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN Contract NAS 9-497
DRAWN J. Wolski DATE 9 APR 65
CHECKED Ed Foster 12 APR 65
APPROVAL P. Tammes 12 Apr 65
APPROVAL J. M. Watson 4-27-65
NASA APPROVAL
MIT APPROVAL 21 Sep 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL-
SOCKET CONTACTS WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897231
SCALE NONE	WT	SHEET 1 OF 3

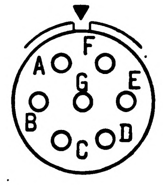
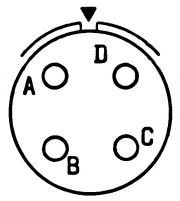
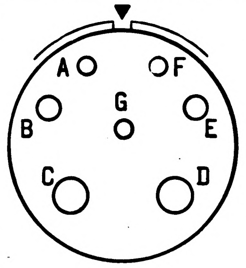
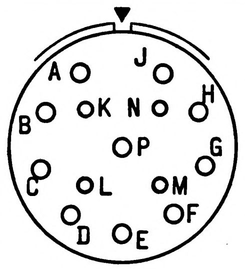
SCHLAEFER 2 of 7 E.F.

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

1897231 C

REVISIONS TDRR 21022			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC 201199	19 MAY 65	M.G. WD
B	REVISION STATUS CHANGED	21 JUN 65	SA EF
C	REVISED PER TDRR-22384	24 SEP 65	B. EF

TABLE I

NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CONTACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE A	CABLE ENTRY MAX DIA E	MAX OVER-ALL LENGTH L	MAX NUT OUTER DIA Q	MAX CLAMP WIDTH SC	MAX DIAGONAL ACROSS CLAMP SC'		INSERT ARRANGEMENT FACE VIEW
-101 -102 -105	0 80 280	7	12	20	1-1/4-18 NEF-2B	.750	2.656	1.47	1.468	1.875		
-126 -128 -129	0 110 250	4	8	22	1-3/8-28 NEF-2B	.750	2.656	1.59	1.468	1.875		
-151 -152 -153 -154 -155	0 80 110 250 280	7	3 12(AFG) 2 8(BE) 2 4(CD)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125		
-201 -202 -203 -204 -205	0 80 110 250 280	14	4 16(KLMN) 10 12(A-J&P)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
Contract NAS 9-497
DRAWN J Wolske DATE 9 APR 65
CHECKED Ed Foster 12 APR 65
APPROVAL R. Trummer 12 Apr 65
APPROVAL J. M Watson 4-27-65
NASA APPROVAL
MIT APPROVAL 21 July 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL-
SOCKET CONTACTS WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897231
SCALE
WT
SHEET 2 OF 3

1897231

C 1897231

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 21022

SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER MXC-201199	19-MAY 65	MG WD.
B	REVISED PER MXC-202414	21 JUN 65	SRA EF
C	REVISED PER TDRR-22384	24-SEP-65	B. EF

TABLE I (CONTINUED)

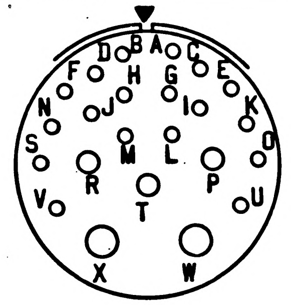
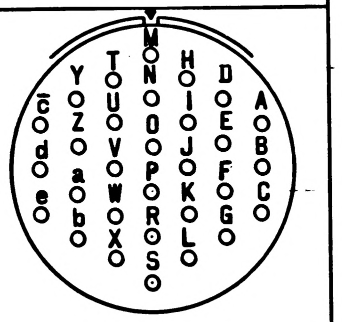
NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CONTACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE A	CABLE ENTRY MAX DIA E	MAX OVER-ALL LENGTH L	MAX NUT OUTER DIA Q	MAX CLAMP WIDTH SC	MAX DIAGONAL ACROSS CLAMP SC'		INSERT ARRANGEMENT FACE VIEW
-226	0	23	16 16(A-O&S)	32	2-18 NS-2B	1.250	2.953	2.22	2.030	2.531		 A B C D E F G H I J K L M N O P R S T U V W X
-227	80		2 12(U&V)									
-228	110		3 8(PRT)									
-229	250		2 4(W&X)									
-230	280											
-251	0	30	24 16(A-L, T-Z, &a-e)	32	2-18 NS-2B	1.250	2.953	2.22	2.030	2.531		 M A B C D E F G H I J K L N O P R S T U V W X Y Z a b c d e
-252	80		6 12(M-S)									
-253	125											
-254	235											
-255	280											

TABLE II

CONTACT SIZE	GAUGE PIN DIA +.0001 -.0000	FORCE IN LBS AVG	MAX	MIN
16	.0625	2.1	3	.25
12	.094	3.5	5	.50
8	.142	7	10	.75
4	.225	10.5	15	1

TABLE III

CONTACT SIZE	MAX CURRENT RATING (AMP)	CONTACT RESISTANCE (MILLIVOLTS)
16	22	21
12	41	20
8	73	12
4	135	10

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER

TABLE IV

CONTACT ARRANGEMENTS	VOLTAGE RATING (DC)	TEST VOLTAGE (RMS)
20-15	700	2000
22-22	700	2000
28-10	1250 (G HOLE)	2800
	700 (ALL OTHER)	2000
28-20	700	2000
32-6	700	2000

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN Contract NAS 9-497
DRAWN J. Wolski DATE 9 APR 65
CHECKED Ed Foster 12 Apr 65
APPROVAL R. Trummer 12 Apr 65
APPROVAL J. M. Watson 7-12-65
NASA APPROVAL A. C. [illegible] 7/21/65
MIT APPROVAL [illegible] 21 Jul 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
SOCKET CONTACTS WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C NASA DRAWING NO. 1897231
SCALE NONE WT SHEET 3 OF 3

1897231

1897232 B

SYM	DESCRIPTION	DATE	APPROVAL
A	① REVISED PER MXC 201200	20 MAY 65	R.W.T. / EF
B	REVISION STATUS CHANGED	22 JUN 65	SRA / EF

REVISIONS TDRR 21022

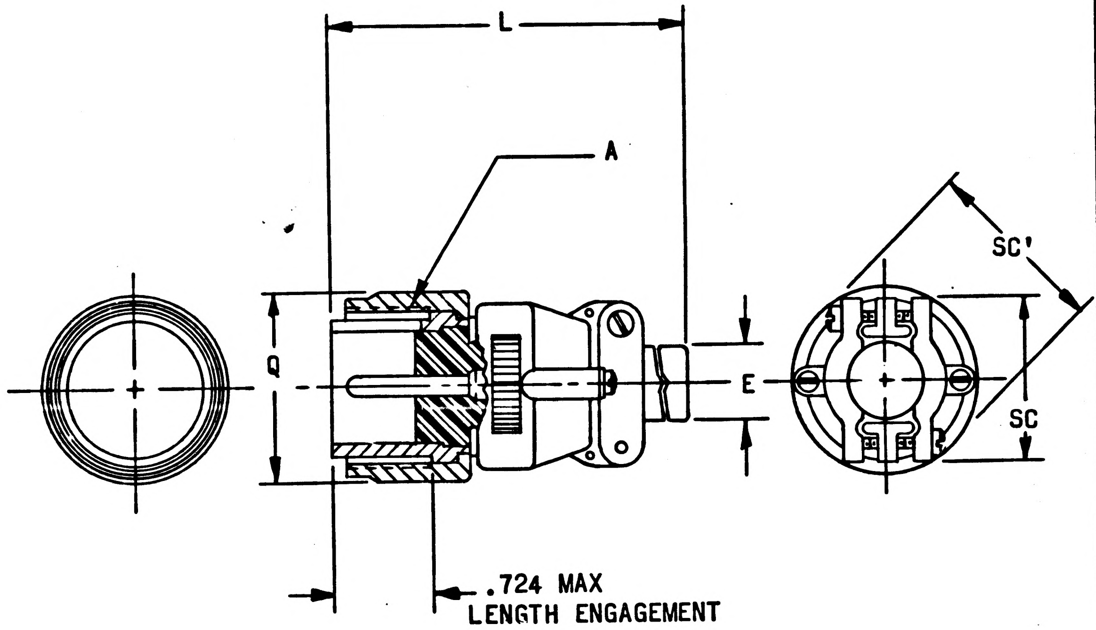
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE ENVIRONMENTAL AND ELECTRICAL REQUIREMENTS OF MIL-C-5015 CLASS R EXCEPT AS AMENDED OR REVISED PER THIS DOCUMENT.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) INSULATION RESISTANCE: 5000 MEGOHMS AT 25° ± 3°C AT 500 VDC.
     - (2) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER AND DATE CODE OR DATE OF MANUFACTURE.
       - (b) PACKAGING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACTS: SEE TABLE II AND III.
   - B. OPERATING TEMPERATURE: +85°C MAX.
   - C. MATERIALS:
     - (1) SHELL: ALUMINUM ALLOY, CADMIUM PLATED WITH CHROMATE COATING.
     - (2) INSULATOR: POLYCHLOROPRENE-DUROMETER HARDNESS 65 TO 85.
     - (3) CONTACTS: BRASS OR COPPER, SILVER PLATED.
     - (4) SOLDER CUPS TINNED.



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
HEAT TREATMENT NONE
FINAL FINISH NONE

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
Contract NAS 9-497

DRAWN SPLANE DATE 9 APR 65
CHECKED W. Diehl 14 APR '65
APPROVAL J.V. WEAN 14 APR '65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
PIN CONTACT WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897232
SCALE NONE
WT
SHEET 1 OF 3

1897232

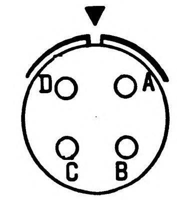
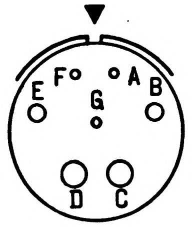
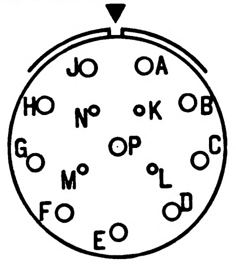
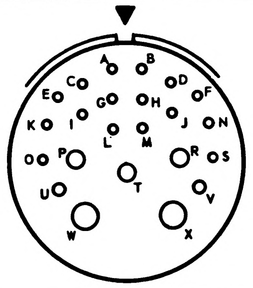
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

1897232 B

REVISIONS TDRR 21022

SYM	DESCRIPTION	DATE	APPROVAL
A	① REVISED PER MYC 201200	20 MAY 65	R.N.T. / EF
B	REVISION STATUS CHANGED	21 JUN 65	SRA / EF

TABLE I

NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CONTACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE A	CABLE ENTRY MAX DIA E	MAX OVER-ALL LENGTH L	MAX NUT OUTER DIA Q	MAX CLAMP WIDTH SC	MAX DIAGONAL ACROSS CLAMP SC'	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT (FACE VIEW)
-101	0	4	#8	22	1-3/8-18 NEF-28	.750	2.656	1.59	1.468	1.875	CA3106E-22-22P(F137)	
-103	110										CA3106E-22-22PX(F137)	
-104	250										CA3106E-22-22PY(F137)	
-126	0	7	3#12(AFG)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125	CA3106E-28-10P(F137)	
-127	80		2#8(BE)								CA3106E-28-10PW(F137)	
-128	110		2#4(CD)								CA3106E-28-10PX(F137)	
-129	250										CA3106E-28-10PY(F137)	
-130	280										CA3106E-28-10PZ(F137)	
-151	0	14	4#16(KLMN)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125	CA3106E-28-20P(F137)	 J A H N K B G P C M L F D E
-152	80		10#12(A-J&P)								CA3106E-28-20PW(F137)	
-153	110										CA3106E-28-20PX(F137)	
-154	250										CA3106E-28-20PY(F137)	
-155	280										CA3106E-28-20PZ(F137)	
-201	0	23	16#16(A-O&S)	32	2-18NS -2B	1.250	2.953	2.22	2.030	2.531	CA3106E-32-6P(F137)	 A B C D E F G H K I J N L M O P R S T U V W X
-202	80		2#12(U&V)								CA3106E-32-6PW(F137)	
-203	110		3#8(PRT)								CA3106E-32-6PX(F137)	
-204	250		2#4(W&X)								CA3106E-32-6PY(F137)	
-205	280										CA3106E-32-6PZ(F137)	

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
DWG. NO. Contract NAS 9-497
DRAWN SPLANE DATE 9 APR 65
CHECKED W. Diehl 14 APR '65
APPROVAL J. V. WEAN 14 APR '65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
PIN CONTACT WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897232
SCALE
WT
SHEET 2 OF 3

REVISIONS IDRR 21022					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		① SHT 3 REDRAWN PER MXC 201200 ② ADDED -251 THRU -255		20 MAY 65	R.W.T. / EF
B		REVISED PER MXC-202415		21 JUN 65	SRA / EF

TABLE III

CONTACT ARRANGEMENTS	VOLTAGE RATING (DC)	TEST VOLTAGE (RMS)
22-22	700	2000
28-10	1250 (G PIN)	2800
	700 (ALL OTHER)	2000
28-20	700	2000
32-6	700	2000
36-9	700	2000

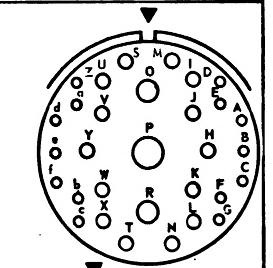
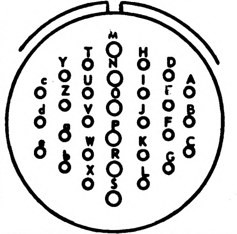
TABLE II

CONTACT SIZE	MAX CURRENT RATING (AMP)	CONTACT RESISTANCE (MILLIVOLTS)
16	22	21
12	41	20
8	73	12
4	135	10

TABLE IV

CONTACT SIZE	DIMENSIONS
16	.0635-.0615
12	.095-.093
8	.143-.141
4	.226-.224

TABLE I (CONTINUED)

NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CON-TACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE	CABLE ENTRY MAX DIA	MAX OVER-ALL LENGTH	MAX NUT OUTER DIA	MAX CLAMP WIDTH	MAX DIAGONAL ACROSS CLAMP	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT (FACE VIEW)
					A	E	L	Q	SC	SC		
-226	0	31	14#16(A-G&Z-f)	36	2-1/4-16 UN-2B	1.375	2.953	2.47	2.270	2.875	CA3106E-36-9P (F137)	
-227	80		14#12(H-N&S-Y)								CA3106E-36-9PW(F137)	
-228	125		2#8(O&R)								CA3106E-36-9PX(F137)	
-229	235		1#4(P)								CA3106E-36-9PY(F137)	
-230	280										CA3106E-36-9PZ(F137)	
-251	0	30	24#16(A-L,T-Z & a-e)	32	2-18 NS-2B	1.250	2.953	2.22	2.030	2.531	CA3106E-32-8S (F137)	
-252	80										CA3106E-32-8SW(F137)	
-253	125										CA3106E-32-8SX(F137)	
-254	235		6#12(M-S)								CA3106E-32-8SY(F137)	
-255	280										CA3106E-32-8SZ(F137)	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL
Contract NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN SPLANE DATE 9APR65
CHECKED DIEHL 14 APR 65
APPROVAL WEAN 14 APR 65
APPROVAL J. M. Watson 7-12-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
PIN CONTACT WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897232
SCALE ——
SHEET 3 OF 3

MIL 1077C—P

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 21022

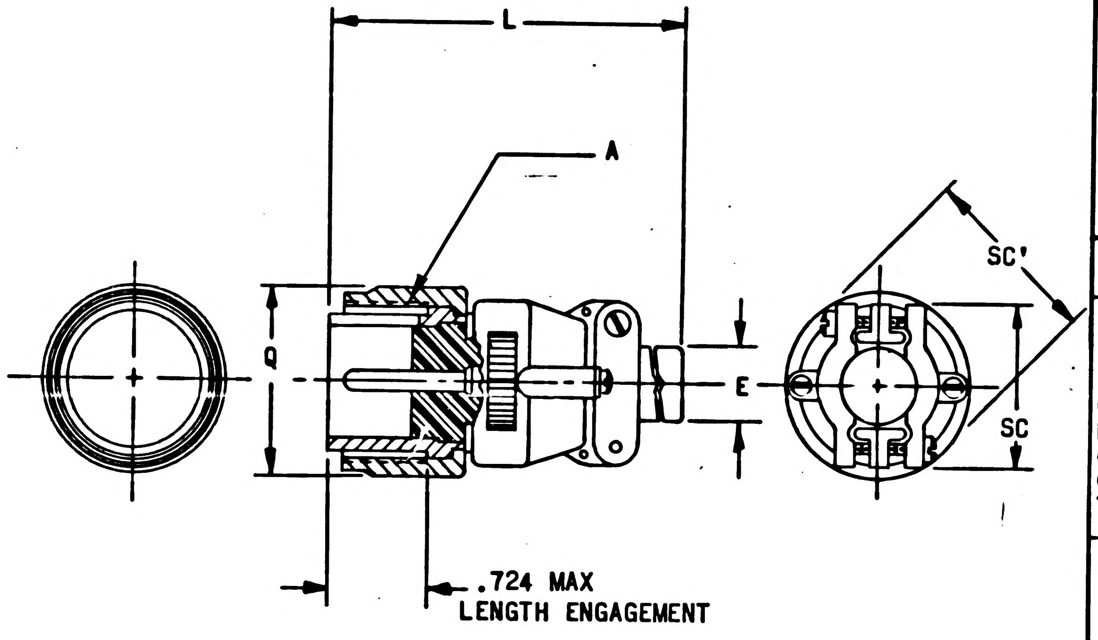
SYM	DESCRIPTION	DATE	APPROVAL
A	① REVISED PER MNC 201200	20 MAY. 65.	R.N.T. EF
B	REVISION STATUS CHANGED	22 JUN 65	SRA EF
C	REVISED PER TDRR 22914	11 OCT 65	JJJ EF

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE ENVIRONMENTAL AND ELECTRICAL REQUIREMENTS OF MIL-C-5015 CLASS R EXCEPT AS AMENDED OR REVISED PER THIS DOCUMENT.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) INSULATION RESISTANCE: 5000 MEGOHMS AT 25° ± 3°C AT 500 VDC.
     - (2) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER.
       - (b) PACKAGING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACTS: SEE TABLE II AND III.
   - B. OPERATING TEMPERATURE: +85°C MAX.
   - C. MATERIALS:
     - (1) SHELL: ALUMINUM ALLOY, CADMIUM PLATED WITH CHROMATE COATING.
     - (2) INSULATOR: POLYCHLOROPRENE-DUROMETER HARDNESS 65 TO 85.
     - (3) CONTACTS: BRASS OR COPPER, SILVER PLATED.
     - (4) SOLDER CUPS TINNED.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
NONE

FINAL FINISH
NONE

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
Contract NAS 9-497

DRAWN SPLANE DATE 9 APR 65
CHECKED W. Diehl 14 APR '65
APPROVAL J.V. WEAN 14 APR '65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
PIN CONTACT WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897232

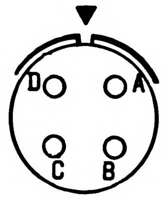
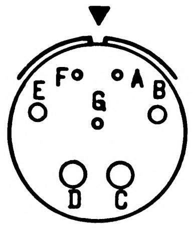
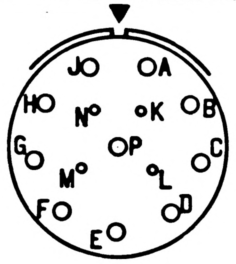
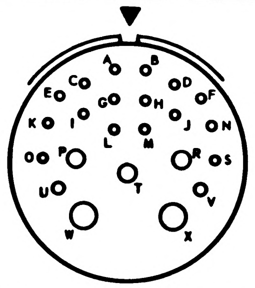
SCALE NONE WT SHEET 1 OF 4

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS TDRR 21022

SYM	DESCRIPTION	DATE	APPROVAL
A	① REVISED PER MXC 201200	20 MAY 65	R.N.T. / EF
B	REVISION STATUS CHANGED	21 JUN 65	SRA / EF
C	REVISED PER TDRR 22914	11 OCT 65	JJJ / EF

TABLE I

NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CON-TACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE A	CABLE ENTRY MAX DIA E	MAX OVER-ALL LENGTH L	MAX NUT OUTER DIA Q	MAX CLAMP WIDTH SC	MAX DIAGONAL ACROSS CLAMP SC'	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT (FACE VIEW)
-101	0	4	#8	22	1-3/8-18 NEF-28	.750	2.656	1.59	1.468	1.875	CA3106E-22-22P(F137)	
-103	110										CA3106E-22-22PX(F137)	
-104	250										CA3106E-22-22PY(F137)	
-126	0	7	3#12(AFG) 2#8(BE) 2#4(CD)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125	CA3106E-28-10P(F137)	
-127	80										CA3106E-28-10PW(F137)	
-128	110										CA3106E-28-10PX(F137)	
-129	250										CA3106E-28-10PY(F137)	
-130	280										CA3106E-28-10PZ(F137)	
-151	0	14	4#16(KLMN) 10#12(A-J&P)	28	1-3/4-18 NS-2B	.938	2.953	1.97	1.702	2.125	CA3106E-28-20P(F137)	
-152	80										CA3106E-28-20PW(F137)	
-153	110										CA3106E-28-20PX(F137)	
-154	250										CA3106E-28-20PY(F137)	
-155	280										CA3106E-28-20PZ(F137)	
-201	0	23	16#16(A-O&S) 2#12(U&V) 3#8(PRT) 2#4(W&X)	32	2-18NS -2B	1.250	2.953	2.22	2.030	2.531	CA3106E-32-6P(F137)	
-202	80										CA3106E-32-6PW(F137)	
-203	110										CA3106E-32-6PX(F137)	
-204	250										CA3106E-32-6PY(F137)	
-205	280										CA3106E-32-6PZ(F137)	

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
DWG NO Contract NAS 9-497
DRAWN SPLANE DATE 9 APR 65
CHECKED W. Diehl 14 APR '65
APPROVAL J. V. WEAN 14 APR '65
APPROVAL J. M. Watson 4-26-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
PIN CONTACT WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
NASA DRAWING NO. 1897232
SCALE
WT
SHEET 2 OF 4

TABLE III

CONTACT ARRANGEMENTS	VOLTAGE RATING (DC)	TEST VOLTAGE (RMS)
22-22	700	2000
28-10	1250 (G PIN)	2800
	700 (ALL OTHER)	2000
28-20	700	2000
32-6	700	2000
36-9	700	2000

TABLE II

CONTACT SIZE	MAX CURRENT RATING (AMP)	CONTACT RESISTANCE (MILLIVOLTS)
16	22	21
12	41	20
8	73	12
4	135	10

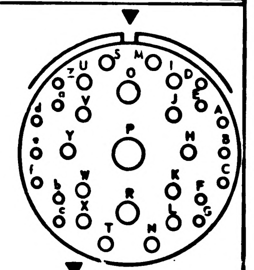
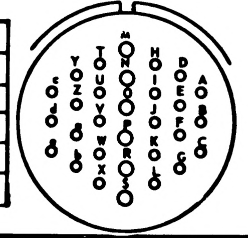
TABLE IV

CONTACT SIZE	DIMENSIONS
16	.0635-.0615
12	.095-.093
8	.143-.141
4	.226-.224

REVISIONS TDRR 21022

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		① SHT 3 REDRAWN PER MXC 201200 ② ADDED -251 THRU -255		20 MAY 65	R.W.T. EF
B		REVISED PER MXC-202415		21 JUN 65	SRA EF
C	—	REVISED PER TDRR 22914		11 OCT 65	JJJ EF

TABLE I (CONTINUED)

NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CON-TACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE	CABLE ENTRY MAX DIA	MAX OVER-ALL LENGTH	MAX NUT OUTER DIA	MAX CLAMP WIDTH	MAX DIAGONAL ACROSS CLAMP	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT (FACE VIEW)
					A	E	L	Q	SC	SC		
-226	0	31	14#16(A-G&Z-f)	36	2-1/4-16 UN-2B	1.375	2.953	2.47	2.270	2.875	CA3106E-36-9P (F137)	
-227	80		14#12(H-N&S-Y)								CA3106E-36-9PW(F137)	
-228	125		2#8(O&R)								CA3106E-36-9PX(F137)	
-229	235		1#4(P)								CA3106E-36-9PY(F137)	
-230	280										CA3106E-36-9PZ(F137)	
-251	0	30	24#16(A-L,T-Z & a-e)	32	2-18 NS-2B	1.250	2.953	2.22	2.030	2.531	CA3106E-32-8P (F137)	
-252	80										CA3106E-32-8PW(F137)	
-253	125										CA3106E-32-8PX(F137)	
-254	235		6#12(M-S)								CA3106E-32-8PY(F137)	
-255	280										CA3106E-32-8PZ(F137)	

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ − DECIMALS + ___ − ANGLES + _ −
DO NOT SCALE THIS DRAWING
MATERIAL
Contract NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN SPLANE DATE 9APR65
CHECKED DIEHL 14 APR 65
APPROVAL WEAN 14 APR 65
APPROVAL J. M. Watson 7-12-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
PIN CONTACT WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897232
SCALE —
SHEET 3 OF 4

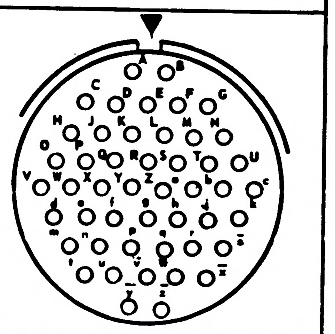
1897232 C

BHL 1077C-P

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	THIS SHEET ADDED PER TDRR 22914	11 OCT 65	J J J E.F.

TABLE I (CONTINUED)

NASA DASH NUMBER	DEGREES INSERT ROTATED FROM KEY	NO. OF CONTACTS	CONTACT SIZE	SHELL SIZE	COUPLING THREAD SIZE	CABLE ENTRY MAX DIA	MAX OVER-ALL LENGTH	MAX NUT OUTER DIA	MAX CLAMP WIDTH	MAX DIAGONAL ACROSS CLAMP	MANUFACTURER'S PART NUMBER (REF)	INSERT ARRANGEMENT (FACE VIEW)
					A	E	L	Q	SC	SC'		
-231	0	48	48 #16	36	2-1/4-16 UN-2B	1.375	2.953	2.47	2.270	2.875	CA3106E-36-10P(F137)	 A B C D E F G H J K L M N O P Q R S T U V W X Y Z a b c d e f g h j k m n p q r s t u v w x y z
-232	80										CA3106E-36-10PW(F137)	
-233	125										CA3106E-36-10PX(F137)	
-234	235										CA3106E-36-10PY(F137)	
-235	280										CA3106E-36-10PZ(F137)	

© THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

		DATE
DRAWN	SPLANE	5 APR 65
CHECKED	DIEHL	14 APR 65
APPROVAL	WEAN	14 APR 65
APPROVAL		

NASA APPROVAL

MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
PIN CONTACT WITH STRAIN RELIEF CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	C	1897232

SCALE — WT SHEET 4 OF 4

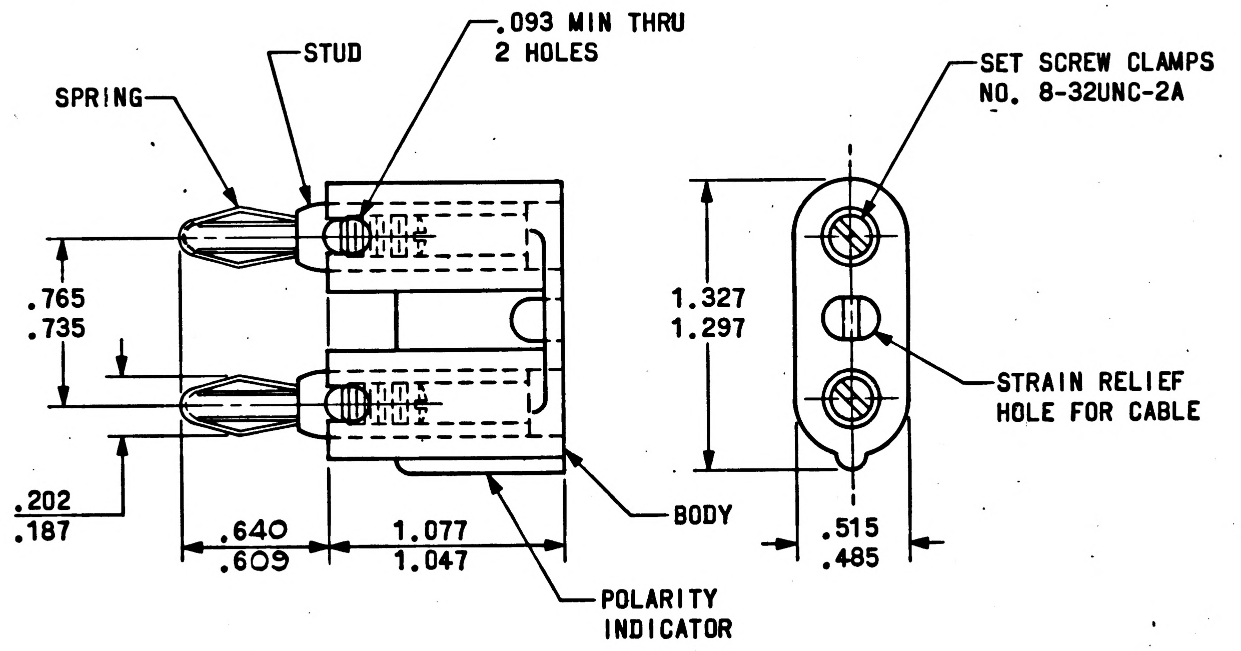
REVISIONS 23407					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 203353		27 JUL 65	WJR RWH
B		REVISED PER MXC 205775		19 OCT 65	JM EF
C		INITIAL RELEASE CLASS A PER TDRR 23.407		10-OCT-65	PT Fe

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) BODY: BLACK POLYSTYRENE.
       - (b) STUD: BRASS.
       - (c) SPRING: BERYLLIUM COPPER.
       - (d) SCREW: COLD ROLLED STEEL.
     - (2) FINISH:
       - (a) STUD: NICKEL PLATE.
       - (b) SPRING: NICKEL PLATE.
       - (c) SCREW: ZINC PLATE.
   - B. ELECTRICAL:
     - (1) CURRENT RATING: 15 AMP PEAK MAX.
     - (2) VOLTAGE RATING: 4000 V PEAK MAX.
     - (3) DIELECTRIC BREAKDOWN: 23,000 V PEAK AT IMA SENSITIVITY FOR ONE MINUTE.
     - (4) DISSIPATION FACTOR: .0005 MAX AT 1 KC.

NASA DASH NUMBER	MANUFACTURER'S PART NUMBER (REFERENCE)
-001	274-MB

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bender DATE 27-APR-65
CHECKED Ed Foster 29 APR 65
APPROVAL W. H. Wilson Jr. 29 APR 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PLUG ASSEMBLY, TIP - DOUBLE BANANA

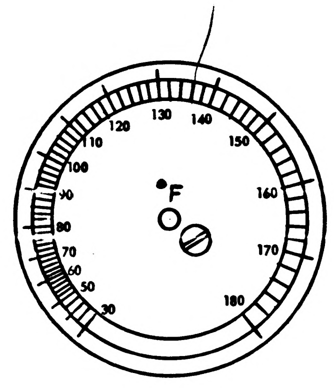
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897233
SCALE —
SHEET 1 of 1

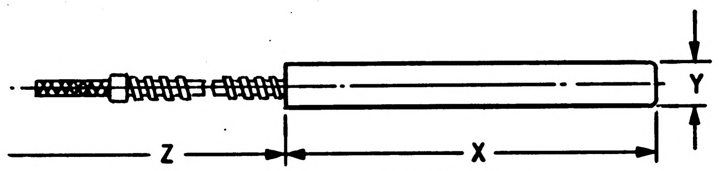
REVISIONS TDRR 21894					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADD "MIL-STD-129" TO NOTE 2.A.(3)(a). ADD "°F" TO DIAL MARKING PER		12 AUG 65	JEF

REQUIREMENTS:

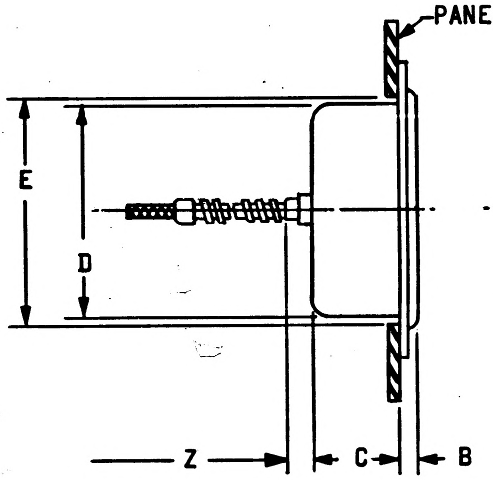
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL: DRAWN BLACK STEEL CASE WITH BLACK STEEL RING.
       - (a) CAPILLARY: DOUBLE SHEATH OF BRAIDED COPPER WIRE OVER COPPER CAPILLARY, BRASS SPIRAL REINFORCING AT BULB & CASE.
       - (b) BULB: COPPER ALLOY.
     - (2) FINISH: PRESS FIT RING - NICKEL OR CHROME PLATE.
     - (3) MARKING:
       - (a) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION: SUPPLIER'S NAME, NASA PART NUMBER, SUPPLIER'S LOT OR SERIAL NUMBER, DATE CODE, OR DATE OF MANUFACTURE PER MIL-STD-129.
       - (b) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.
3. DESIGN:
   - A. ACCURACY: ± 2% OF SCALE RANGE.
   - B. RECALIBRATION PROVISIONS.

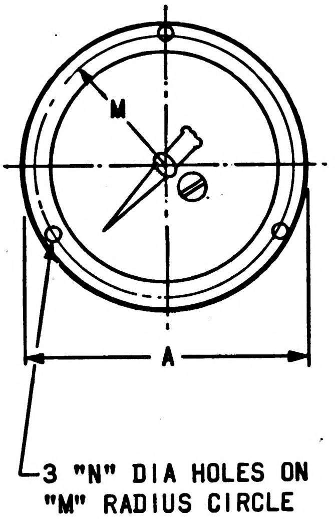


DIAL MARKING



PLAIN BULB





NASA DASH NUMBER	DIAL SIZE	CAPILLARY LENGTH Z	TEMP RANGE	A	B	C	D	E	M	N	X	Y
-1	2.50 (REF)	4.0' ±.1'	30-180°F	3.49 3.45	.11 .07	1.04 1.00	2.65 2.61	2.71 2.67	1.567 1.557	.16 .12	3.27 3.23	3.80 3.70

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Janowiak DATE 3 MAY 65
CHECKED W. Diehl 5 MAY '65
APPROVAL J.V. Wean 5 MAY '65
APPROVAL C. Sedmina '65
NASA APPROVAL
MIT APPROVAL 2-4-65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

THERMOMETER, INDICATING, CAPILLARY TUBE AND BULB

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897241
SCALE NONE
SHEET 1 of 1

REVISIONS 23393					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISION STATUS CHANGED		29 JUN 65	J.P. / JAC
B		REVISED PER MXC 203354		28 JUL 65	WJR / RWH
C		INITIAL RELEASE CLASS A PER TDRR 23393		18 OCT 65	JR

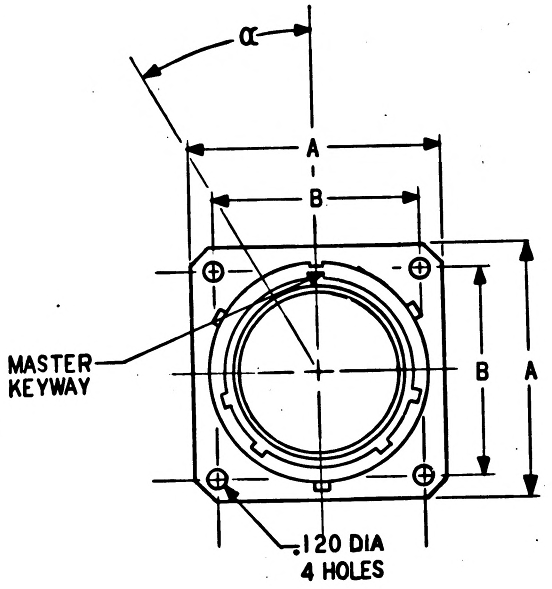
REQUIREMENTS:

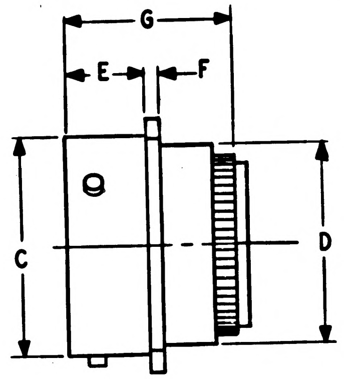
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482.
   - D. SOCKET CONTACTS PER 1897190 (100% MIN OF CONTACT CAVITIES) AND APPLICABLE SEALING PLUGS PER 1010958 (15% MIN OF CONTACT CAVITIES) TO BE SUPPLIED WITH EACH UNIT.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.
   - B. CONTACT WITHDRAWAL FORCE: PER 1897190.

3. DESIGN:
   - A. MATERIALS AND FINISHES:
     - (1) SHELL: ALUMINUM ALLOY AS REQUIRED PER MIL-C-26482. CLEAR CADMIUM FINISH.
     - (2) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH, OR EQUIVALENT.
     - (3) GROMMETS AND GASKETS: FLUORO SILICONE RUBBER.
   - B. MECHANICAL REQUIREMENTS:
     - (1) OPERATING TEMPERATURE: +125°C, MAX
     - (2) COUPLING MECHANISM: BAYONET LOCKING COUPLING.
     - (3) MAX ENGAGEMENT FORCE; MIN DISENGAGEMENT FORCE (WITH CONTACTS): PER TABLE
     - (4) CONTACT RETENTION: 20 LBS, MIN, IN DIRECTION OF MATING FORCE.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT, 1500 V RMS AT SEA LEVEL
     - (4) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C; 5000 MEGOHMS AT 125°C
     - (5) CONTACT RESISTANCE: 50 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM REAR OF PIN CRIMP BARREL TO REAR OF SOCKET CRIMP BARREL.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.





NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± —	±.005	± —

DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Gruber DATE 10-MAY 65
CHECKED C. Piojda 13 MAY 65
APPROVAL R. Trummer 13 May 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
SQUARE FLANGE, BAYONET LOCKING COUPLING
(CRIMP TYPE SOCKET CONTACTS)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897247
SCALE NONE
SHEET 1 of 3

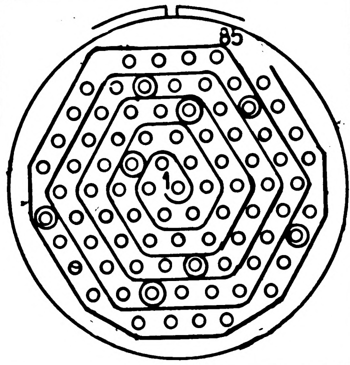
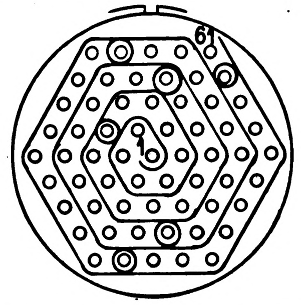
C7P

MIL 1077C—P

REVISIONS 23393					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 202416		29 JUN 65	J.P. JAC
B		REVISION STATUS CHANGED		28 JUL 65	WJR RWH
C		INITIAL RELEASE CLASS A PER TDRR 23393		18 OCT 65	JR

NOTES:

1. FOR MATING HALF SEE DRAWING 1897250.
2. FOR STRAIN RELIEF CLAMP SEE DRAWING 1010933.
3. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
4. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED ∝ DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
5. FOR SPARE CONTACTS SEE 1897190; FOR SPARE SEALING PLUGS SEE 1010958.

NASA DASH NUMBER	DEGREES ∝	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS							STANDARD INSERT ARRANGEMENT (FACE VIEW-SEE NOTE 4)	MAX ENG FORCE (IN-LBS)	MIN DISENG FORCE (IN-LBS)	MANUFACTURER'S PART NUMBER (REF)
				A MAX	B	C	D	E	F	G MAX				
-001	0	85	SOCKET	1.328	1.072 1.052	1.126 1.120	1.092 1.047	.462 .431	.087 .057	.802		28	5	STK00-18-85S
-002	W=225													STK00-18-85SW
-003	X=150													STK00-18-85SX
-004	Y=75													STK00-18-85SY
-005	0	61	SOCKET	1.234	.979 .959	1.001 .995	.972 .938	.462 .431	.087 .057	.802		24	4	STK00-16-61S
-006	W=225													STK00-16-61SW
-007	X=150													STK00-16-61SX
-008	Y=75													STK00-16-61SY

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Grabner DATE 10-MAY-65
CHECKED C. Pioda 13MAY65
APPROVAL R. Brummer 13 May 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL W Kupfer 20Oct65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

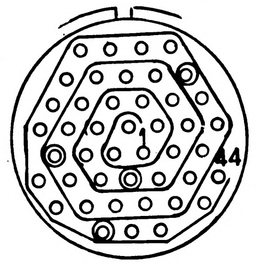
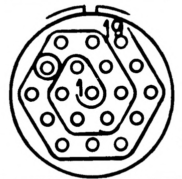
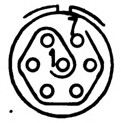
CONNECTOR, RECEPTACLE, ELECTRICAL—
SQUARE FLANGE, BAYONET LOCKING COUPLING
(CRIMP TYPE SOCKET CONTACTS)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897247
SCALE
SHEET 2 OF 3

MIL 1077C—P

1897247 | 3

REVISIONS 23393					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 202416		29 JUN 65	J.P. / JAC
B		REVISION STATUS CHANGED		28 JUL 65	WJR / RWH
C		INITIAL RELEASE CLASS A PER TDRR 23393		18 OCT 65	JR

NASA DASH NUMBER	DEGREES α	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS							STANDARD INSERT ARRANGEMENT- (FACE VIEW-SEE NOTE 4)	MAX ENG FORCE (IN-LBS)	MIN DISENG FORCE (IN-LBS)	MANUFACTURER'S PART NUMBER (REF)
				A MAX	B	C	D	E	F	G MAX				
-009	0	44	SOCKET	1.141	.916 .896	.876 .870	.847 .813	.462 .431	.087 .057	.802		20	4	STK00-14-44S
-010	W=225													STK00-14-44SW
-011	X=150													STK00-14-44SX
-012	Y=75													STK00-14-44SY
-013	0	19	SOCKET	.954	.729 .709	.591 .585	.581 .547	.462 .431	.087 .057	.802		12	1	STK00-10-19S
-014	W=225													STK00-10-19SW
-015	X=150													STK00-10-19SX
-016	Y=75													STK00-10-19SY
-017	0	7	SOCKET	.828	.604 .584	.474 .468	.468 .438	.462 .431	.087 .057	.802		8	1	STK00-8-7S
-019	150													STK00-8-7SX

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Gabner DATE 10-MAY-65
CHECKED C. Pizyda 13MAY65
APPROVAL R. Brunner 13May65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL - SQUARE FLANGE, BAYONET LOCKING COUPLING (CRIMP TYPE SOCKET CONTACTS)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 | SIZE C | 1897247
SCALE NONE | SHEET 3 OF 3

1897247 C

MIL 1077C-P

CJP

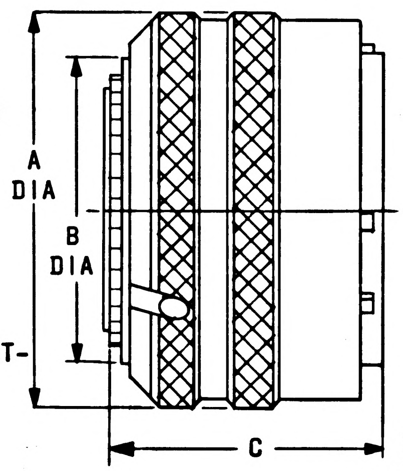
REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISION STATUS CHANGED		29/JUN 65	JW W.D.
B		REVISED PER MXC 203355		28 JUL 65	WJR RWH
C		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC FE

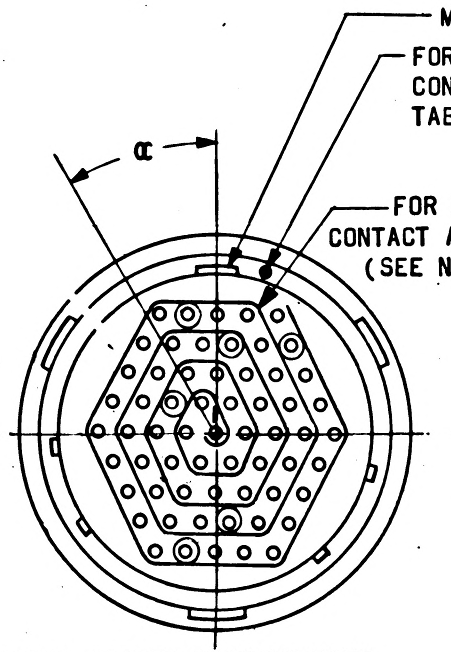
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP TYPE SOCKET CONTACTS PER 1897190 (100% MIN OF CONTACT CAVITIES) AND APPLICABLE SEALING PLUGS PER 1010958 (15% MIN OF CONTACT CAVITIES) TO BE SUPPLIED WITH EACH UNIT.

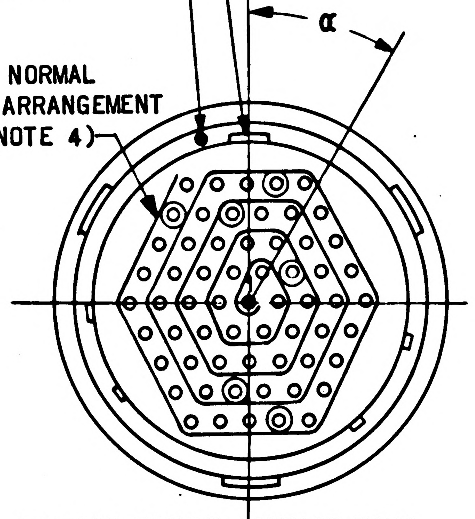
2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       SUPPLIER'S NAME
       NASA PART NUMBER
       DATE CODE, OR DATE OF MANUFACTURE
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.
   - B. CONTACT WITHDRAWAL FORCE: PER 1897190

3. DESIGN:
   - A. MATERIALS AND FINISHES:
     - (1) SHELL: ALUMINUM ALLOY AS REQUIRED PER MIL-C-26482. CLEAR CADMIUM FINISH.
     - (2) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH, OR EQUIVALENT.
     - (3) GROMMETS AND GASKETS: FLUORO SILICONE RUBBER.
   - B. MECHANICAL REQUIREMENTS:
     - (1) OPERATING TEMPERATURE: +125°C, MAX.
     - (2) COUPLING MECHANISM: BAYONET LOCKING COUPLING
     - (3) MAX ENGAGEMENT FORCE; MIN DISENGAGEMENT FORCE (WITH CONTACTS): PER TABLE I.
     - (4) CONTACT RETENTION: 20 LBS., MIN, IN DIRECTION OF MATING FORCE.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT., 1500 V RMS AT SEA LEVEL.
     - (4) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C, 500 VDC 5000 MEGOHMS AT 125°C, 500 VDC




α
MASTER KEY
FOR NUMBER OF CONTACTS SEE TABLE I
FOR NORMAL CONTACT ARRANGEMENT (SEE NOTE 4)

NORMAL SOCKET CONTACT VIEW
(FACE VIEW - FOR REF. ONLY)
FIGURE I



REVERSE SOCKET CONTACT VIEW
(FACE VIEW - FOR REF. ONLY)
FIGURE II

39

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN R.W. Turner DATE 13 MAY 65
CHECKED J. GRIEB 14 MAY 65
APPROVAL R. Trummer 17 May 65
APPROVAL L. Gelman 9/21/65
NASA APPROVAL A.C. Metzger
MIT APPROVAL 10/21/65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
BAYONET LOCKING COUPLING
(CRIMP TYPE SOCKET CONTACTS)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897249
SCALE NONE		SHEET 1 of 3

MIL 1077C—P

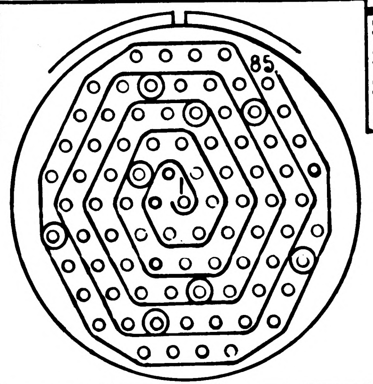
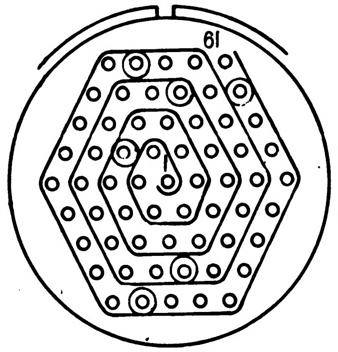
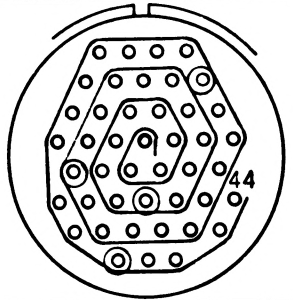
1897249

REVISIONS					23392
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 202417		29 JUN 65	JW W.N.
B		REVISED PER MXC 203355		28 JUL 65	WJR RWH
C		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	WRC

REQUIREMENTS: (CONTINUED)

(5) CONTACT RESISTANCE: 50 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM REAR OF PIN CONTACT CRIMP BARREL TO REAR OF SOCKET CONTACT CRIMP BARREL.

TABLE I

NASA DASH NUMBER FIGURE I	NO. OF CONTACT CAVITIES	α IN DEGREES	DIMENSIONS			MAX ENG FORCE (IN-LBS)	MIN DIS-ENG FORCE (IN-LBS)	CONTACT ARRANGEMENT (NORMAL POSITION—FACE VIEW)	MANUFACTURER'S PART NUMBER (REF)
			A MAX	B	C				
001 002 003 004	85	0 225 150 75	1.390	1.092 1.057	.905 .875	28	5		STK06-18-85S STK06-18-85SW STK06-18-85SX STK06-18-85SY
005 006 007 008	61	0 225 150 75	1.281	.967 .948	.905 .875	24	4		STK06-16-61S STK06-16-61SW STK06-16-61SX STK06-16-61SY
009 010 011 012	44	0 225 150 75	1.156	.851 .823	.905 .875	20	4		STK06-14-44S STK06-14-44SW STK06-14-44SX STK06-14-44SY

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R.W. Trummer DATE 13 MAY 65
CHECKED J. GRIEB 14 MAY 65
APPROVAL R. Trummer 17 May 65
APPROVAL C Gedeman 10/21/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

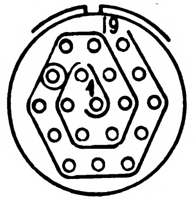
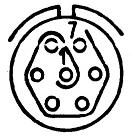
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

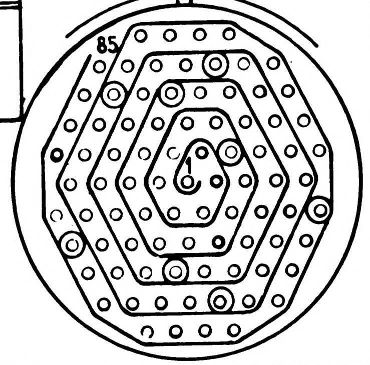
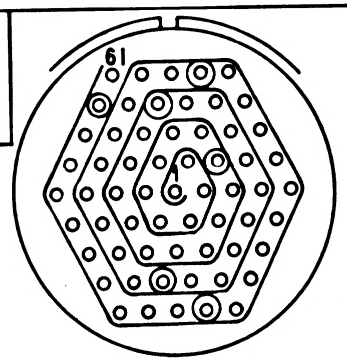
CONNECTOR, PLUG, ELECTRICAL—
BAYONET LOCKING COUPLING
(CRIMP TYPE SOCKET CONTACTS)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897249
SCALE
SHEET 2 of 3

MIL 1077C—P

TABLE I (CONTINUED)

NASA DASH NUMBER FIGURE I	NO. OF CONTACT CAVITIES	α IN DEGREES	DIMENSIONS A MAX	DIMENSIONS B	DIMENSIONS C	MAX ENG FORCE (IN-LBS)	MIN DIS-ENG FORCE (IN-LBS)	CONTACT ARRANGEMENT (NORMAL POSITION—FACE VIEW)	MANUFACTURER'S PART NUMBER (REF)
013 014 015 016	19	0 225 150 75	.859	.582 .557	.905 .875	12	1		STK06-10-19S STK06-10-19SW STK06-10-19SX STK06-10-19SY
017 - 019 -	7	0 - 150 -	.750	.461 .431	.905 .875	8	1		STK06-8-7S - STK06-8-7SX -

NASA DASH NUMBER FIGURE II	NO. OF CONTACT CAVITIES	α IN DEGREES	DIMENSIONS -A MAX	DIMENSIONS B	DIMENSIONS C	MAX ENG FORCE (IN-LBS)	MIN DIS-ENG FORCE (IN-LBS)	CONTACT ARRANGEMENT (NORMAL POSITION—FACE VIEW)	MANUFACTURER'S PART NUMBER (REF)
201 202 203 204	85	0 225 150 75	1.390	1.092 1.057	.905 .875	28	5		42084 -18-85S 42084 -18-85SW 42084 -18-85SX 42084 -18-85SY
205 206 207 208	61	0 225 150 75	1.281	.976 .948	.905 .875	24	4		42084 -16-61S 42084 -16-61SW 42084 -16-61SX 42084 -16-61SY

NOTES:

1. FOR MATING HALF SEE DRAWING 1897248 & 1897252
2. FOR STRAIN RELIEF CLAMP SEE DRAWING 1010933.
3. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
4. ALTERNATE POSITIONS: THE INSERT, AS SHOWN, IS ROTATED α DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
5. FOR SPARE CONTACTS SEE 1897190; FOR SPARE SEALING PLUGS SEE 1010958.

REVISIONS 23392

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 202417		29 JUN 65	JW W.D.
B		REVISED PER MXC 203355		28 JUL 65	WJR RWH
C		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC FE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
–	–	–

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. W. Turner DATE 13 MAY 65
CHECKED J. Gkiib 14 MAY 65
APPROVAL R. Brunner 17 May 65
APPROVAL L. Jedeman 1/8/65
NASA APPROVAL A C Metzger
MIT APPROVAL [illegible] 21 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
BAYONET LOCKING COUPLING
(CRIMP TYPE SOCKET CONTACTS)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897249
SCALE
SHEET 3 of 3

MIL 1077C—P

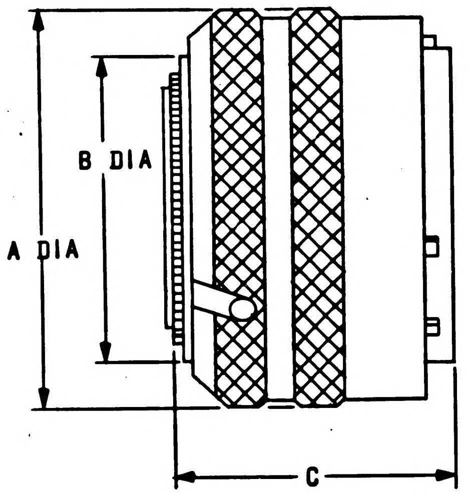
REVISIONS 23393					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 202418		29 JUN 65	SRA MEM
B		REVISED PEF. MXC 203356		27 JUL 65	RTP EF
C		INITIAL RELEASE CLASS A PER TDRR 23393		18 OCT 65	JR JE

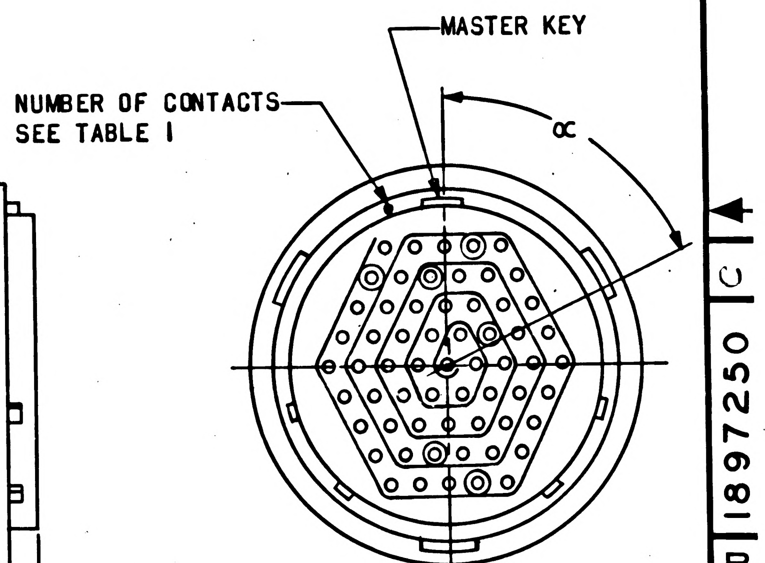
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP TYPE PIN CONTACTS PER 1897190 (100% MIN OF CONTACT CAVITIES) AND APPLICABLE SEALING PLUGS PER 1010958 (15% MIN OF CONTACT CAVITIES TO BE SUPPLIED WITH EACH UNIT.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE, OR DATE OF MANUFACTURE
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. MATERIALS AND FINISHES:
     - (1) SHELL: ALUMINUM ALLOY AS REQUIRED PER MIL-C-26482. CLEAR CADMIUM FINISH.
     - (2) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH, OR EQUIVALENT.
     - (3) GROMMETS AND GASKETS: FLUORO SILICONE RUBBER.
   - B. MECHANICAL REQUIREMENTS:
     - (1) OPERATING TEMPERATURE: +125°C, MAX
     - (2) COUPLING MECHANISM: BAYONET LOCKING COUPLING
     - (3) MAX ENGAGEMENT FORCE; MIN DISENGAGEMENT FORCE (WITH CONTACTS): PER TABLE I.
     - (4) CONTACT RETENTION: 20 LBS., MIN, IN DIRECTION OF MATING FORCE.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C, 500 VDC 5000 MEGOHMS AT 125°C, 500 VDC





NORMAL CONTACT ARRANGEMENT
(FACE VIEW- FOR REF ONLY)
SEE NOTE 4

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Graham DATE 14 MAY 65
CHECKED R. Fesler 14 MAY 65
APPROVAL P. Trimmer 17 May 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL A. C. Metzger
MIT APPROVAL W. Kupfer 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
BAYONET LOCKING COUPLING
(CRIMP TYPE PIN CONTACTS)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897250
SCALE NONE
SHEET 1 of 3

MIL 1077C—P

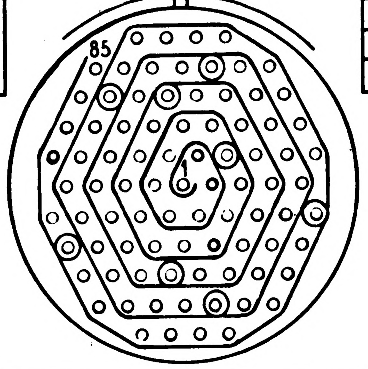
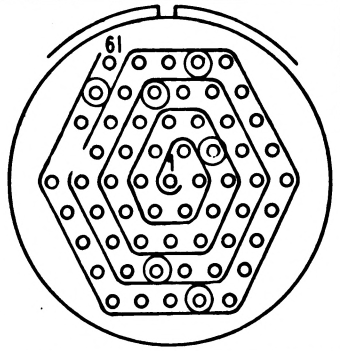
NOTES:

1. FOR MATING HALF SEE DRAWING 1897247
2. FOR STRAIN RELIEF CLAMP SEE DRAWING 1010933.
3. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
4. ALTERNATE POSITIONS: THE INSERT, AS SHOWN, IS ROTATED α DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
5. FOR SPARE CONTACTS SEE 1897190; FOR SPARE SEALING PLUGS SEE 1010958.

REVISIONS 23393

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 202418		29 JUN 65	SRA MEM
B		REVISED PER MXC 203356		27 JUL 65	RTP EF
C		INITIAL RELEASE CLASS A PER TDRR 23393		18 OCT 66	JR

TABLE I

NASA DASH NUMBER	NO. OF CONTACT CAVITIES	α DEGREES	DIMENSIONS			MAX ENG FORCE (IN-LBS)	MIN DIS-ENG FORCE (IN-LBS)	CONTACT ARRANGEMENT (NORMAL POSITION—FACE VIEW)	MANUFACTURER'S PART NUMBER (REF)
			A MAX	B	C				
-001	85	0	1.390	1.092 1.057	.905 .875	28	5		STK06-18-85P
-002		225							STK06-18-85PW-
-003		150							STK06-18-85PX-
-004		75							STK06-18-85PY-
-005	61	0	1.281	.967 .948	.905 .875	24	4		STK06-16-61P
-006		225							STK06-16-61PW-
-007		150							STK06-16-61PX-
-008		75							STK06-16-61PY-

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Gubin DATE 14 MAY 65
CHECKED Fesler 14 MAY 65
APPROVAL R. Trummer 17 May 65
APPROVAL J. M. Watson 10-16-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

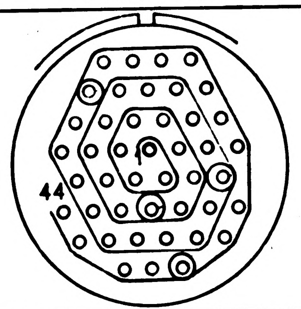
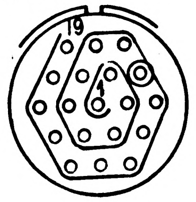
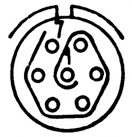
CONNECTOR, PLUG, ELECTRICAL—
BAYONET LOCKING COUPLING
(CRIMP TYPE PIN CONTACTS)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897250
SCALE NONE
SHEET 2 of 3

MIL 1077C—P

REVISIONS 23393					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 202418		29 JUN 65	SRA / MEM
B		REVISED PER MXC 203356		27 JUL 65	RTP / EF
C		INITIAL RELEASE CLASS A PER TDRR 23393		18 OCT 65	JR

TABLE I (CONTINUED)

NASA DASH NUMBER	NO. OF CONTACT CAVITIES	∝ DEGREES	DIMENSIONS A MAX	DIMENSIONS B	DIMENSIONS C	MAX ENG FORCE (IN-LBS)	MIN DIS-ENG FORCE (IN-LBS)	CONTACT ARRANGEMENT (NORMAL POSITION— FACE VIEW)	MANUFACTURER'S PART NUMBER (REF)
-009	44	0	1.156	.851 .823	.905 .875	20	4		STK06-14-44P
-010		225							STK06-14-44PW
-011		150							STK06-14-44PX
-012		75							STK06-14-44PY
-013	19	0	.859	.582 .557	.905 .875	12	1		STK06-10-19P
-014		225							STK06-10-19PW
-015		150							STK06-10-19PX
-016		75							STK06-10-19PY
-017	7	0	.750	.461 .431	.905 .875	8	1		STK06-8-7P
-019		150							STK06-8-7PX

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 14-MAY-65
CHECKED Fesler 14 MAY65
APPROVAL R Trummer 17 May 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
BAYONET LOCKING COUPLING
(CRIMP TYPE PIN CONTACTS)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897250
SCALE NONE		SHEET 3 of 3

MIL 1077C—P

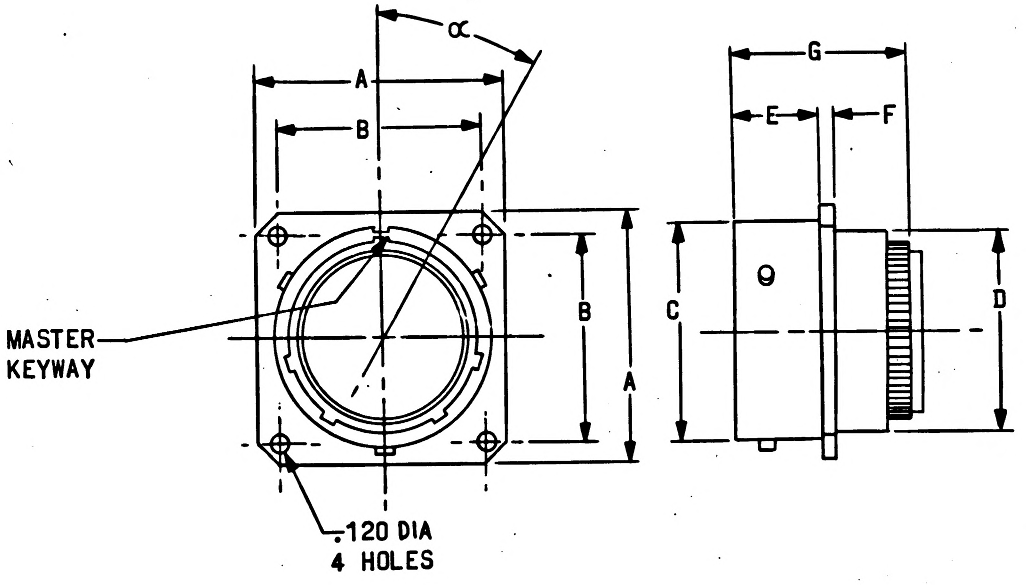
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
		REVISIONS 23392			
A		REVISION STATUS CHANGED PER MXC-202419		30-JUN-65	A.F.W. mom
B		REVISED PER MXC 203357		27 JUL 65	RLP EF
C		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482.
   - D. PIN CONTACTS PER 1897190 (100% MIN OF CONTACT CAVITIES) AND APPLICABLE SEALING PLUGS PER 1010958 (15% MIN OF CONTACT CAVITIES) TO BE SUPPLIED WITH EACH UNIT.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       SUPPLIER'S NAME
       NASA PART NUMBER
       DATE CODE OR DATE OF MANUFACTURE
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. MATERIALS AND FINISHES:
     - (1) SHELL: ALUMINUM ALLOY AS REQUIRED PER MIL-C-26482. CLEAR CADMIUM FINISH
     - (2) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH, OR EQUIVALENT.
     - (3) GROMMETS AND GASKETS: FLUORO SILICONE RUBBER.
   - B. MECHANICAL REQUIREMENTS:
     - (1) OPERATING TEMPERATURE: +125°C, MAX
     - (2) COUPLING MECHANISM: BAYONET LOCKING COUPLING.
     - (3) MAX ENGAGEMENT FORCE; MIN DISENGAGEMENT FORCE (WITH CONTACTS): PER TABLE I.
     - (4) CONTACT RETENTION: 20 LBS, MIN, IN DIRECTION OF MATING FORCE.
   - C. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT, 1500 V RMS AT SEA LEVEL.
     - (4) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C; 5000 MEGOHMS AT 125°C.
     - (5) CONTACT RESISTANCE: 50 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM REAR OF PIN CRIMP BARREL TO REAR OF SOCKET CRIMP BARREL.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

39

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± .005 ANGLES ± ——
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Gruber DATE 12-May-65
CHECKED C. Pioyda 13 MAY 65
APPROVAL R. Trummer 13 May 65
APPROVAL L. Gediman 10/21/65
NASA APPROVAL C.C. Metzger
MIT APPROVAL W. Kupfer 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL -
SQUARE FLANGE, BAYONET LOCKING COUPLING
(CRIMP TYPE PIN CONTACTS)
SPECIFICATION CONTROL DRAWINGS

CODE IDENT NO. 99974 SIZE C 1897252
SCALE NONE SHEET 1 OF 3

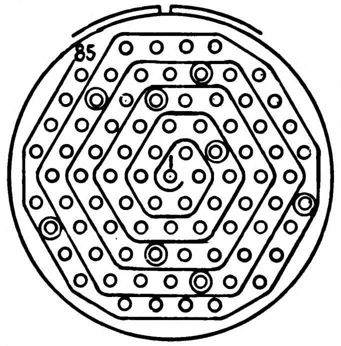
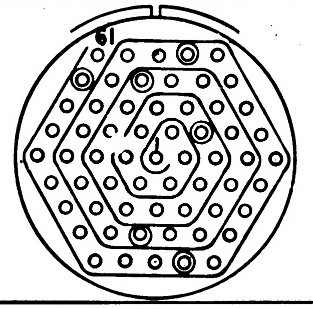
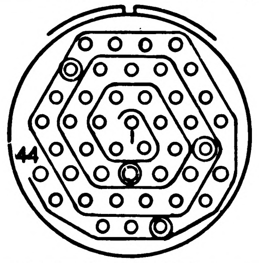
MIL 1077C—P

CJP

REVISIONS					23392
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	—	REVISED PER MXC-202419		30-JUN-65	A.F.W. MEM
B		REVISION STATUS CHANGED		27 JUL 65	RLP EF
C		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC FE

NOTES:

1. FOR MATING HALF SEE DRAWING 1897249 (NORMAL CONTACT, FIG. 1)
2. FOR STRAIN RELIEF CLAMP SEE DRAWING 1010933.
3. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
4. ALTERNATE POSITIONS; THE INSERT, AS SHOWN IS ROTATED ∝ DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
5. FOR SPARE CONTACTS SEE 1897190; FOR SPARE SEALING PLUGS SEE 1010958.

NASA DASH NUMBER	DEGREES ∝	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS							STANDARD INSERT ARRANGEMENT (FACE VIEW-SEE NOTE 4)	MAX ENG FORCE (IN-LBS)	MIN DISENG FORCE (IN-LBS)	MANUFACTURER'S PART NUMBER (REF)
				A MAX	B	C	D	E	F	G MAX				
-101	0	85	PIN	1.328	1.072 1.052	1.126 1.120	1.092 1.047	.462 .431	.087 .057	.802	 85	28	5	STK00-18-85P
-102	W=225													STK00-18-85PW
-103	X=150													STK00-18-85PX
-104	Y=75													STK00-18-85PY
-105	0	61	PIN	1.234	.979 .959	1.001 .995	.972 .938	.462 .431	.087 .057	.802	 61	24	4	STK00-16-61P
-106	W=225													STK00-16-61PW
-107	X=150													STK00-16-61PX
-108	Y=75													STK00-16-61PY
-109	0	44	PIN	1.141	.916 .896	.876 .870	.847 .813	.462 .431	.087 .057	.802	 44	20	4	STK00-14-44P
-110	W=225													STK00-14-44PW
-111	X=150													STK00-14-44PX
-112	Y=75													STK00-14-44PY

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Graber DATE 12-MAY-65
CHECKED C. Piojda 13 MAY 65
APPROVAL R. Trummer 13 May 65
APPROVAL D. Hensley 13 MAY 65
NASA APPROVAL J C Metzger
MIT APPROVAL W Ruff 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL - SQUARE FLANGE, BAYONET LOCKING COUPLING (CRIMP TYPE PIN CONTACTS)

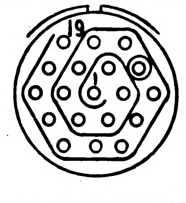
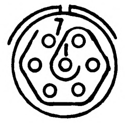
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897252
SCALE NONE SHEET 2 OF 3

MIL 1077C-P

C7P

REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC-202419		30-JUN-65	H.F.W. MGM
B		REVISION STATUS CHANGED		27 JUL 65	RLP EF
C		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC FE

NASA DASH NUMBER	DEGREES ∝	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS							STANDARD INSERT ARRANGEMENT (FACE VIEW-SEE NOTE 4)	MAX ENG FORCE (IN-LBS)	MIN DISENG FORCE (IN-LBS)	MANUFACTURER'S PART NUMBER (REF)
				A MAX	B	C	D	E	F	G MAX				
-113	0	19	PIN	.954	.729 .709	.591 .585	.581 .547	.462 .431	.087 .057	.802		12	1	STK00-10-19P
-114	W=225													STK00-10-19PW
-115	X=150													STK00-10-19PX
-116	Y=75													STK00-10-19PY
-117	0	7	PIN	.828	.604 .584	.474 .468	.468 .438	.462 .431	.087 .057	.802		8	1	STK00-8-7P
-119	150													STK00-8-7PX

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Gruber DATE 12-May-65
CHECKED C. Pioda 13MAY65
APPROVAL R. Trimmer 13 May 65
APPROVAL D. Hensley 13 MAY 65
NASA APPROVAL A.G. Metzger
MIT APPROVAL W. Kupfer 21 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL -
SQUARE FLANGE, BAYONET LOCKING COUPLING
(CRIMP TYPE PIN CONTACTS)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897252
SCALE NONE
SHEET 3 OF 3

MIL 1077C—P

C7P

REVISIONS 23407

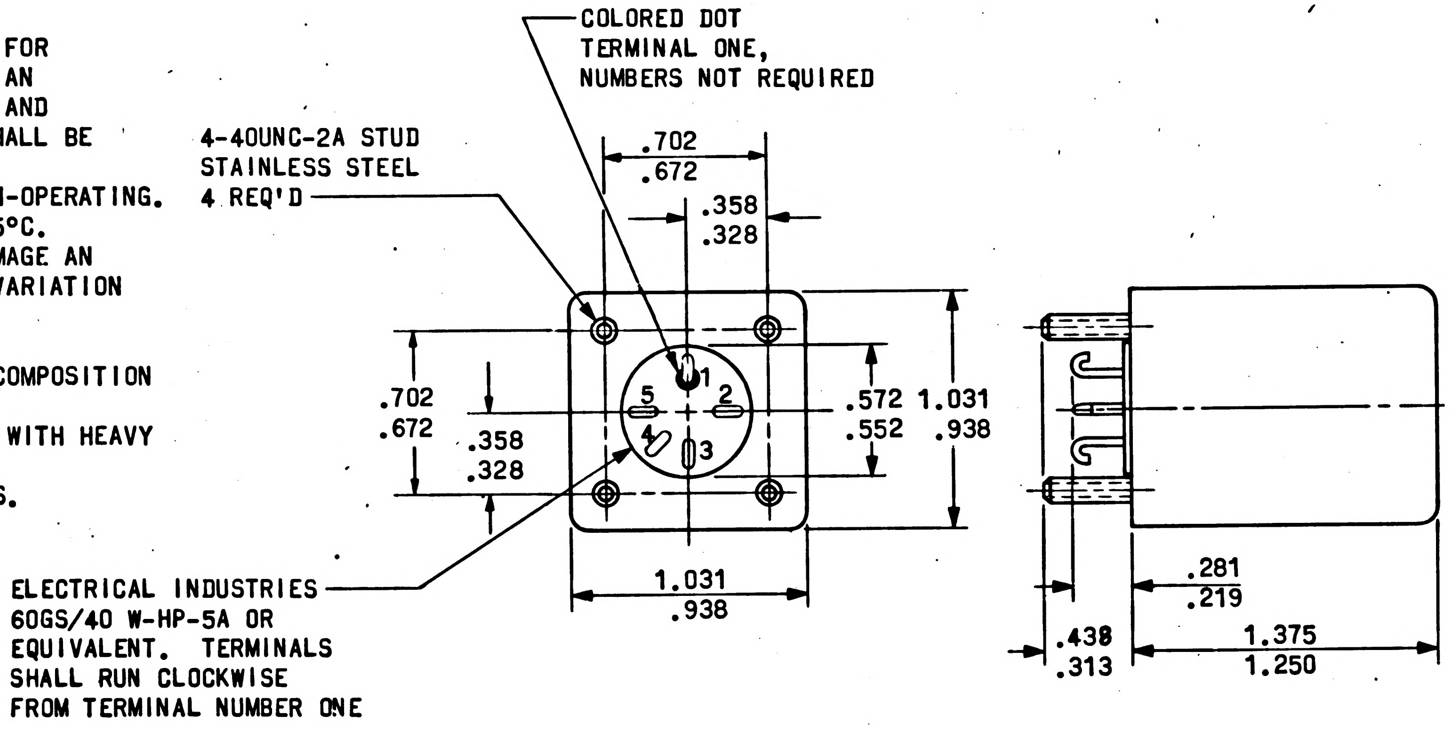
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23407		18 OCT 65	PT

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. DESIGN TO BE IN CONFORMANCE WITH SPECIFICATION MIL-T-27.
   - D. RAYTHEON CO. PART NUMBER 160931 (FOR REF).
   - E. TRANSFORMER DESIGN PART NUMBER TD-1000 (FOR REF).

2. INSPECTION AND ACCEPTANCE:
   - A. UNIT SHALL MEET ALL REQUIREMENTS OF TABLE I.
   - B. COLOR: UNIT SHALL BE FINISHED WITH COLOR 514 OF ANA BULLETIN 157 (INSTRUMENT BLACK).
   - C. MARKING: MARK PERMANENTLY AND LEGIBLY PER ND 1002019 WITH THE NASA DRAWING NUMBER PLUS ALL MARKING REQUIREMENTS OF MIL-T-27. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON PART AND PACKAGE.

3. DESIGN:
   - A. THE UNIT SHALL MEET ALL REQUIREMENTS OF MIL-T-27 FOR GRADE 4, CLASS R, LIFE EXPECTANCY X FAMILY 09 IN AN AMBIENT TEMPERATURE OF 65°C EXCEPT PARAGRAPH 3.1 AND LIFE TEST UNDER GROUP C INSPECTION TESTS WHICH SHALL BE WAIVED.
   - B. ALTITUDE: 10,000 FEET OPERATING, 50,000 FEET NON-OPERATING.
   - C. AMBIENT OPERATING TEMPERATURE RANGE: 0°C TO + 65°C.
   - D. UNIT SHALL BE CAPABLE OF WITHSTANDING WITHOUT DAMAGE AN INPUT VOLTAGE VARIATION OF ±10% AND A FREQUENCY VARIATION OF ±32 CPS.
   - E. DC UNBALANCE IN PRIMARY: 20 MA MAXIMUM.
   - F. SOLDER USED FOR ELECTRICAL CONNECTIONS SHALL BE COMPOSITION SN 60 PER QQ-S-571C.
   - G. UNIT SHALL BE LAYER WOUND (A BOBBIN MAY BE USED) WITH HEAVY VINYL ACETAL RESIN OR EQUIVALENT.
   - H. MAXIMUM WORKING VOLTAGE: 175 VOLTS INSTANTANEOUS.


COLORED DOT
TERMINAL ONE,
NUMBERS NOT REQUIRED
4-40UNC-2A STUD
STAINLESS STEEL
4 REQ'D
.702
.672
.358
.328
.702
.672
.358
.328
1
2
3
4
5
.572
.552
1.031
.938
1.031
.938
ELECTRICAL INDUSTRIES
60GS/40 W-HP-5A OR
EQUIVALENT. TERMINALS
SHALL RUN CLOCKWISE
FROM TERMINAL NUMBER ONE
.281
.219
.438
.313
1.375
1.250

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN ART NIKURS DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL E. Fuller 10 Jun 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, POWER, STEP-DOWN
AND STEP-UP -
10-30/2.04 VOLTS, 3200 CPS, 92 MW
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897253
SCALE NONE
SHEET 1 OF 2

MIL 1077C-P

E.F

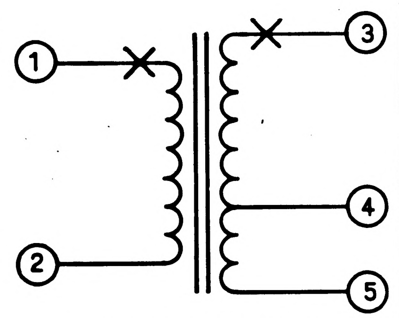
REVISIONS 23907					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23907		18 OCT 65	

TABLE I
INSPECTION TESTS

TITLES IN PARAGRAPH COLUMN REFER TO TITLES IN SPECIFICATION MIL-T-27

PARAGRAPH	
SEALING	IMMERSE IN LIQUID AS INDICATED.
DIELECTRIC STRENGTH	APPLY 500 VOLTS BETWEEN WINDINGS AND BETWEEN WINDINGS AND CASE.
INDUCED VOLTAGE	APPLY 20 VOLTS (RMS) 6400 CPS (1-2), SECONDARY OPEN.
INSULATION RESISTANCE	10,000 MEGOHMS MINIMUM AT 25°C.
RATED LOAD	1. WITH AN INPUT (1-2) OF 10 VOLTS, 3200 CPS THE FULL LOAD OUTPUT VOLTAGE SHALL BE: a. V(3-5) = 30.00 ± 0.60 VOLTS WITH A LOAD (3-5) OF 3 MA. b. V(4-5) = 2.04 ± 0.04 VOLTS WITH A LOAD (4-5) OF 1.02 MA. LOADS ARE SIMULTANEOUS c. $\frac{\text{VOLTAGE MEASURED IN 1.a.}}{\text{VOLTAGE MEASURED IN 1.b.}} = 14.70 \pm 1\%$
DC RESISTANCE AT 25°C	$R_{(1-2)}$ = 15 OHMS MAXIMUM; $R_{(3-5)}$ = 30 OHMS MAXIMUM $R_{(4-5)}$ = 3 OHMS MAXIMUM.
PRIMARY OPEN CIRCUIT INDUCTANCE	SHALL BE 75 MILLIHENRIES MINIMUM (1-2) WITH 10 VOLTS, 3200 CPS, 20 MADC (1-2), SECONDARY OPEN.
	LEAKAGE INDUCTANCE: (3.2 KC) L(1-2) WITH (3-5) SHORTED SHALL BE 0.3 M.H. MAX. L(1-2) WITH (4-5) SHORTED SHALL BE 1.2 M.H. MAX.
POLARITY	TERMINALS 1 AND 3 SHALL BE OF LIKE POLARITY.

VOLTAGES AND CURRENTS ARE RMS VALUES UNLESS OTHERWISE SPECIFIED



SCHEMATIC DIAGRAM

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN ART NIKURS DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL E. Fulley 10 JUN 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, POWER, STEP-DOWN
AND STEP-UP -
10-30/2.04 VOLTS, 3200 CPS, 92 MW
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897253
SCALE
SHEET 2 OF 2

1897253 A

MIL 1077C-P

REVISIONS TDRR 21078					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER TDRR 22490		22SEP 65	RLP / EF

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-R-27208A.

2. INSPECTION AND ACCEPTANCE:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) TOTAL RESISTANCE: PER TABLE I AND II.
     - (2) TOLERANCE: ± 5%.
     - (3) ABSOLUTE MINIMUM RESISTANCE:
       - (a) 10 TO 1000 OHMS: 0 TO 0.2% OR 0 TO 0.5 OHMS, WHICHEVER IS GREATER.
       - (b) 2000 TO 50,000 OHMS: 0 TO 0.1%.
       - (c) 100,000 OHMS: 0 TO 5.0%.
     - (4) NOISE DURING ADJUSTMENT: 100 OHMS ENR MAXIMUM PER MIL-R-27208A.
   - B. MECHANICAL REQUIREMENTS:
     - (1) HARDWARE: EACH RESISTOR SHALL HAVE A STANDARD HEX MOUNTING NUT (NO. 10-32, NF-2 THD 1/4 FLATS X .073 THK) AND A NO. 10 SPRING LOCKWASHER.
     - (2) MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME OR SYMBOL, THE NASA PART NUMBER AND THE RESISTANCE VALUE.

3. DESIGN:
   - A. POWER RATINGS:
     - (1) 1.0 WATT AT 70°C.
     - (2) 0.5 WATT AT 125°C.
     - (3) 0 WATT AT 175°C.
   - B. OPERATING TEMPERATURE RANGE: -65°C TO +175°C.
   - C. TEMPERATURE CO-EFFICIENT OF RESISTANCE ELEMENT (PER MIL-R-27208A): .005%/°C MAX.
   - D. RESOLUTION: PER TABLE I AND II.
   - E. MECHANICAL ADJUSTMENT: 22 TURNS NOMINAL.
   - F. ADJUSTMENT SCREW TORQUE: 5.0 OZ-IN. MAX.
   - G. INSULATION RESISTANCE (500 VDC): 1000 MEGOHMS MIN.
   - H. DIELECTRIC STRENGTH (PER MIL-R-27208A)
     - (1) ROOM CONDITIONS: 1500 VAC.
   - I. MECHANICAL STOPS: WIPER ASSEMBLY IDLES.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER'S LIST.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+ .005	+
−	−	−
	± .02	

DO NOT SCALE THIS DRAWING

MATERIAL NONE

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 25 MAY 65
CHECKED Ed Foster 28MAY65
APPROVAL J. Urban 28 May 65
APPROVAL J. M. Watson 7-15-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE
WIREWOUND, 1 WATT
(PANEL MOUNT)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897260
SCALE NONE		SHEET 1 OF 3

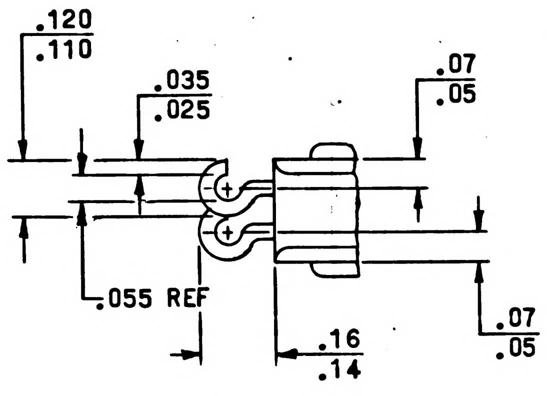
REVISIONS *TDRR 21078*

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER TDRR 22490		22 SEP 65	RLP / EF

TABLE I
(SOLDER LUG CONFIGURATION FIGURE 1)

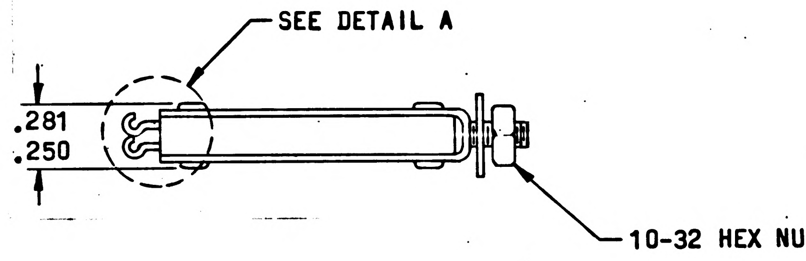
NASA DASH NUMBER	RESISTANCE (OHMS) ±5%	NOMINAL RESOLUTION (PERCENT)
-001	10	2.0
-002	20	1.7
-003	50	1.2
-004	100	1.0
-005	200	0.8
-006	500	0.7
-007	1000	0.5
-008	2000	0.4
-009	5000	0.35
-010	10,000	0.25
-011	20,000	0.20
-012	25,000	0.20
-013	50,000	0.17
-014	100,000	0.17

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

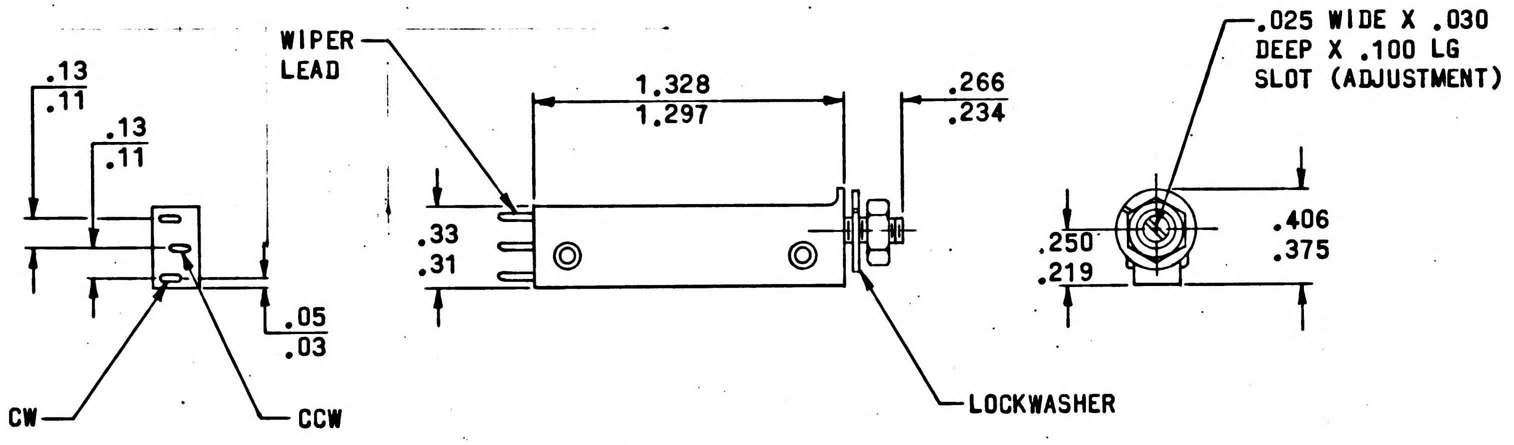


.120
.110
.035
.025
.07
.05
.055 REF
.16
.14
.07
.05

DETAIL A

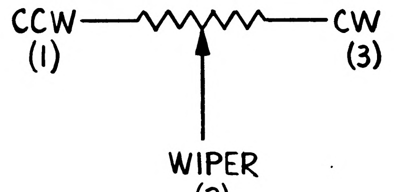


SEE DETAIL A
.281
.250
10-32 HEX NUT



.13
.11
.13
.11
WIPER LEAD
.05
.03
CW
CCW
1.328
1.297
.266
.234
.33
.31
LOCKWASHER
.025 WIDE X .030 DEEP X .100 LG SLOT (ADJUSTMENT)
.250
.219
.406
.375

SOLDER LUG CONFIGURATION FIGURE I (TABLE I)



CCW
(1)
CW
(3)
WIPER
(2)

GRAPHICAL SYMBOL

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±
DECIMALS ±.005 ±.02
ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Yamasaki DATE 25 MAY 65
CHECKED Ed Foster 28 MAY 65
APPROVAL J. Ulbar 28 May 65
APPROVAL J. M. Watson 7-15-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

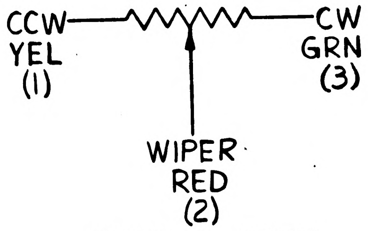
RESISTOR, VARIABLE
WIREWOUND, 1 WATT
(PANEL MOUNT)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897260
SCALE
SHEET 2 OF 3

REVISIONS TDRR 21078					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER TDRR 22490		22 SEP 65	RLP / EF

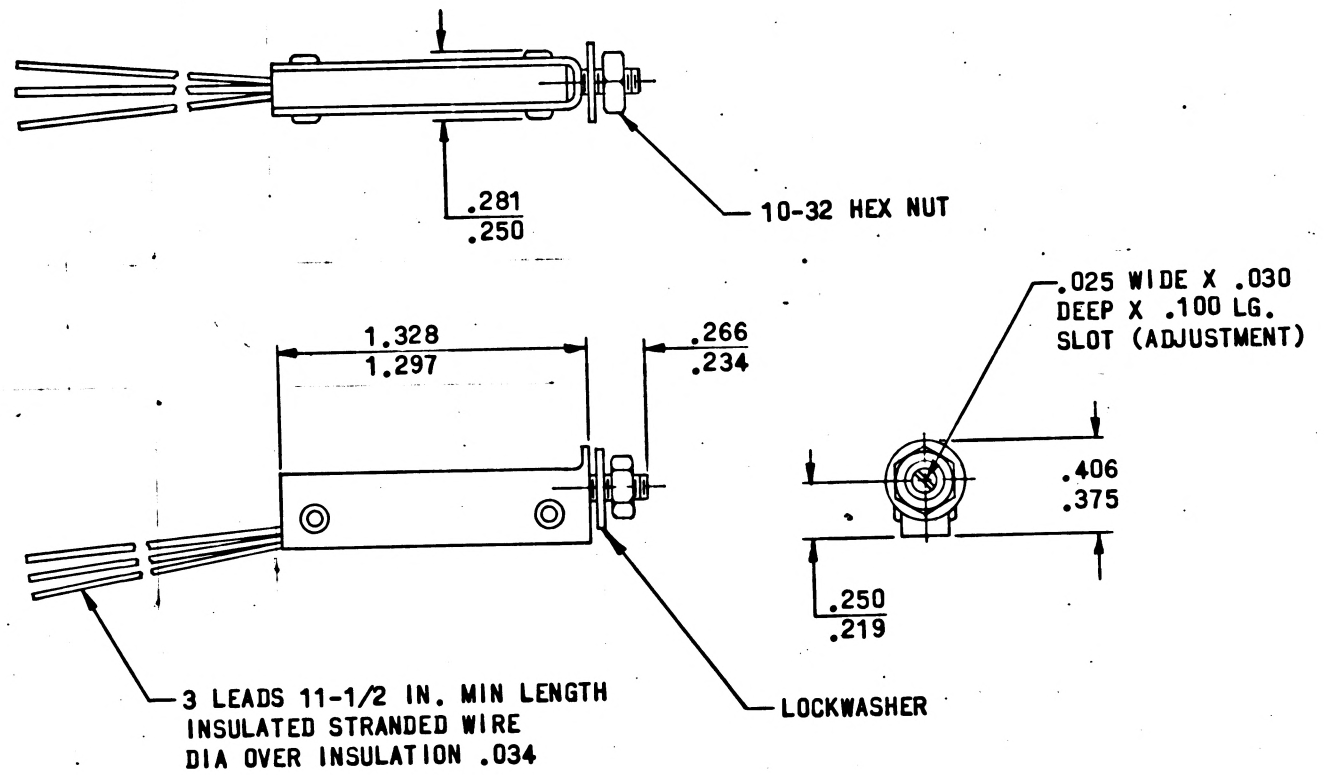
TABLE II
(WIRE LEAD CONFIGURATION FIGURE II)

NASA DASH NUMBER	RESISTANCE (OHMS) ±5%	NOMINAL RESOLUTION (PERCENT)
-015	10	2.0
-016	20	1.7
-017	50	1.2
-018	100	1.0
-019	200	0.8
-020	500	0.7
-021	1000	0.5
-022	2000	0.4
-023	5000	0.35
-024	10,000	0.25
-025	20,000	0.20
-026	25,000	0.20
-027	50,000	0.17
-028	100,000	0.17



CCW
YEL
(1)
CW
GRN
(3)
WIPER
RED
(2)

GRAPHICAL SYMBOL



.281
.250
10-32 HEX NUT
1.328
1.297
.266
.234
.025 WIDE X .030 DEEP X .100 LG. SLOT (ADJUSTMENT)
.406
.375
.250
.219
3 LEADS 11-1/2 IN. MIN LENGTH INSULATED STRANDED WIRE DIA OVER INSULATION .034
LOCKWASHER

WIRE LEAD CONFIGURATION FIGURE II (TABLE II)

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
±	± .005 ± .02	±

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN M. Yanowski DATE 25 MAY 65
CHECKED Ed Foster 28 MAY 65
APPROVAL J. Urban 28 May 65
APPROVAL J. McWhorter 7-15-65
NASA APPROVAL 7-21-65
MIT APPROVAL 21 Jul 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE
WIREWOUND, 1 WATT
(PANEL MOUNT)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897260
SCALE		SHEET 3 OF 3

MIL 1077C-P

REVISIONS *TDRR 21078*

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-R-27208A.

2. INSPECTION AND ACCEPTANCE:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) TOTAL RESISTANCE: PER TABLE I AND II.
     - (2) TOLERANCE: ± 5%.
     - (3) ABSOLUTE MINIMUM RESISTANCE:
       - (a) 10 TO 1000 OHMS: 0 TO 0.2% OR 0 TO 0.5 OHMS, WHICHEVER IS GREATER.
       - (b) 2000 TO 50,000 OHMS: 0 TO 0.1%.
       - (c) 100,000 OHMS: 0 TO 5.0%.
     - (4) NOISE DURING ADJUSTMENT: 100 OHMS ENR MAXIMUM PER MIL-R-27208A.
   - B. MECHANICAL REQUIREMENTS:
     - (1) HARDWARE: EACH RESISTOR SHALL HAVE A STANDARD HEX MOUNTING NUT (NO. 10-32, NF-2 THD 1/4 FLATS X .073 THK) AND A NO. 10 SPRING LOCKWASHER.
     - (2) MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME OR SYMBOL, THE NASA PART NUMBER AND THE RESISTANCE VALUE.

3. DESIGN:
   - A. POWER RATINGS:
     - (1) 1.0 WATT AT 70°C.
     - (2) 0.5 WATT AT 125°C.
     - (3) 0 WATT AT 175°C.
   - B. OPERATING TEMPERATURE RANGE: -65°C TO +175°C.
   - C. TEMPERATURE CO-EFFICIENT OF RESISTANCE ELEMENT (PER MIL-R-27208A): .005%/°C MAX.
   - D. RESOLUTION: PER TABLE I AND II.
   - E. MECHANICAL ADJUSTMENT: 22 TURNS NOMINAL.
   - F. ADJUSTMENT SCREW TORQUE: 5.0 OZ-IN. MAX.
   - G. INSULATION RESISTANCE (500 VDC): 1000 MEGOHMS MIN.
   - H. DIELECTRIC STRENGTH (PER MIL-R-27208A)
     - (1) ROOM CONDITIONS: 1500 VAC.
   - I. MECHANICAL STOPS: WIPER ASSEMBLY IDLES.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ±.02 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL NONE
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 25 MAY 65
CHECKED Ed Foster 28MAY65
APPROVAL J. Urban 28 May 65
APPROVAL J. M. Watson 7-15-65
NASA APPROVAL [illegible] 7/21/65
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE
WIREWOUND, 1 WATT
(PANEL MOUNT)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897260
SCALE NONE
SHEET 1 OF 3

MIL 1077C-P

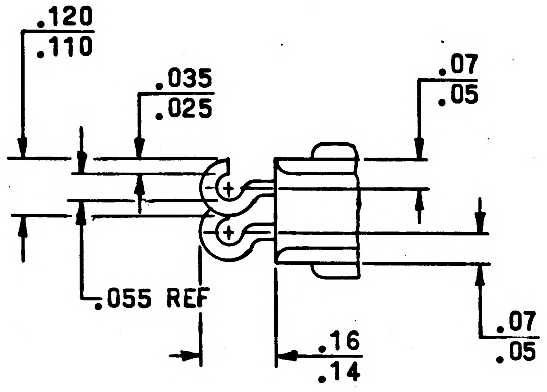
REVISIONS TDRR 21078

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

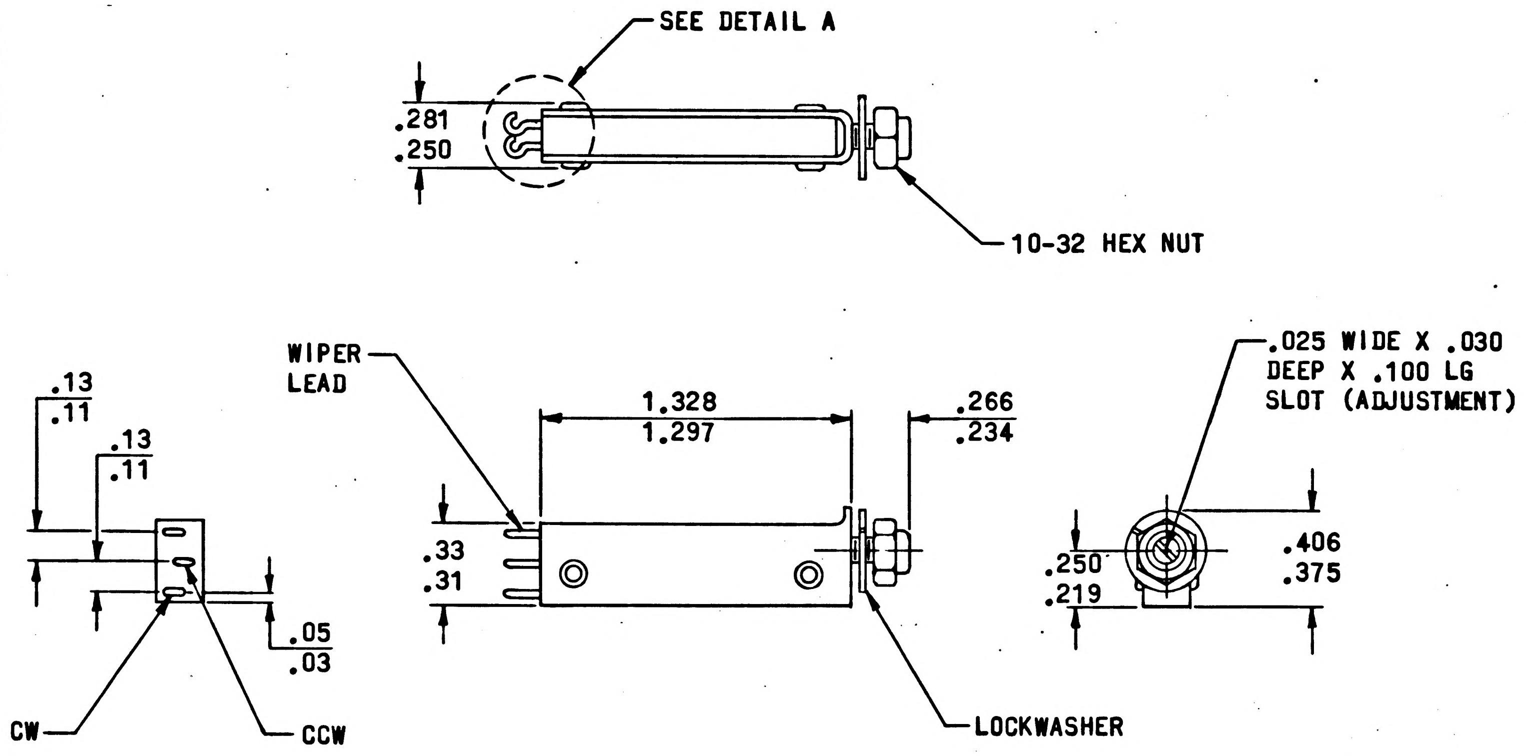
TABLE I
(SOLDER LUG CONFIGURATION FIGURE 1)

NASA DASH NUMBER	RESISTANCE (OHMS) ±5%	NOMINAL RESOLUTION (PERCENT)	MANUFACTURER'S PART NUMBER (FOR REFERENCE ONLY)
-001	10	2.0	224S-1-100M
-002	20	1.7	224S-1-200M
-003	50	1.2	224S-1-500M
-004	100	1.0	224S-1-101M
-005	200	0.8	224S-1-201M
-006	500	0.7	224S-1-501M
-007	1000	0.5	224S-1-102M
-008	2000	0.4	224S-1-202M
-009	5000	0.35	224S-1-502M
-010	10,000	0.25	224S-1-103M
-011	20,000	0.20	224S-1-203M
-012	25,000	0.20	224S-1-253M
-013	50,000	0.17	224S-1-503M
-014	100,000	0.17	224S-1-104M

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.


.120
.110
.035
.025
.07
.05
.055 REF
.16
.14
.07
.05

DETAIL A


SEE DETAIL A
.281
.250
10-32 HEX NUT
WIPER LEAD
.13
.11
.13
.11
.05
.03
CW
CCW
1.328
1.297
.266
.234
.33
.31
LOCKWASHER
.025 WIDE X .030 DEEP X .100 LG SLOT (ADJUSTMENT)
.250
.219
.406
.375

SOLDER LUG CONFIGURATION FIGURE I (TABLE I)

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ −	±.005 ±.02	+ −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN Yamasaki DATE 25 MAY 65
CHECKED Ed Foster 28 MAY 65
APPROVAL J. Ulber 28 May 65
APPROVAL J M Watson 7-15-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

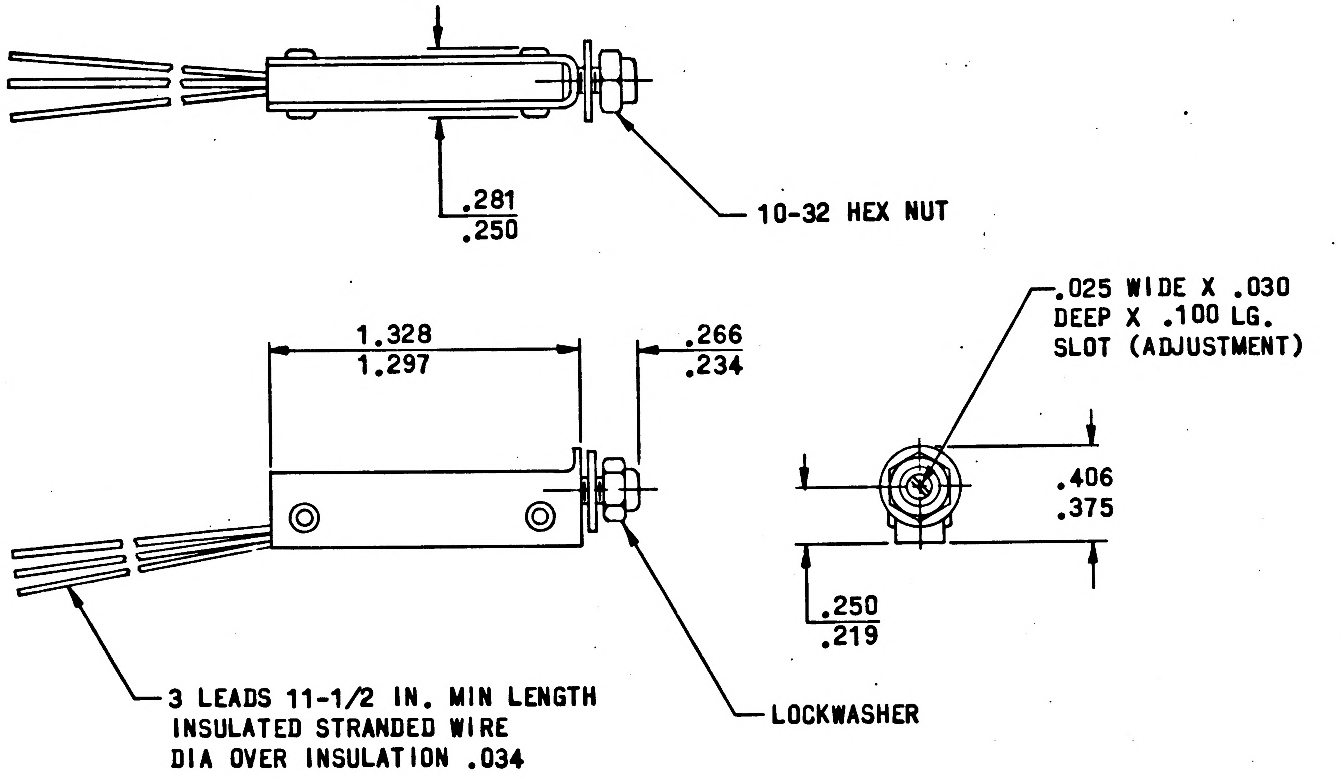
RESISTOR, VARIABLE
WIREWOUND, 1 WATT
(PANEL MOUNT)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897260
SCALE
SHEET 2 OF 3

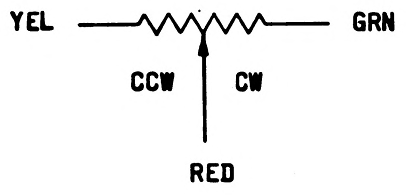
REVISIONS TDRR 21078					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

TABLE II
(WIRE LEAD CONFIGURATION FIGURE II)

NASA DASH NUMBER	RESISTANCE (OHMS) ±5%	NOMINAL RESOLUTION (PERCENT)	MANUFACTURER'S PART NUMBER (FOR REFERENCE ONLY)
-015	10	2.0	224L-1-100M
-016	20	1.7	224L-1-200M
-017	50	1.2	224L-1-500M
-018	100	1.0	224L-1-101M
-019	200	0.8	224L-1-201M
-020	500	0.7	224L-1-501M
-021	1000	0.5	224L-1-102M
-022	2000	0.4	224L-1-202M
-023	5000	0.35	224L-1-502M
-024	10,000	0.25	224L-1-103M
-025	20,000	0.20	224L-1-203M
-026	25,000	0.20	224L-1-253M
-027	50,000	0.17	224L-1-503M
-028	100,000	0.17	224L-1-104M


.281
.250
10-32 HEX NUT
1.328
1.297
.266
.234
.025 WIDE X .030 DEEP X .100 LG. SLOT (ADJUSTMENT)
.406
.375
.250
.219
3 LEADS 11-1/2 IN. MIN LENGTH INSULATED STRANDED WIRE DIA OVER INSULATION .034
LOCKWASHER

WIRE LEAD CONFIGURATION FIGURE II (TABLE II)


YEL
GRN
CCW
CW
RED

GRAPHICAL SYMBOL

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
±	± .005	±
	± .02	

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN
DRAWN M. Ganowski DATE 25 MAY 65
CHECKED Ed Foster 28 MAY 65
APPROVAL J. Urban 28 May 65
APPROVAL J. M. Watson 7-15-65
NASA APPROVAL 7/21/65
MIT APPROVAL 21 Jul 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE
WIREWOUND, 1 WATT
(PANEL MOUNT)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897260
SCALE		SHEET 3 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 206168		20 OCT 65	LK.
B		INITIAL RELEASE CLASS A PER TDRR 24042		20 OCT 65	CW

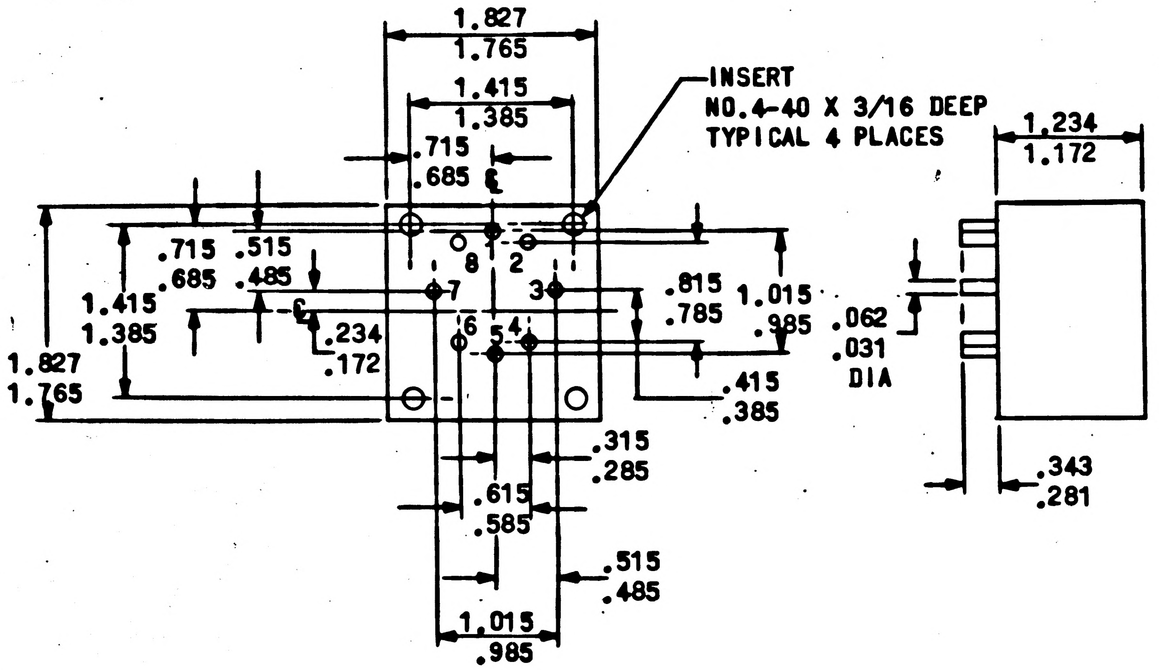
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN SPECIFICATION MIL-Q-9858.
   - C. CONTROL DATA PART NUMBER 4-14516 (FOR REF)

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL:
     - (1) MINIMUM MARKING: MARK PERMANENTLY AND LEGIBLY WITH THE NASA DRAWING NUMBER, MANUFACTURER'S NAME AND/OR SYMBOL, SERIAL NUMBER AND TERMINAL IDENTIFICATION. MANUFACTURER'S PART NUMBER MAY APPEAR ON PART AND PACKAGE.
   - B. ELECTRICAL:
     - (1) SET POINT: SHALL BE AS DEFINED BY PROCEDURE I USING CIRCUIT OF FIGURE I.
     - (2) ZENER VOLTAGE: SHALL BE AS DEFINED BY PROCEDURE I USING CIRCUIT OF FIGURE I.

3. DESIGN:
   - A. OPERATING VOLTAGE: 28^{+4}_{-6} VDC
   - B. INPUT RESISTANCE: 100 OHMS ±10%
   - C. OUTPUT LOAD: 50 MA MAXIMUM
   - D. THE UNIT SHALL BE CAPABLE OF MEETING ALL THE REQUIREMENTS LISTED UNDER ELECTRICAL INSPECTION WHEN SUBJECTED TO THE FOLLOWING ENVIRONMENTS OF SPECIFICATION MIL-E-5272.

ENVIRONMENT	REFERENCE PARAGRAPH
HIGH TEMPERATURE +65°C	4.1.2
LOW TEMPERATURE 0°C	4.2.1
HUMIDITY	4.4.1
ALTITUDE, CONDITION C. (50,000 FT)	4.5.6
VIBRATION 10 G'S, 5 TO 2000 CPS	4.7.2
SHOCK 20 G'S	4.15.5



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST

NEXT ASSY / USED ON APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	DO NOT SCALE THIS DRAWING	DRAWN M. Gustan DATE 25 MAY 65 CHECKED J. Stilma 27 MAY 65 APPROVAL D. Blondin 28 MAY 65 APPROVAL L. Geldman 10/20/65	COMPARATOR (28VDC, 50 MA) SPECIFICATION CONTROL DRAWING	
	MATERIAL	NASA APPROVAL A. C. METZGER	CODE IDENT NO. 99974	SIZE C 1897261
	CONTRACT NAS9-497	MIT APPROVAL 16 Nov 65	SCALE NONE	SHEET 1 of 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		THIS SHT ADDED PER MXC 206168		20 OCT 65	L.R.
B		INITIAL RELEASE CLASS A PER TDRR 24042		20 OCT 65	WRB CW

PROCEDURE I:

A. WITH SUPPLY NO. 3 AT 32 VOLTS DC:

1. SET S_1 AT POSITION 2. SET S_2 AT POSITION 2. I_L AS MONITORED ON M_4 SHALL BE 50 MA MAX WITH R_1 ADJUSTED FOR 0 VOLTS ON M_3 AND WITH M_2 AT 32 VOLTS. ADJUST R_1 UNTIL M_3 READS +0.15 VOLTS. LOAD VOLTAGE (V_{7-8}) SHALL BE 1.25 VOLTS MAXIMUM. READJUST R_1 FOR -0.15 VOLTS ON M_3. LOAD VOLTAGE (V_{7-8}) SHALL BE 32 VOLTS MINIMUM. THEN; SET S_2 AT POSITION 1. VOLTAGE AT M_2 SHALL READ 6.5 ± 0.4 VOLTS DC.
2. SET S_1 AT POSITION 1. SET S_2 AT POSITION 2. I_L AS MONITORED ON M_4 SHALL BE 50 MA MAX WITH M_2 AT 32 VOLTS. ADJUST R_2 FOR 100 μA on M_1. ADJUST R_1 UNTIL M_3 READS +10.15 VOLTS. LOAD VOLTAGE (V_{7-8}) SHALL BE 1.25 VOLTS MAXIMUM. ADJUST R_1 FOR +9.85 VOLTS ON M_3. THEN LOAD VOLTAGE (V_{7-8}) SHALL BE 32 VOLTS MINIMUM.
3. SET S_1 AT POSITION 3. SET S_2 AT POSITION 2. I_L AS MONITORED ON M_4 SHALL BE 50 MA MAX WITH M_2 AT 32 VOLTS. ADJUST R_2 FOR 100 μA ON M_1. ADJUST R_1 UNTIL M_3 READS -10.15 VOLTS. LOAD VOLTAGE (V_{7-8}) SHALL BE 1.25 VOLTS MAXIMUM. ADJUST R_1 FOR -9.85 VOLTS ON M_3. THEN LOAD VOLTAGE (V_{7-8}) SHALL BE 32 VOLTS MINIMUM.
4. INPUT RIPPLE: WITH THE SCOPE ACROSS TERMINALS (1-4), SET S_2 AT POSITION 3. ADJUST POWER SUPPLY NO. 3 FOR 28 VOLTS ON M_2. SET S_1 AT POSITION 2. ADJUST R_1 FOR 10 VOLTS ON M_3. THEN, RIPPLE VOLTAGE (1-4) OBSERVED ON THE SCOPE, SHALL BE 25 MILLIVOLTS (P-P) MAX.

B. WITH SUPPLY NO. 3 AT 22 VOLTS DC:

1. REPEAT STEPS A.1, A.2, AND A.3, EXCEPT WHEREVER M_2 PREVIOUSLY READ 32 VOLTS MINIMUM IT SHALL NOW READ 22 VOLTS MINIMUM.

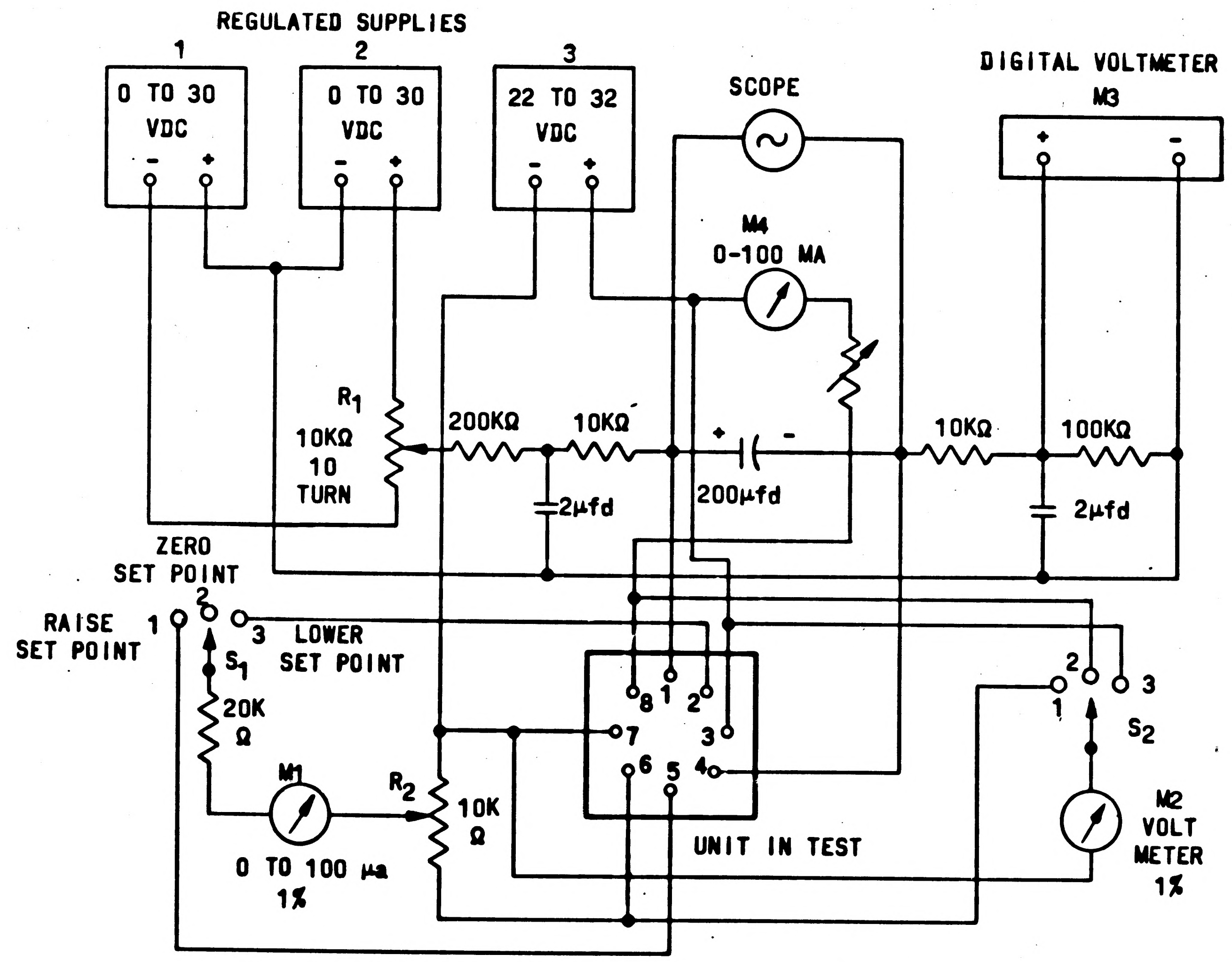

REGULATED SUPPLIES
1
0 TO 30 VDC
2
0 TO 30 VDC
3
22 TO 32 VDC
- +
SCOPE
DIGITAL VOLTMETER
M3
+ -
M4
0-100 MA
R1
10KΩ
10 TURN
200KΩ
10KΩ
2μfd
+ -
200μfd
10KΩ
100KΩ
2μfd
ZERO SET POINT
RAISE SET POINT
LOWER SET POINT
1 2 3
S1
20K Ω
M1
0 TO 100 μa 1%
R2
10K Ω
8 1 2 7 3 6 5 4
UNIT IN TEST
S2
M2
VOLT METER 1%

FIGURE I. TEST CIRCUIT (A1) THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − DECIMALS + — − ANGLES + — −
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Ozgol DATE 11 Oct 65
CHECKED Ed Foster 13 OCT 65
APPROVAL D. B. Jordin 13 OCT 65
APPROVAL V. Jaliman 10/26/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COMPARATOR, SIGNAL—
28 VDC, 50 MA

CODE IDENT NO. 99974
SIZE C
1897261
SCALE —
SHEET 2 of 2

REVISIONS 23419

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23419		19 OCT 65	JE cw

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. DESIGNED FOR USE WITH 1897267.
2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE, OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)
   - B. CONTACT WITHDRAWAL FORCE: 2 TO 16 OUNCES, MAX, USING APPROPRIATE TEST BLADE PER MIL-C-21097.
3. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL: .0126 PHOSPHOR BRONZE PER QQ-B-750.
     - (2) FINISH: .00003, MIN, GOLD OVER NICKEL STRIKE PER MIL-G-45204, CLASS II.
     - (3) CORROSION RESISTANCE: ALL METAL PARTS SHALL WITHSTAND 50 HOURS OF SALT SPRAY, PER MIL-STD-202 METHOD 101, TEST CONDITION B, WITHOUT EXTENSIVE CORROSION OF THE BASE METAL AND THE SPECIFIED CONTACT RESISTANCE SHALL NOT BE EXCEEDED.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CURRENT RATING: 5 AMPERES
     - (2) CONTACT RESISTANCE: MAXIMUM DROP OF 40 MILLIVOLTS AT RATED CURRENT WHEN INSTALLED IN 1897267 AND MATED WITH 1016376.

NASA DASH NUMBER	A	B	C	D	WIRE RANGE	INS. RANGE
-001	.125 .110	.121 .106	.095 .080	.090 .075	24 - 20 AWG	.040 -.080 DIA
-002	.105 .090	.100 .085	.080 .065	.070 .055	28 - 24 AWG	.030 -.060 DIA
-003	.130 .115	.135 .120	.080 .065	.070 .055	28 - 24 AWG	.078 SPECIAL
-004	-	-	-	-	2-22 OR 2-20	.045 -.072 DIA

NOTES:

1. SPECIAL TOOLING REQUIRED FOR CRIMPING, INSERTION AND REMOVAL OF CONTACTS.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

40

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN ART. NIKURS DATE 27 MAY 65
CHECKED Ed Foster 2 JUN 65
APPROVAL R. Trummer 2 June 65
APPROVAL L Goldman 9/19/65
NASA APPROVAL
MIT APPROVAL W Kupfer 21 Oct 65

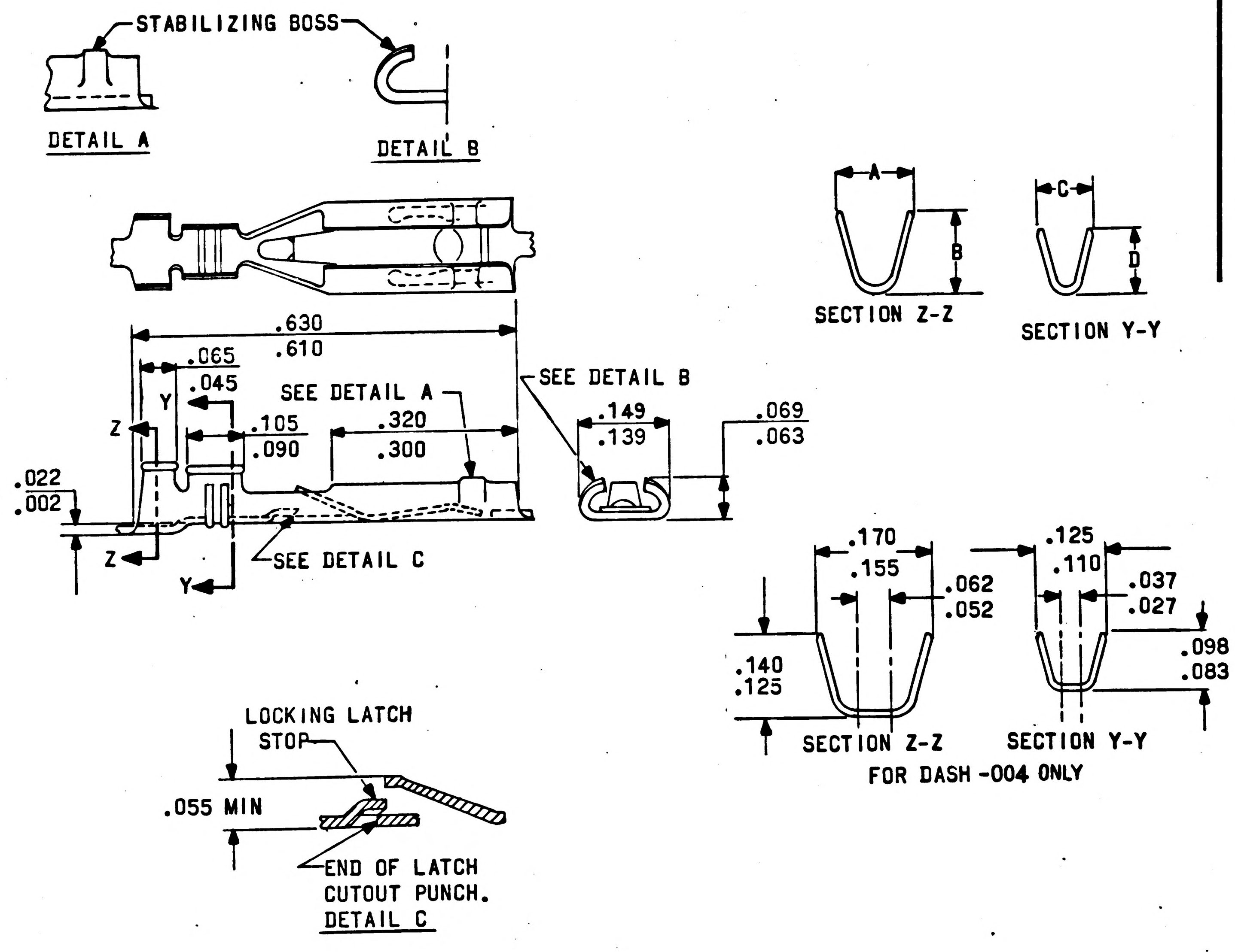
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, RECEPTACLE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897266
SCALE NONE
SHEET 1 OF 2

REVISIONS 23919					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23919		19 OCT 65	


STABILIZING BOSS
DETAIL A
DETAIL B
.630
.610
.065
.045
Y
Z
SEE DETAIL A
.105
.090
.320
.300
SEE DETAIL B
.149
.139
.069
.063
.022
.002
Z
Y
SEE DETAIL C
A
B
SECTION Z-Z
C
D
SECTION Y-Y
.170
.155
.062
.052
.140
.125
SECTION Z-Z
.125
.110
.037
.027
.098
.083
SECTION Y-Y
FOR DASH -004 ONLY
LOCKING LATCH STOP
.055 MIN
END OF LATCH CUTOUT PUNCH.
DETAIL C

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Art. Nikurs DATE 27 MAY 65
CHECKED Ed Foster 2 JUN 65
APPROVAL R. Trummer 2 June 65
APPROVAL [illegible] 11/9/65
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, RECEPTACLE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897266

SCALE NONE SHEET 2 OF 2

MIL 1077C-P

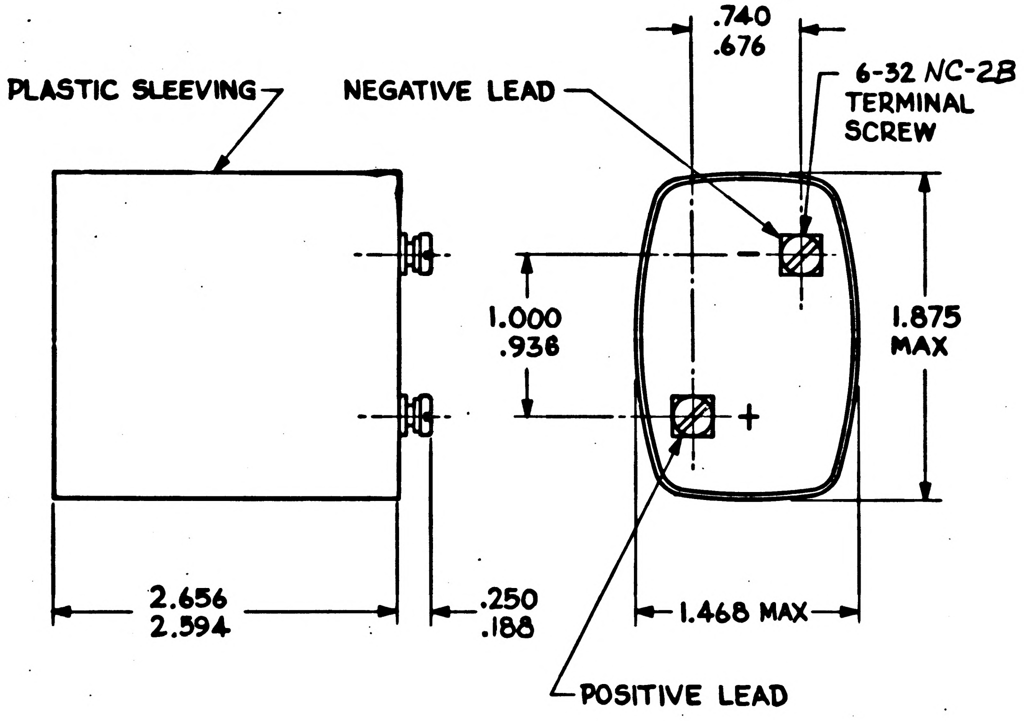
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 206169		10 OCT 65	R.H.T. EF
B		INITIAL RELEASE CLASS A PER TDR 24042		19 OCT 65	JR

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE FOLLOWING:
     - (1) NASA PART NUMBER
     - (2) MANUFACTURER'S NAME OR SYMBOL
     - (3) POLARITY OF TERMINALS (+ & -)
     - (4) DATE OF MANUFACTURE
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) BATTERIES SHALL BE SHIPPED IN A FULLY DISCHARGED STATE.

3. DESIGN:
   - A. OPEN CIRCUIT VOLTAGE: 4.0 VOLTS MINIMUM
   - B. OPERATING VOLTAGE: 2.9 VOLTS MINIMUM WHEN DRAWING 2.0 AMPERES
   - C. SHELF LIFE: 15 MONTHS MINIMUM (FULLY DISCHARGED)



NASA DASH NUMBER	MANUFACTURER'S PART NUMBER (REF)
-001	BD 3/2

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Sullivan DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL Bergenthal 10 June 65
APPROVAL 10/20/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY, STORAGE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897268
SCALE NONE
SHEET 1 of 1

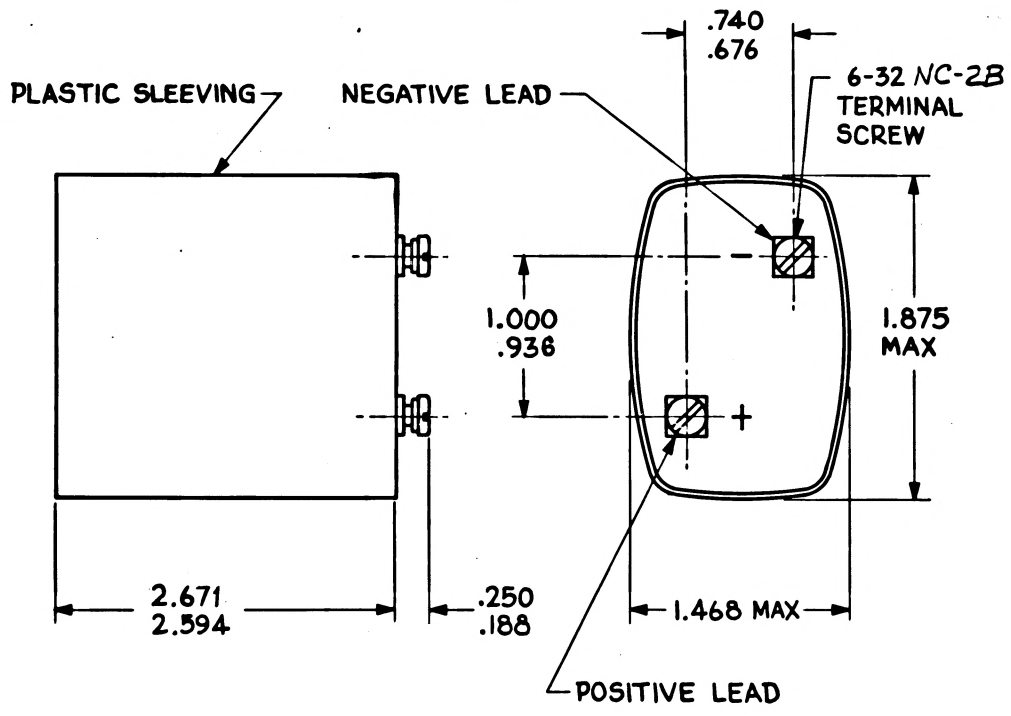
MIL 1077C-P

E.F.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 206169		10 OCT 65	R.W.T. EF
B		INITIAL RELEASE CLASS A PER TDRR 24042		19 OCT 65	JR
C		REVISD PER TDRR 24741		21 DEC 65	JWP

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858
2. INSPECTION AND ACCEPTANCE:
   - A. MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE FOLLOWING:
     - (1) NASA PART NUMBER
     - (2) MANUFACTURER'S NAME OR SYMBOL
     - (3) POLARITY OF TERMINALS (+ & -)
     - (4) DATE OF MANUFACTURE
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) BATTERIES SHALL BE SHIPPED IN A FULLY DISCHARGED STATE.
3. DESIGN:
   - A. OPEN CIRCUIT VOLTAGE: 4.0 VOLTS MINIMUM
   - B. OPERATING VOLTAGE: 2.9 VOLTS MINIMUM WHEN DRAWING 2.0 AMPERES
   - C. SHELF LIFE: 15 MONTHS MINIMUM (FULLY DISCHARGED)



NASA DASH NUMBER	MANUFACTURER'S PART NUMBER (REF)
-001	BD 3/2

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Sullivan DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL Bergenthal 10 June 65
APPROVAL 10/20/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY, STORAGE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897268
SCALE NONE
SHEET 1 of 1

MIL 1077C—P

REVISIONS 23387					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23387		8 SEP 65	OKD

REQUIREMENTS:

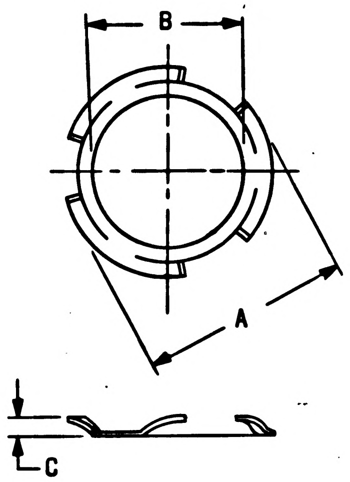
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL: SPRING STEEL PER MIL-S-17919, MATERIAL NUMBER 4.
   - B. FINISH: CADMIUM PEEN PLATED (.0002 MINIMUM THICKNESS).
   - C. MARKING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION PER MIL-STD-129:
     - SUPPLIER'S NAME
     - NASA PART NUMBER

3. DESIGN:
   - A. TIPS OF FINGERS MUST BE FLATTENED SLIGHTLY AND BE KEPT FREE OF BURRS.

NASA DASH NUMBER	A DIA MAX	B DIA MAX	C		DESIGN DATA FOR REFERENCE	MANUFACTURER'S PART NUMBER (FOR REFERENCE)
			MAX	MIN	LOAD IN POUNDS DEFLECTION TO 1/16	
-001	.595	.312	.109	.078	0.3 TO 1.0	S-04 (CAD. PEEN PLATE)
-002	.846	.453	.141	.109	3 TO 7	S-102
-003	.846	.453			9 TO 13	S-102-A
-004	.728	.344			4 TO 8	S-05
-005	.926	.453			6 TO 10	S-08
-006	.926	.344			22 TO 28	S-08-A
-007	1.004	.516			8 TO 12	S-09
-008	1.004	.516			5 TO 9	S-09-A
-009	1.164	.688			9 TO 13	S-10
-010	1.164	.688			60 TO 75	S-10-A
-011	1.164	.406			15 TO 21	S-10-B
-012	1.240	.688			10 TO 14	S-12
-013	1.240	.563			15 TO 21	S-12-A
-014	1.240	.688			15 TO 21	S-12-B
-015	1.360	.814			11 TO 15	S-15
-016	1.360	.814			17 TO 25	S-15-A
-017	1.555	.971			15 TO 21	S-17
-018	1.555	1.000			31 TO 39	S-17-A
-019	1.830	1.189			17 TO 23	S-20
-020	2.022	1.359	↓	↓	17 TO 23	S-25

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + _ − DECIMALS + _ − ANGLES + _ −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN M. Gruber DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL 10 JUN 65
APPROVAL 9-17-65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

WASHER, SPRING TENSION - FINGER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897269
SCALE NONE
SHEET 1 OF 1

MIL 1077C—P

REVISIONS 23387					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23387		8-SEP-65	OKD 76
B		REVISED PER TDRR-26097		22-FEB-66	B. JAC

Ⓜ

REQUIREMENTS:

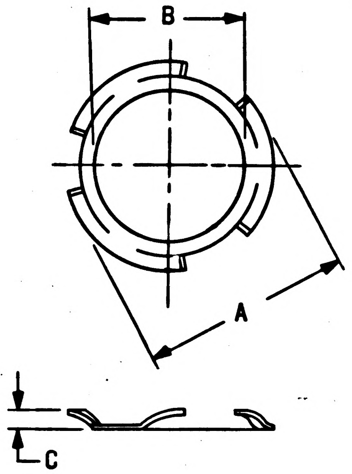
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL: SPRING STEEL PER MIL-S-17919, MATERIAL NUMBER 4.
   - B. FINISH: CADMIUM PEEN PLATED (.0002 MINIMUM THICKNESS).
   - C. MARKING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION PER MIL-STD-129:
     - SUPPLIER'S NAME
     - NASA PART NUMBER

3. DESIGN:
   - A. TIPS OF FINGERS MUST BE FLATTENED SLIGHTLY AND BE KEPT FREE OF BURRS.

NASA DASH NUMBER	A DIA NOM	B DIA NOM	C MAX	C MIN	DESIGN DATA FOR REFERENCE LOAD IN POUNDS DEFLECTION TO 1/16	MANUFACTURER'S PART NUMBER (FOR REFERENCE)	
-001	.595	.312	.109	.078	0.3 TO 1.0	S-04	(CAD. PEEN PLATE)
-002	.846	.453	.141	.109	3 TO 7	S-102	
-003	.846	.453			9 TO 13	S-102-A	
-004	.728	.344			4 TO 8	S-05	
-005	.926	.453			6 TO 10	S-08	
-006	.926	.344			22 TO 28	S-08-A	
-007	1.004	.516			8 TO 12	S-09	
-008	1.004	.516			5 TO 9	S-09-A	
-009	1.164	.688			9 TO 13	S-10	
-010	1.164	.688			60 TO 75	S-10-A	
-011	1.164	.406			15 TO 21	S-10-B	
-012	1.240	.688			10 TO 14	S-12	
-013	1.240	.563			15 TO 21	S-12-A	
-014	1.240	.688			15 TO 21	S-12-B	
-015	1.360	.814			11 TO 15	S-15	
-016	1.360	.814			17 TO 25	S-15-A	
-017	1.555	.971			15 TO 21	S-17	
-018	1.555	1.000			31 TO 39	S-17-A	
-019	1.830	1.189			17 TO 23	S-20	
-020	2.022	1.359	↓	↓	17 TO 23	S-25	↓

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —   DECIMALS ±.015   ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN M. Gruber DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL 10 JUN 65
APPROVAL 9-17-65
NASA APPROVAL
MIT APPROVAL 9/26 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

WASHER, SPRING TENSION - FINGER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974   SIZE C   1897269
SCALE NONE   SHEET 1 OF 1

MIL 1077C—P

REVISIONS 21959					
SYM	ZONE	DESCRIPTION		DATE	APPD.
A		REVISED PER TDRR 23779	CHG NO.	12 NOV 65	LK EF

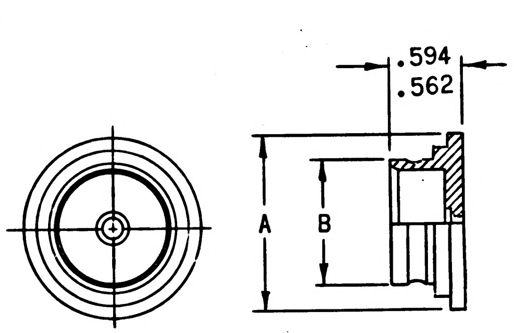
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS :
     - (1) MARKING:
       - (a) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
       - (b) PACKAGE: PACKAGE(S) SHALL BE MARKED PER MIL-STD-129.
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.
3. DESIGN:
   - A. MATERIAL: ALUMINUM - CADMIUM PLATED.
   - B. TO BE USED ON MANUFACTURER'S DM AND DS SERIES PLUGS.

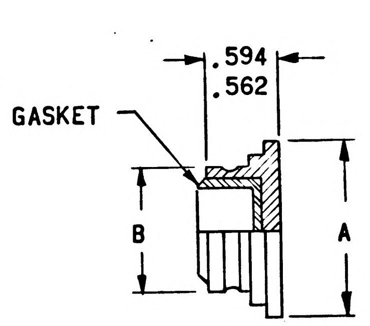
DASH NUMBER	CLASS	SHELL SIZE	A	B	MANUFACTURER'S PART NUMBER (REF)
-004	A	3	.734 .703	.440 .430	DM 97-3A
-005	A	7	.890 .860	.575 .565	DM 97-7A
-003	A	12	1.078 1.047	.709 .699	DM 97-12A
-002	A	19	1.203 1.172	.848 .838	DM 97-19A
-001	A	27	1.359 1.328	1.005 .995	DM 97-27A
-006	A	37	1.515 1.485	1.125 1.115	DM 97-37A
-101	B	3	.734 .703	.440 .430	DM 97-3B
-102	B	7	.890 .860	.575 .565	DM 97-7B
-103	B	12	1.078 1.047	.709 .699	DM 97-12B
-104	B	19	1.203 1.172	.848 .838	DM 97-19B
-105	B	27	1.359 1.328	1.005 .995	DM 97-27B
-106	B	37	1.515 1.485	1.125 1.115	DM 97-37B

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.



CLASS A
(SOCKET CONTACT PLUGS)



CLASS B
(PIN CONTACT PLUG)

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + __ − DECIMALS + __ − ANGLES + __ −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN 8 Agne DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL J.V. WEAN 11 JUN 65
APPROVAL L Gedimon 7/26/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COVER, ELECTRICAL CONNECTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897276
SCALE NONE SHEET 1 OF 1

MIL 1077C—F

REVISIONS 21989

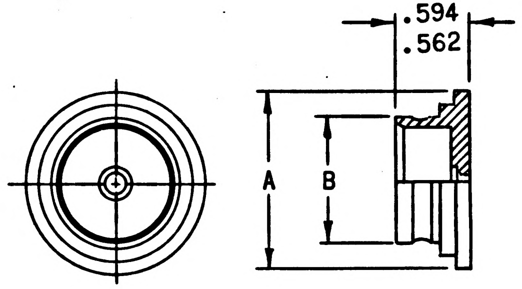
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING:
       - (a) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
       - (b) PACKAGE: PACKAGE(S) SHALL BE MARKED PER MIL-STD-129.
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.
3. DESIGN:
   - A. MATERIAL: ALUMINUM - CADMIUM PLATED.
   - B. TO BE USED ON CONNECTORS 1010771-201 (-001) AND 1010771-207 (-002).

NASA DASH NUMBER	A	B
-001	1.359 1.328	1.005 .995
-002	1.203 1.172	.848 .838

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



MASTER

PROCURE ONLY FROM APPROVED SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S Agne DATE 9 JUN 65
CHECKED Ed Foster 10 JUN 65
APPROVAL J.V. WEAN 11 JUN 65
APPROVAL L Jedinan 7/26/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COVER, ELECTRICAL CONNECTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897276
SCALE NONE
SHEET 1 OF 1

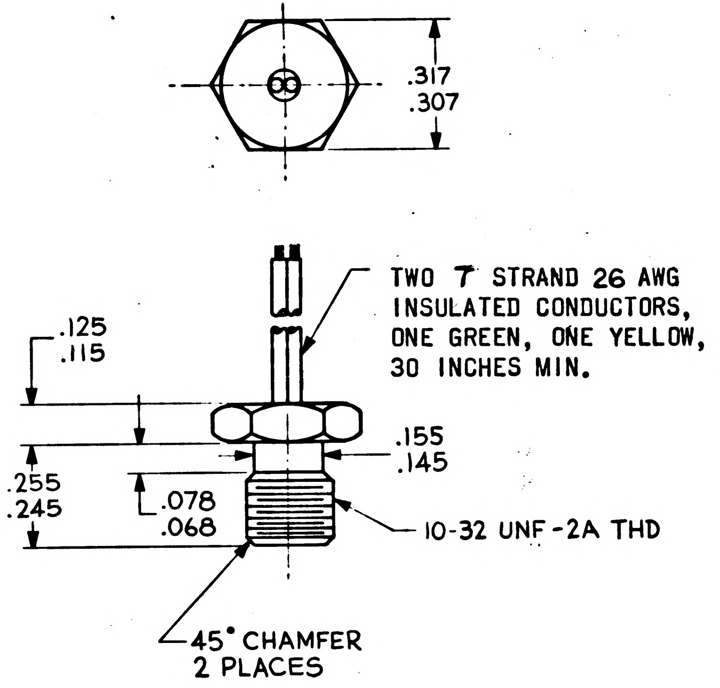
REVISIONS 23378					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 204813		10 SEP 65	B. TATICEK EF
B		REVISED PER MXC 205465		12 OCT 65	JW EF
C		INITIAL RELEASE CLASS A PER TDRR 23378		18 OCT 65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. INSPECTION AND ACCEPTANCE:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) RESISTANCE: 3000 OHMS ± 50 OHMS AT 25°C ±.2°C.
   - B. MECHANICAL REQUIREMENTS:
     - (1) MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME OR SYMBOL AND THE NASA PART NUMBER.
     - (2) MATERIAL: SCREW SHALL BE MADE OF CORROSION RESISTANT STEEL.

3. DESIGN:
   - A. THERMISTOR SHALL BE COMPLETELY EMBEDDED WITHIN THREADED PORTION OF SCREW.
   - B. TIME CONSTANT (INCLOSED THERMISTOR ONLY)
     - (1) 1 SECOND MAXIMUM SUSPENDED BY LEADS IN WELL STIRRED OIL BATH
     - (2) 10 SECOND MAXIMUM SUSPENDED BY LEAD IN STILL AIR
   - C. DISSIPATION CONSTANT (INCLOSED THERMISTOR ONLY)
     - (1) 8 MW/°C ± .5 MW/°C SUSPENDED BY LEADS IN WELL STIRRED OIL BATH
     - (2) 1 MW/°C ± .5 MW/°C SUSPENDED BY LEADS IN STILL AIR
   - D. MAXIMUM OPERATING TEMPERATURE: +150°C (INCLOSED THERMISTOR ONLY)
   - E. RESISTANCE AND TOLERANCE: PER TABLE I, II, AND III (INCLOSED THERMISTOR ONLY)
   - F. INSULATION RESISTANCE: 50 MEGOHMS MIN BETWEEN THERMISTOR AND SCREW.


.317
.307
TWO 7 STRAND 26 AWG INSULATED CONDUCTORS, ONE GREEN, ONE YELLOW, 30 INCHES MIN.
.125
.115
.155
.145
.255
.245
.078
.068
10-32 UNF-2A THD
45° CHAMFER 2 PLACES

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Sullivan DATE 17 JUN 65
CHECKED 18 JUN 65
APPROVAL 6-21-65
APPROVAL J. M. Watson 10-13-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, THERMAL—PROBE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897283
SCALE NONE
SHEET 1 of 2

REVISIONS 23328					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISION STATUS CHANGE		10 SEP 65	R. Tatice EF
B		REVISION STATUS CHANGED		12 OCT 65	JW EF
C		INITIAL RELEASE CLASS A PER TDRR 23378		18 OCT 65	

D

C

B

A

TABLE I

RESISTANCE VERSUS TEMPERATURE -80°C TO +150°C

TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.
-80	2211K	-44	132.2K	-8	14.90K	28	2633	64	647.1	100	203.8	136	77.6
79	2022K	43	123.5K	7	14.12K	29	2523	65	624.7	101	197.9	137	75.8
78	1851K	42	115.4K	6	13.39K	30	2417	66	603.3	102	192.2	138	73.9
77	1696K	41	107.9K	5	12.70K	31	2317	67	582.6	103	186.8	139	72.2
76	1555K	40	101.0K	4	12.05K	32	2221	68	562.8	104	181.5	140	70.4
75	1426K	39	94.48K	3	11.44K	33	2130	69	543.7	105	176.4	141	68.8
74	1309K	38	88.46K	2	10.86K	34	2042	70	525.4	106	171.4	142	67.1
73	1202K	37	82.87K	-1	10.31K	35	1959	71	507.8	107	166.7	143	65.5
72	1105K	36	77.66K	0	9796	36	1880	72	490.9	108	162.0	144	64.0
71	1016K	35	72.81K	1	9310	37	1805	73	474.7	109	157.6	145	62.5
70	935.4K	34	68.30K	2	8851	38	1733	74	459.0	110	153.2	146	61.1
69	861.4K	33	64.09K	3	8417	39	1664	75	444.0	111	149.0	147	59.6
68	793.7K	32	60.17K	4	8006	40	1598	76	429.5	112	145.0	148	58.3
67	731.8K	31	56.51K	5	7618	41	1535	77	415.6	113	141.1	149	56.9
66	675.2K	30	53.10K	6	7252	42	1475	78	402.2	114	137.2	150	55.6
65	623.3K	29	49.91K	7	6905	43	1418	79	389.3	115	133.6		
64	575.7K	28	46.94K	8	6576	44	1363	80	376.9	116	130.0		
63	532.1K	27	44.16K	9	6265	45	1310	81	364.9	117	126.5		
62	492.1K	26	41.56K	10	5971	46	1260	82	353.4	118	123.2		
61	455.3K	25	39.13K	11	5692	47	1212	83	342.2	119	119.9		
60	421.5K	24	36.86K	12	5427	48	1167	84	331.5	120	116.8		
59	390.5K	23	34.73K	13	5177	49	1123	85	321.2	121	113.8		
58	361.9K	22	32.74K	14	4939	50	1081	86	311.3	122	110.8		
57	335.7K	21	30.87K	15	4714	51	1040	87	301.7	123	107.9		
56	311.5K	20	29.13K	16	4500	52	1002	88	292.4	124	105.2		
55	289.2K	19	27.49K	17	4297	53	965.0	89	283.5	125	102.5		
54	268.6K	18	25.95K	18	4105	54	929.6	90	274.9	126	99.9		
53	249.7K	17	24.51K	19	3922	55	895.8	91	266.6	127	97.3		
52	232.2K	16	23.16K	20	3748	56	863.3	92	258.6	128	94.9		
51	216.0K	15	21.89K	21	3583	57	832.2	93	250.9	129	92.5		
50	201.1K	14	20.70K	22	3426	58	802.3	94	243.4	130	90.2		
49	187.3K	13	19.58K	23	3277	59	773.7	95	236.2	131	87.9		
48	174.5K	12	18.52K	24	3135	60	746.3	96	229.3	132	85.7		
47	162.7K	11	17.53K	25	3000	61	719.9	97	222.6	133	83.6		
46	151.7K	10	16.60K	26	2872	62	694.7	98	216.1	134	81.6		
-45	141.6K	-9	15.72K	27	2750	63	670.4	99	209.8	135	79.6		

TABLE II

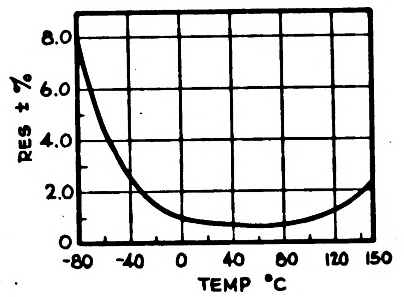
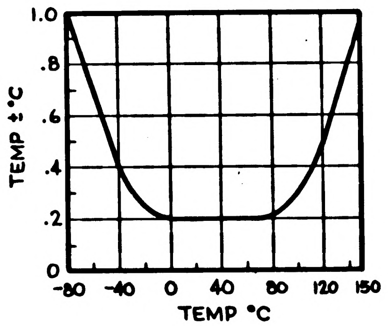


TABLE III



NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN J. Sullivan DATE 17 JUN 65
CHECKED D. L. Hoy 18 JUN 65
APPROVAL J. Urban 6-21-65
APPROVAL J. M. Watson 10-13-65

NASA APPROVAL

MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, THERMAL—BUTTON

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897283
SCALE —		SHEET 2 of 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
		REVISIONS 23387			
A		REVISED PER MXC-204814		9 SEP 65	RJU W.D
B		REVISED PER MXC 205466		5 OCT 65	J.H.P
C		INITIAL RELEASE CLASS A PER TDRR 23387		18 OCT 65	LLF

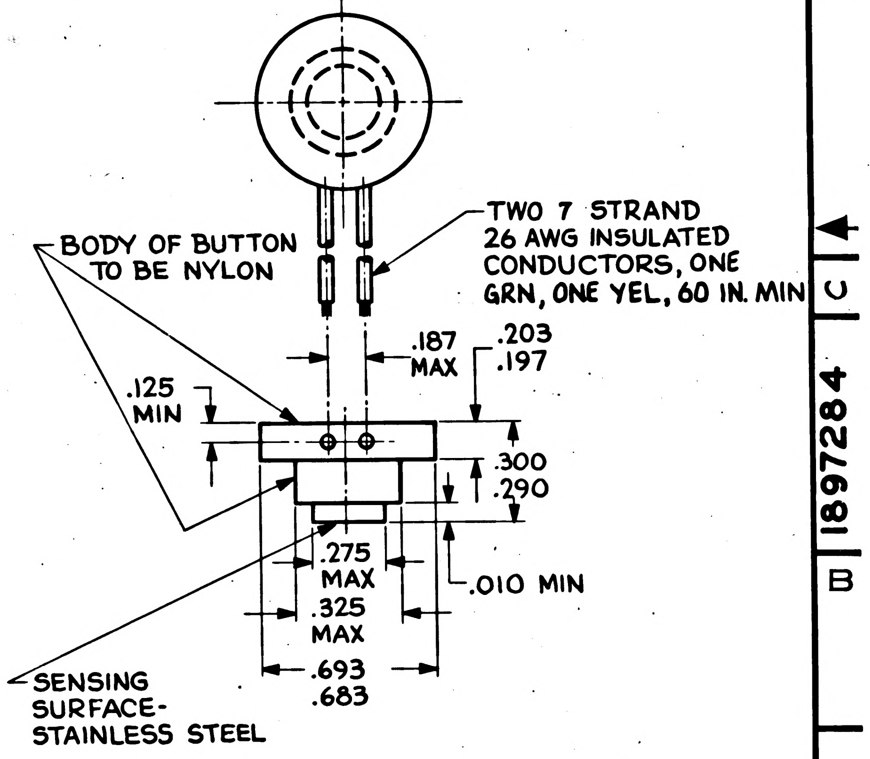
REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. INSPECTION AND ACCEPTANCE:
   A. ELECTRICAL REQUIREMENTS:
      (1) RESISTANCE: 3000 OHMS ±50 OHMS AT 25°C±.2°C.

   B. MECHANICAL REQUIREMENTS:
      (1) MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME OR SYMBOL AND THE NASA PART NUMBER.
      (2) 3K TO BE PERMANENTLY MARKED ON NYLON BODY.

3. DESIGN REQUIREMENTS:
   A. TIME CONSTANT (INCLOSED THERMISTOR ONLY)
      (1) ONE (1) SECOND MAXIMUM SUSPENDED BY LEADS IN WELL STIRRED OIL BATH
      (2) TEN (10) SECOND MAXIMUM SUSPENDED BY LEADS IN STILL AIR
   B. DISSIPATION CONSTANT (INCLOSED THERMISTOR ONLY)
      (1) 8 MW/°C ± .5 MW/°C SUSPENDED BY LEADS IN WELL STIRRED OIL BATH
      (2) 1 MW/°C ± .5 MW/°C SUSPENDED BY LEADS IN STILL AIR
   C. MAXIMUM OPERATING TEMPERATURE: +150°C (INCLOSED THERMISTOR ONLY)
   D. RESISTANCE AND TOLERANCE: PER TABLE I, II AND III (INCLOSED THERMISTOR ONLY)
   E. INSULATION RESISTANCE BETWEEN THERMISTOR AND SENSING SURFACE: 50 MEG OHMS MIN.


BODY OF BUTTON TO BE NYLON
TWO 7 STRAND 26 AWG INSULATED CONDUCTORS, ONE GRN, ONE YEL, 60 IN. MIN
.187 MAX
.203
.197
.125 MIN
.300
.290
.275 MAX
.010 MIN
.325 MAX
.693
.683
SENSING SURFACE-STAINLESS STEEL

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − | DECIMALS + — − | ANGLES + — −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Sullivan DATE 17 JUN 65
CHECKED D. Lof 18 JUN 65
APPROVAL J. Urban 6-21-65
APPROVAL 9-17-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, THERMAL—BUTTON

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897284
SCALE NONE
SHEET 1 of 2

1897284

MIL 1077C—P

REVISIONS 23387					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISION STATUS CHANGED		9 SEP 65	RJJ W.D.
B		REVISION STATUS CHANGED		5 OCT 65	J.H.P.
C		INITIAL RELEASE CLASS A PER TDRR 23387		18 OCT 65	LLF

TABLE I

RESISTANCE VERSUS TEMPERATURE -80°C TO +150°C

TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.	TEMP °C	RES.
-80	2211K	-44	132.2K	-8	14.90K	28	2633	64	647.1	100	203.8	136	77.6
79	2022K	43	123.5K	7	14.12K	29	2523	65	624.7	101	197.9	137	75.8
78	1851K	42	115.4K	6	13.39K	30	2417	66	603.3	102	192.2	138	73.9
77	1696K	41	107.9K	5	12.70K	31	2317	67	582.6	103	186.8	139	72.2
76	1555K	40	101.0K	4	12.05K	32	2221	68	562.8	104	181.5	140	70.4
75	1426K	39	94.48K	3	11.44K	33	2130	69	543.7	105	176.4	141	68.8
74	1309K	38	88.46K	2	10.86K	34	2042	70	525.4	106	171.4	142	67.1
73	1202K	37	82.87K	-1	10.31K	35	1959	71	507.8	107	166.7	143	65.5
72	1105K	36	77.66K	0	9796	36	1880	72	490.9	108	162.0	144	64.0
71	1016K	35	72.81K	1	9310	37	1805	73	474.7	109	157.6	145	62.5
70	935.4K	34	68.30K	2	8851	38	1733	74	459.0	110	153.2	146	61.1
69	861.4K	33	64.09K	3	8417	39	1664	75	444.0	111	149.0	147	59.6
68	793.7K	32	60.17K	4	8006	40	1598	76	429.5	112	145.0	148	58.3
67	731.8K	31	56.51K	5	7618	41	1535	77	415.6	113	141.1	149	56.9
66	675.2K	30	53.10K	6	7252	42	1475	78	402.2	114	137.2	150	55.6
65	623.3K	29	49.91K	7	6905	43	1418	79	389.3	115	133.6		
64	575.7K	28	46.94K	8	6576	44	1363	80	376.9	116	130.0		
63	532.1K	27	44.16K	9	6265	45	1310	81	364.9	117	126.5		
62	492.1K	26	41.56K	10	5971	46	1260	82	353.4	118	123.2		
61	455.3K	25	39.13K	11	5692	47	1212	83	342.2	119	119.9		
60	421.5K	24	36.86K	12	5427	48	1167	84	331.5	120	116.8		
59	390.5K	23	34.73K	13	5177	49	1123	85	321.2	121	113.8		
58	361.9K	22	32.74K	14	4939	50	1081	86	311.3	122	110.8		
57	335.7K	21	30.87K	15	4714	51	1040	87	301.7	123	107.9		
56	311.5K	20	29.13K	16	4500	52	1002	88	292.4	124	105.2		
55	289.2K	19	27.49K	17	4297	53	965.0	89	283.5	125	102.5		
54	268.6K	18	25.95K	18	4105	54	929.6	90	274.9	126	99.9		
53	249.7K	17	24.51K	19	3922	55	895.8	91	266.6	127	97.3		
52	232.2K	16	23.16K	20	3748	56	863.3	92	258.6	128	94.9		
51	216.0K	15	21.89K	21	3583	57	832.2	93	250.9	129	92.5		
50	201.1K	14	20.70K	22	3426	58	802.3	94	243.4	130	90.2		
49	187.3K	13	19.58K	23	3277	59	773.7	95	236.2	131	87.9		
48	174.5K	12	18.52K	24	3135	60	746.3	96	229.3	132	85.7		
47	162.7K	11	17.53K	25	3000	61	719.9	97	222.6	133	83.6		
46	151.7K	10	16.60K	26	2872	62	694.7	98	216.1	134	81.6		
-45	141.6K	-9	15.72K	27	2750	63	670.4	99	209.8	135	79.6		

TABLE II

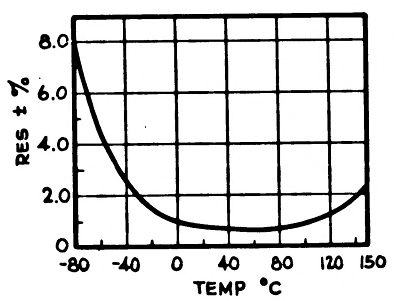
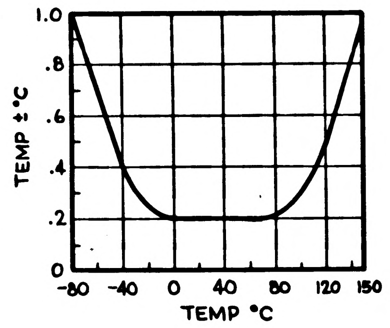


TABLE III



NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
− − −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN J Sullivan DATE 17 JUN 65
CHECKED 18 JUN 65
APPROVAL 6-21-65
APPROVAL 9-17-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, THERMAL—BUTTON

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897284
SCALE —		SHEET 2 of 2

MIL 1077C—P

REVISIONS		23392			
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 203361		27 JUL 65	RLP EF
B		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC FE

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482.

NASA DASH NUMBER	MANUFACTURER'S PART NUMBER (REF)
-001	22050-20-98S-311
-002	22050-20-98SW-311
-003	22050-20-98SX-311
-004	22050-20-98SY-311
-006	DTK00-24-31S-311
-007	DTK00-24-31SW-311
-008	DTK00-24-31SX-311
-009	DTK00-24-31SY-311

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Sullivan DATE 17 JUN 65
CHECKED D Fox 22 JUN 65
APPROVAL R Trummer 23 Jun 65
APPROVAL Gedeman
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL— SQUARE FLANGE, BAYONET LOCKING COUPLING, CRIMP TYPE SOCKET CONTACTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897288
SCALE NONE
SHEET 1 of 1

MIL 1077C—P

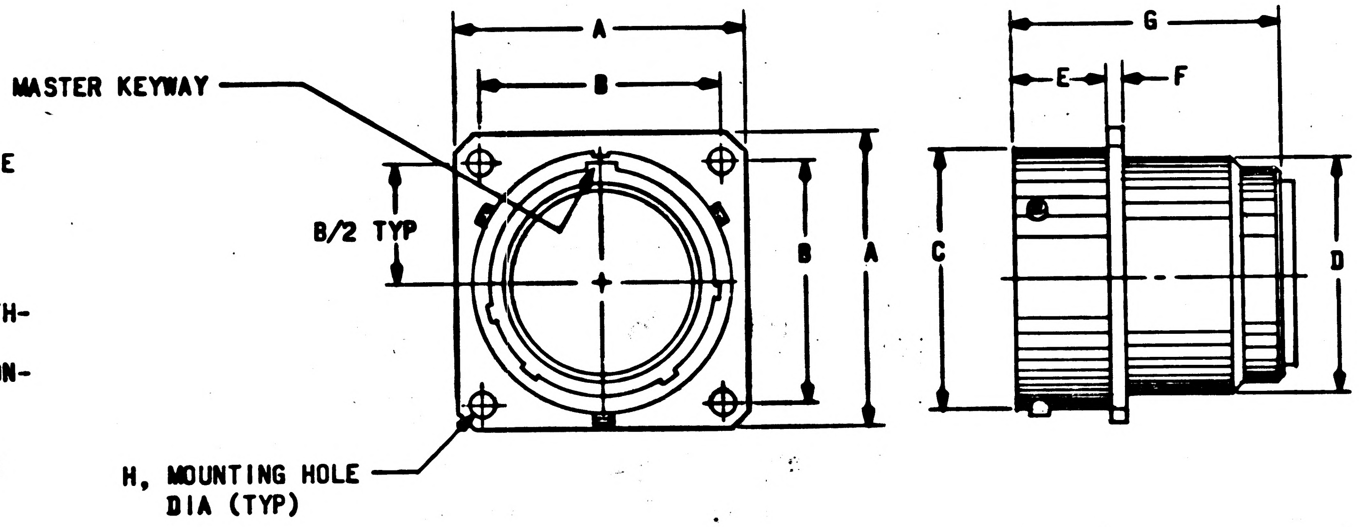
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	–	REPLACES REV B WITH CHANGE PER TDRR 25320	–	29 DEC 65	J J J

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482, EXCEPT THE SOLVENT EMERSION REQUIREMENT PER MIL-H-5606.
   - D. 12, MIN, CRIMP TYPE SOCKET CONTACTS PER 1897348 AND 2, MIN, SEALING PLUGS PER 1010958 TO BE SUPPLIED WITH EACH UNIT FOR DASH NUMBERS -001 THROUGH -004. 33, MIN, CRIMP TYPE SOCKET CONTACTS PER 1897347 AND 4, MIN, SEALING PLUGS PER 1010958 TO BE SUPPLIED WITH EACH UNIT FOR DASH NUMBERS -006 THROUGH -009.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)
   - B. CONTACT WITHDRAWAL FORCE: PER 1897347 OR 1897348, AS APPLICABLE.

3. DESIGN:
   - A. MECHANICAL:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY PER MIL-C-26482.
       - (b) CENTER INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT.
       - (c) FRONT INSERT AND REAR GROMMET: SILICONE RUBBER.
     - (2) FINISH: SHELL; CLEAR CADMIUM FINISH.
     - (3) COUPLING MECHANISM: BAYONET LOCKING COUPLING.
     - (4) CONTACT RETENTION: 25 LBS, MIN IN BOTH DIRECTIONS WITHOUT DISPLACEMENT.
     - (5) MAX ENGAGEMENT TORQUE ; MIN DISENGAGEMENT TORQUE (WITH CONTACTS): PER TABLE I.
   - B. ELECTRICAL:
     - (1) CONTACT CURRENT RATING: NO. 16 CONTACTS - 20 AMPERES; NO. 12 CONTACTS - 35 AMPERES.
     - (2) VOLTAGE RATING: 1500 VOLTS RMS AT SEA LEVEL.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Barbs DATE 15 JUN 65
CHECKED 10 Nov 65
APPROVAL R. Trummer 15 Nov 65
APPROVAL 21-11-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
SQUARE FLANGE, BAYONET LOCKING
COUPLING, CRIMP TYPE SOCKET CONTACTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897288
SCALE NONE
SHEET 1 of 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		THIS SHEET ADDED PER TDRR 25320	—	29 DEC 65	JJJ

REQUIREMENTS: (CONTINUED)

(3) WITHSTANDING VOLTAGE: 1500 V RMS AT SEA LEVEL.

(4) CONTACT RESISTANCE: (WHEN MEASURED FROM THE REAR OF THE PIN CONTACT CRIMP BARREL TO THE REAR OF THE SOCKET CONTACT CRIMP BARREL): NO. 16 CONTACTS - 22 MILLIVOLTS, MAX, AT 20 AMPERES; NO. 12 CONTACTS - 18 MILLIVOLTS, MAX, AT 35 AMPERES.

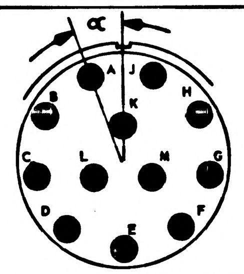
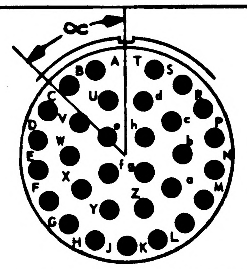
(5) OPERATING TEMPERATURE: +125°C, MAX.

(6) INSULATION RESISTANCE: 5000 MEGOHMS MIN, AT 25°C. 50 MEGOHMS, MIN, AT 125°C.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. INSERT SHOWN IN NORMAL POSITION. FOR ALTERNATE POSITIONS, THE INSERT IS ROTATED ∝ DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. FOR STRAIN RELIEF CLAMP SEE 1897315.
4. FOR SPARE CONTACTS SEE 1897347 OR 1897348, AS APPLICABLE; FOR SPARE SEALING PLUGS SEE 1010958.

TABLE I

NASA DASH NUMBER	NO. AND SIZE OF CONTACTS	∝ IN DEGREES	DIMENSIONS A MAX	B	C	D	E	F	G MAX	H	MAX ENG TORQUE (IN-LBS)	MIN DIS-ENG TORQUE (IN-LBS)	CONTACT ARRANGEMENT MATING FACE VIEW SEE NOTE	MANUFACTURER'S PART NUMBER (REF)
-001	12 NO.12	0	1.453	1.161 1.151	1.251 1.245	1.187 1.157	.587 .556	.109 .079	1.250	.125 .115	36	6		22050-20-98S-311
-002		20												22050-20-98SW-311
-003		70												22050-20-98SX-311
-004		169												22050-20-98SY-311
-006	31 NO.16	0	1.703	1.380 1.370	1.501 1.495	1.453 1.423	.620 .589	.109 .079	1.328	.152 .142	38	7		DTK00-24-31S-311
-007		46												DTK00-24-31SW-311
-008		74												DTK00-24-31SX-311
-009		122												DTK00-24-31SY-311

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Parks DATE 15 JUN 65
CHECKED 10 Nov 65
APPROVAL P. Trummer 15 Nov 65
APPROVAL 1-11-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL 14 Jan 66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
SQUARE FLANGE, BAYONET LOCKING
COUPLING, CRIMP TYPE SOCKET CONTACTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897288
SCALE NONE
SHEET 2 of 2

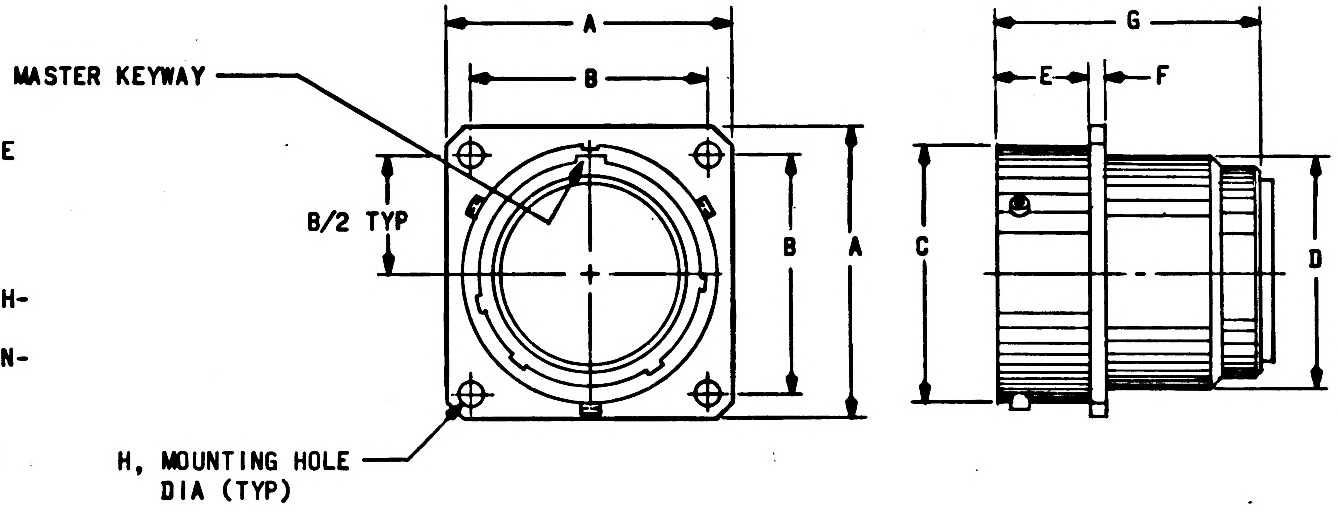
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		REPLACES REV B WITH CHANGE PER TDRR 25320	–	29 DEC 65	J J J
D		REVISED PER TDRR 28942		25 MAY 66	JIM P CP

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482, EXCEPT THE SOLVENT EMERSION REQUIREMENT PER MIL-H-5606.
   - D. 12, MIN, CRIMP TYPE SOCKET CONTACTS PER 1897348-008 AND 2, MIN, SEALING PLUGS PER 1897411-005 TO BE SUPPLIED WITH EACH UNIT FOR DASH NUMBERS -001 THROUGH -004. 33, MIN, CRIMP TYPE SOCKET CONTACTS PER 1897347 AND 4, MIN, SEALING PLUGS PER 1894711-003 TO BE SUPPLIED WITH EACH UNIT FOR DASH NUMBERS -006 THROUGH -009.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)
   - B. CONTACT WITHDRAWAL FORCE: PER 1897347 OR 1897348, AS APPLICABLE.

3. DESIGN:
   - A. MECHANICAL:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY PER MIL-C-26482.
       - (b) CENTER INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT.
       - (c) FRONT INSERT AND REAR GROMMET: SILICONE RUBBER.
     - (2) FINISH: SHELL; CLEAR CADMIUM FINISH.
     - (3) COUPLING MECHANISM: BAYONET LOCKING COUPLING.
     - (4) CONTACT RETENTION: 25 LBS, MIN IN BOTH DIRECTIONS WITHOUT DISPLACEMENT.
     - (5) MAX ENGAGEMENT TORQUE ; MIN DISENGAGEMENT TORQUE (WITH CONTACTS): PER TABLE I.
   - B. ELECTRICAL:
     - (1) CONTACT CURRENT RATING: NO. 16 CONTACTS - 20 AMPERES; NO. 12 CONTACTS - 35 AMPERES.
     - (2) VOLTAGE RATING: 1500 VOLTS RMS AT SEA LEVEL.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
–	–	–

DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Garbs DATE 15 JUN 65
CHECKED Malekowski 10 Nov 65
APPROVAL R. Trummer 15 Nov 65
APPROVAL 1-11-66
A. C. METZGER
NASA APPROVAL
MIT APPROVAL 18

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
SQUARE FLANGE, BAYONET LOCKING
COUPLING, CRIMP TYPE SOCKET CONTACTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897288
SCALE NONE
SHEET 1 of 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		THIS SHEET ADDED PER TDRR 25320	—	29 DEC 65	J J J
D		REVISED PER TDRR 28942		25 MAY 66	JIMP CP

REQUIREMENTS: (CONTINUED)

(3) WITHSTANDING VOLTAGE: 1500 V RMS AT SEA LEVEL.

(4) CONTACT RESISTANCE: (WHEN MEASURED FROM THE REAR OF THE PIN CONTACT CRIMP BARREL TO THE REAR OF THE SOCKET CONTACT CRIMP BARREL): NO. 16 CONTACTS - 22 MILLIVOLTS, MAX, AT 20 AMPERES; NO. 12 CONTACTS - 18 MILLIVOLTS, MAX, AT 35 AMPERES.

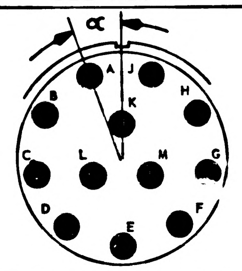
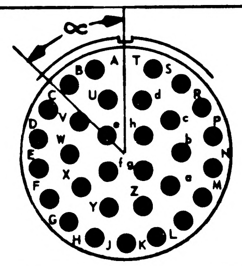
(5) OPERATING TEMPERATURE: +125°C, MAX.

(6) INSULATION RESISTANCE: 5000 MEGOHMS MIN, AT 25°C. 50 MEGOHMS, MIN, AT 125°C.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. INSERT SHOWN IN NORMAL POSITION. FOR ALTERNATE POSITIONS, THE INSERT IS ROTATED ∝ DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. FOR STRAIN RELIEF CLAMP SEE 1897315.
4. FOR SPARE CONTACTS SEE 1897347 OR 1897348, AS APPLICABLE; FOR SPARE SEALING PLUGS SEE 1897411.

TABLE I

NASA DASH NUMBER	NO. AND SIZE OF CONTACTS	∝ IN DEGREES	DIMENSIONS								MAX ENG TORQUE (IN-LBS)	MIN DIS-ENG TORQUE (IN-LBS)	CONTACT ARRANGEMENT MATING FACE VIEW SEE NOTE	MANUFACTURER'S PART NUMBER (REF)
			A MAX	B	C	D	E	F	G MAX	H				
-001	12 NO.12	0	1.453	1.161 1.151	1.251 1.245	1.187 1.157	.587 .556	.109 .079	1.250	.125 .115	36	6	 ∝ A J B H K C L M G D E F	22050-20-98S-311
-002		20												22050-20-98SW-311
-003		70												22050-20-98SX-311
-004		169												22050-20-98SY-311
-006	31 NO.16	0	1.703	1.380 1.370	1.501 1.495	1.453 1.423	.620 .589	.109 .079	1.328	.152 .142	38	7	 ∝ A T S B U d R C V e h c P D W b N E f g X a M F Z Y G H J K L	DTK00-24-31S-311
-007		46												DTK00-24-31SW-311
-008		74												DTK00-24-31SX-311
-009		122												DTK00-24-31SY-311

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Parks DATE 15 JUN 65
CHECKED [illegible] 10 Nov 65
APPROVAL R. Trummer 15 Nov 65
APPROVAL [illegible] 1-11-66
A. C. METZGER
NASA APPROVAL
MIT APPROVAL [illegible] 14 Jan 66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—SQUARE FLANGE, BAYONET LOCKING COUPLING, CRIMP TYPE SOCKET CONTACTS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897288
SCALE NONE
SHEET 2 of 2

REVISIONS 23388					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23388		9 SEP 65	DKD

REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   C. PARTS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482.

NASA DASH NUMBER	MANUFACTURER'S PART NUMBER (REF)
-001	22638-24-31PP
-002	22638-24-31PPW
-003	22638-24-31PPX
-004	22638-24-31PPY

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Sullivan DATE 17 JUN 65
CHECKED D Fox 21 JUN 65
APPROVAL R. Tr[illegible] 21 Jun 65
APPROVAL C Gedeman
NASA APPROVAL R C [illegible]
MIT APPROVAL W [illegible] 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
H.S. THROUGH BULKHEAD,
JAM NUT PANEL MOUNT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897289
SCALE NONE
SHEET 1 of 1

MIL 1077C—P

REVISIONS 23388					
SYM	ZONE	DESCRIPTION		DATE	APPD.
B		REPLACES REV A WITH CHANGE PER TDRR 24633	CHG NO.	8 NOV 65	J J J

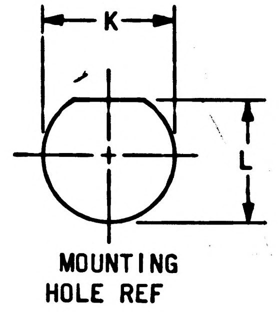
REQUIREMENTS:

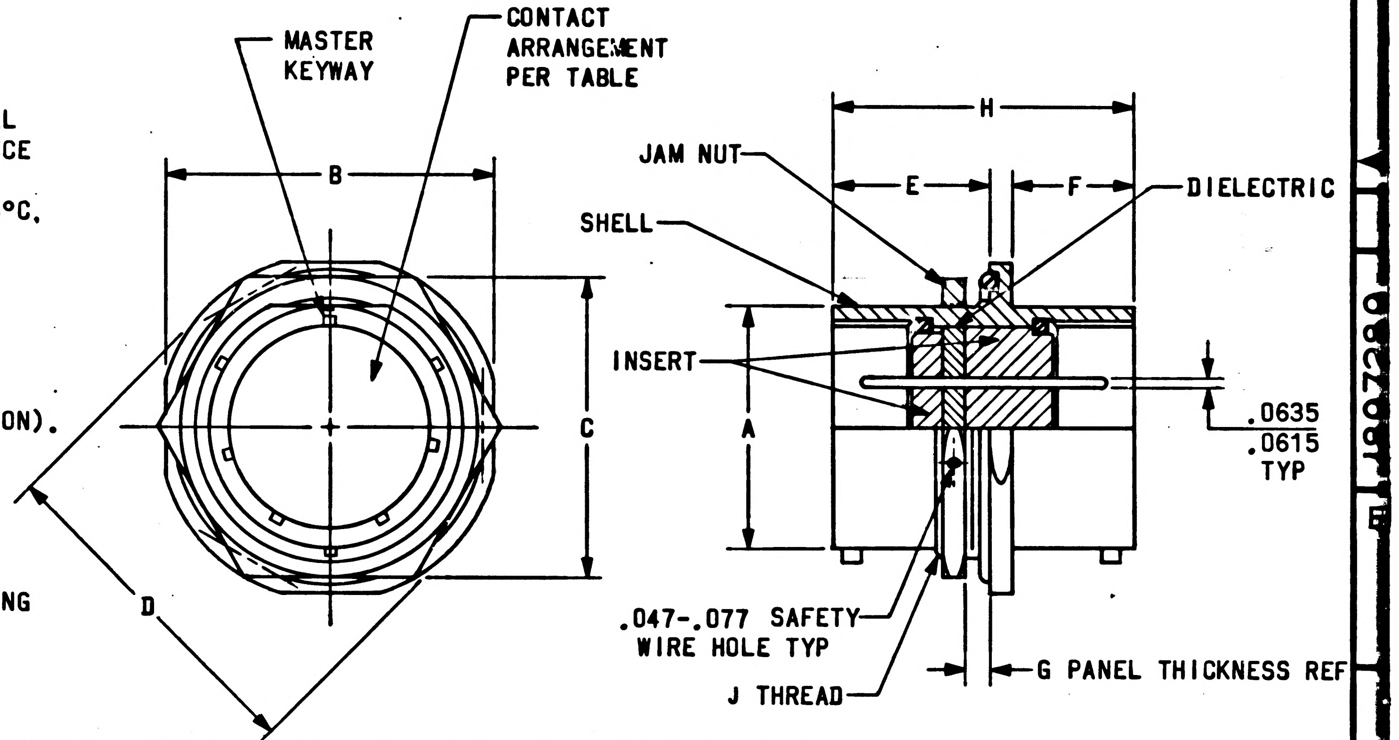
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. PARTS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)
   - B. LEAKAGE: SHALL PREVENT LEAKAGE IN EXCESS OF 0.1 MICRON PER CUBIC FOOT PER HOUR WHEN SUBJECTED TO A PRESSURE DIFFERENTIAL OF 1 ATMOSPHERE ACROSS THE CONNECTOR WHEN TESTED IN ACCORDANCE WITH MIL-C-26482.
   - C. INSULATION RESISTANCE (AT 500 VDC): 5000 MEGOHMS MIN, AT 25°C. 50 MEGOHMS, MIN AT +125°C.

3. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL: MILD COLD ROLLED STEEL.
       - (b) CONTACTS: NICKEL-IRON ALLOY (51% NICKEL, BALANCE IRON).
       - (c) DIELECTRIC: CONTINUOUS COMPRESSION GLASS.
       - (d) INSERTS AND O-RINGS: SILICONE ELASTOMER.
     - (2) FINISH:
       - (a) SHELL AND CONTACTS: CLEAR CADMIUM FINISH.
     - (3) COUPLING MECHANISM: BAYONET LOCKING COUPLING.
     - (4) MAX ENGAGEMENT FORCE; MIN DISENGAGEMENT FORCE: PER MATING CONNECTOR.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 20 AMP.
     - (2) VOLTAGE RATING: 1500 VOLTS RMS AT SEA LEVEL.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 1500 VOLTS RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE (MEASURED FROM REAR OF SOCKET CONTACT CRIMP BARREL TO OPPOSITE END OF HERMETIC PIN CONTACT): 50 MILLIVOLTS, MAX, AT 20 AMPERES.
     - (5) OPERATING TEMPERATURE: -55°C TO +125°C.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.





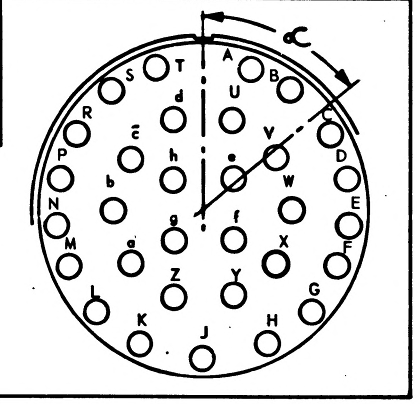
Ⓑ REPLACES REV A WITH CHANGE BLOCK II/LEM

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	DRAWN Bender DATE 17-JUN-65 CHECKED Ed Foster 22 OCT 65 APPROVAL R. Trummer 22 Oct 65 APPROVAL C. Hermon Jr 12-1-65	CONNECTOR, RECEPTACLE, ELECTRICAL - H.S. THROUGH BULKHEAD, JAM NUT PANEL MOUNT SPECIFICATION CONTROL DRAWING	
MATERIAL SEE REQUIREMENTS	A. C. METZGER NASA APPROVAL	CODE IDENT NO. 99974	SIZE C — 1897289
CONTRACT NAS9-497	MIT APPROVAL W. Kupfer 7 Dec 65	SCALE NONE	SHEET 1 OF 2

NEXT ASSY	USED ON
APPLICATION	

MIL 1077C—P

REVISIONS 23388					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		THIS SHEET ADDED PER TDRR 24633		8 NOV 65	J J J

DASH NUMBER	α IN DEGREES	MANUFACTURER'S PART NUMBER (REF)	NO. AND SIZE OF CONTACTS	DIMENSIONS A	B	C	D MAX	E	F	G MIN	G MAX	H	J	K	L	CONTACT ARRANGEMENT (LEFT FACE OR JAM NUT VIEW) SEE NOTE 2
-001	0	22638-24-31PP	31 NO. 16	1.501 1.495	2.078 2.046	1.828 1.796	2.203	.943 .912	.526 .496	.062	.250	1.588 1.548	1-5/8-18NEF-2A	1.644 1.634	1.575 1.565	
-002	46	22638-24-31PPW														
-003	74	22638-24-31PPX														
-004	122	22638-24-31PPY														

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. MATES WITH APPLICABLE CONNECTOR PLUG PER 1897259.
2. INSERT SHOWN IN NORMAL POSITION (α = 0°); FOR ALTERNATE POSITIONS, INSERT ROTATED SPECIFIED NUMBER OF DEGREES CLOCKWISE RELATIVE TO THE MASTER KEYWAY.

Ⓑ **THIS SHEET ADDED**

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bender DATE 17 JUN-65
CHECKED Ed Foster 22 OCT 65
APPROVAL R. Trummer 22 Oct 65
APPROVAL 12-1-65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7 Dec 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL - H.S. THROUGH BULKHEAD, JAM NUT PANEL MOUNT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897289
SCALE
SHEET 2 OF 2

MIL 1077C—P

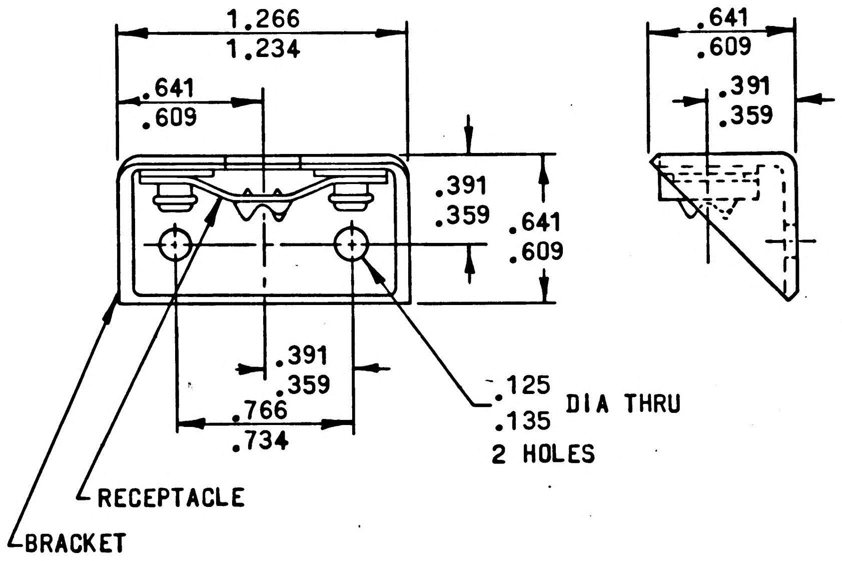
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23557		19 OCT 65	7E / CW

REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   A. MATERIAL:
      (1) BRACKET: SAE 1010 STEEL.
      (2) RECEPTACLE: SAE 1060-1070 STEEL.
   B. FINISH:
      (1) BRACKET AND RECEPTACLE: CADMIUM PLATE PER QQ-P-416, TYPE II, CLASS 1.
   C. MARKING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION PER MIL-STD-129:
      SUPPLIER'S NAME OR SYMBOL
      NASA PART NUMBER
      MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   A. TO SELECT LENGTH OF ASSOCIATED STUD, MEASURE DISTANCE FROM OUTER SURFACE OF PANEL TO TOP SURFACE OF BRACKET. ADD 0.062 AND CONSIDER THIS AS THE "TOTAL MATERIAL THICKNESS" TO BE FASTENED.



NASA DASH NUMBER	MANUFACTURER'S PART NUMBER FOR REFERENCE
-001	82-45-101-15

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Wolski DATE 23 JUN 65
CHECKED Ed Foster 28 JUN 65
APPROVAL 28 JUN 65
APPROVAL 10-22-65
NASA APPROVAL
MIT APPROVAL 25 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

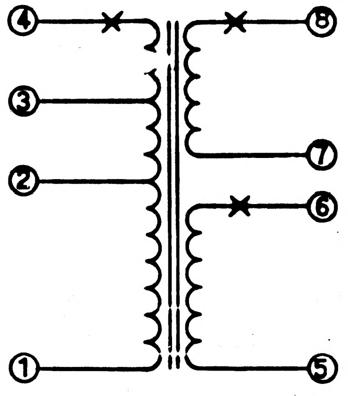
RECEPTACLE, TURNLOCK FASTENER—
1/4 TURN, SIDE MOUNT, NO. 2

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897290
SCALE NONE
SHEET 1 of 1

REQUIREMENTS:

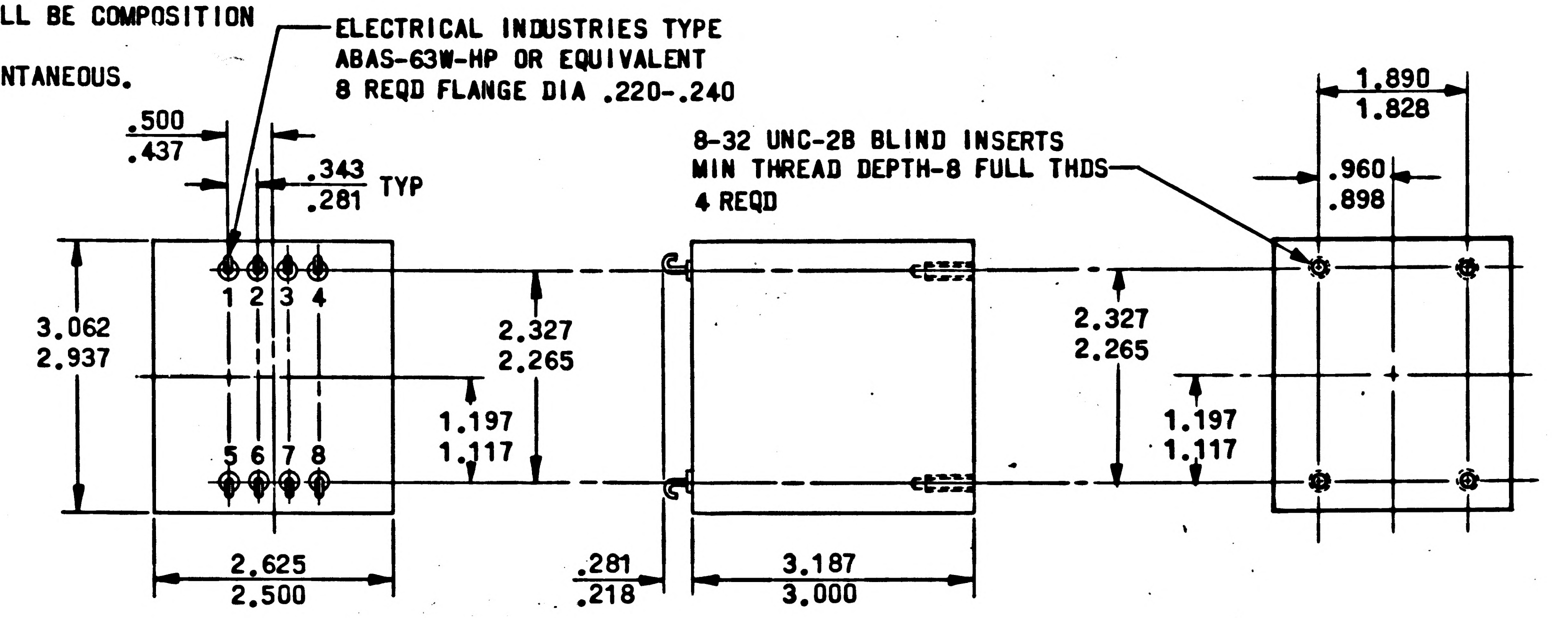
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. DESIGN TO BE IN CONFORMANCE WITH SPECIFICATION MIL-T-27.
   - D. BUSH TRANSFORMER PART NUMBER EJ-5038. (FOR REF)
   - E. TRANSFORMER DESIGN PART NUMBER TD 1032 (FOR REF)
2. INSPECTION AND ACCEPTANCE:
   - A. UNIT SHALL MEET ALL REQUIREMENTS OF TABLE I.
   - B. COLOR: UNIT SHALL BE FINISHED WITH COLOR 514 OF ANA BULLETIN 157 (INSTRUMENT BLACK).
   - C. MARKING: MARK PERMANENTLY AND LEGIBLY WITH THE NASA DRAWING NUMBER PLUS ALL MARKING REQUIREMENTS OF MIL-T-27. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON PART AND PACKAGE.
3. DESIGN:
   - A. THE UNIT SHALL MEET ALL REQUIREMENTS OF MIL-T-27 FOR GRADE 4, CLASS S, LIFE EXPECTANCY X, FAMILY 02 IN AN AMBIENT TEMPERATURE OF 65°C EXCEPT PARAGRAPH 3.2 AND LIFE TEST UNDER GROUP C INSPECTION TESTS WHICH SHALL BE WAIVED.
   - B. ALTITUDE: 10,000 FEET OPERATING, 50,000 FEET NON-OPERATING.
   - C. AMBIENT OPERATING TEMPERATURE RANGE: 0°C TO +65°C.
   - D. SOLDER USE FOR ELECTRICAL CONNECTIONS SHALL BE COMPOSITION SN 60 PER QQ-S-571.
   - E. MAXIMUM WORKING VOLTAGE: 355 VOLTS INSTANTANEOUS.
   - F. REGULATION: 8% MAXIMUM



SCHEMATIC DIAGRAM

VOLTAGES AND CURRENTS ARE RMS VALUES UNLESS OTHERWISE NOTED.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACES ISSUE (-) WITH CHANGE PER MXC 203277		26 JUL 65	SRA RWH
B		INITIAL RELEASE CLASS A PER TDRR 24042		10-18-65	mrc cw


ELECTRICAL INDUSTRIES TYPE
ABAS-63W-HP OR EQUIVALENT
8 REQD FLANGE DIA .220-.240
.500
.437
.343
.281
TYP
1 2 3 4
5 6 7 8
3.062
2.937
2.327
2.265
1.197
1.117
2.625
2.500
.281
.218
3.187
3.000
8-32 UNC-2B BLIND INSERTS
MIN THREAD DEPTH-8 FULL THDS
4 REQD
1.890
1.828
.960
.898
2.327
2.265
1.197
1.117

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+____ +____ +____
-    -   -
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN WEISSERT DATE 19 JUN 65
CHECKED M. MANNING 24 JUN 65
APPROVAL E. FULLER 24 JUN 65
APPROVAL L Goldman 10/20/65
NASA APPROVAL A. C. METCALF
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, POWER, STEP-DOWN—
113/115/117-40/28.1 VOLTS,
60 CPS, 42.2 VA
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897291
SCALE NONE
SHEET 1 of 2

MIL 1077C—P

TABLE I

INSPECTION TESTS

TITLES IN PARAGRAPH COLUMN REFER TO PARAGRAPH TITLES IN SPECIFICATION MIL-T-27

PARAGRAPH	
SEALING	IMMERSE IN LIQUID AS INDICATED.
DIELECTRIC STRENGTH	APPLY 1000 VOLTS (RMS) BETWEEN WINDINGS AND BETWEEN WINDINGS AND CASE.
INDUCED VOLTAGE	APPLY 234 VOLTS, 120 CPS TO TERMINALS (1-4), SECONDARY OPEN
INSULATION RESISTANCE	10,000 MEGOHMS MINIMUM AT 25°C
RATED LOAD	WITH ANY ONE OF THE FOLLOWING INPUTS, 113 VOLTS (1-2); 115 VOLTS (1-3) OR 117 VOLTS (1-4), 60 CPS THE FULL LOAD OUTPUT VOLTAGE SHALL BE: UNIT AT 25°C V(5-6) = 40.0 ± 1.2 VOLTS (RMS) WITH 0.1 AMPERE DC LOAD (5-6) V(7-8) = 28.1 ± 0.5 VOLTS (RMS) WITH 2.0 AMPERE DC LOAD (7-8) OVER AMBIENT TEMPERATURE RANGE OF 0°C TO +65°C (SAMPLE INSPECTION) V(5-6) = 40.0 ± 2.0 VOLTS (RMS) WITH 0.1 AMPERE DC LOAD (5-6) V(7-8) = 28.1 ± 1.1 VOLTS (RMS) WITH 2.0 AMPERE DC LOAD (7-8) LOADS ARE SIMULTANEOUS. (LOADS ARE FULL WAVE BRIDGE RECTIFIER WITH CAPACITOR INPUT FILTER)
POLARITY	TERMINALS 4, 6 AND 8 ARE OF LIKE POLARITY
TEMPERATURE RISE	SHALL NOT EXCEED 65°C AT FULL LOAD. (SAMPLE INSPECTION)

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISION STATUS CHANGED		26 JUL 65	SRA RWH
B		INITIAL RELEASE CLASS A PER TDRR 24041		10-18-65	MRC

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ___
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Weissert DATE 18-JUN-65
M. Manning 24 JUN 65
CHECKED
E. Fuller 24 JUN 65
APPROVAL
APPROVAL L Gedeman 10/29/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 16 Nov 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, POWER, STEP-DOWN—
113/115/117-40/28.1 VOLTS,
60 CPS, 42.2 VA
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897291
SCALE ——
SHEET 2 of 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACES REV (-) WITH CHANGE PER MXC- 205999		19-OCT 65	B. Gm
B		INITIAL RELEASE CLASS A PER TDRR 23555		19 OCT 65	WRB CW

REQUIREMENTS:

1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   C. SOLA PART NUMBER 25357 (FOR REF).

2. INSPECTION AND ACCEPTANCE:
   A. COLOR: UNIT SHALL BE FINISHED WITH COLOR 514 OF ANA BULLETIN 157 (INSTRUMENT BLACK).
   B. MARKING: THE DOT ON THE TRANSFORMER AND CAPACITOR SHALL BE OF LIKE COLOR.
   C. ELECTRICAL REQUIREMENTS: (USE MIL-T-27 TEST METHODS) (TEST DATA NOT REQUIRED FROM SUPPLIER) FOR PERFORMANCE TEST, CONNECT PER SCHEMATIC DIAGRAM.
      (1) NO LOAD VOLTAGE: WITH AN INPUT E_{PRI} (BLACK LEADS) OF 115 VOLTS ±10%, 60 CPS, THE NO LOAD OUTPUT VOLTAGE (GREEN LEADS) SHALL BE 38 VOLTS MAXIMUM.
      (2) FULL LOAD VOLTAGE:
         (a) WITH AN INPUT OF 103.5 VOLTS (RMS), 60 CPS TO BLACK LEADS, THE FULL LOAD OUTPUT VOLTAGE (GREEN LEADS) SHALL BE 36.00 VOLTS ±2% WITH A 3.5 AMPERE LOAD ACROSS GREEN LEADS.
         (b) WITH AN INPUT OF 126.5 VOLTS (RMS), 60 CPS TO BLACK LEADS, THE FULL LOAD OUTPUT VOLTAGE GREEN LEADS SHALL BE 36.00 VOLTS ±2% WITH A 3.5 AMPERE LOAD ACROSS GREEN LEADS.
      (3) DISTORTION: MAXIMUM OUTPUT DISTORTION AT 3.5 AMP LOAD WITH 126.5V. INPUT SHALL BE 3%.
      (4) TEMPERATURE RISE: SHALL NOT EXCEED 65°C AT FULL LOAD WITH EITHER 103.5 OR 126.5 VOLTS (RMS) INPUT TO BLACK LEADS.

3. DESIGN:
   A. THE UNIT SHALL MEET ALL ELECTRICAL REQUIREMENTS, EXCEPT WHERE NOTED, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING CONDITIONS:
      (1) TEMPERATURE:
         (a) OPERATING: 0°C TO +65°C.
         (b) NON-OPERATING: -37°C TO +75°C.
      (2) HUMIDITY: 95%, 96 HOURS.
      (3) SHOCK: 20G, 11 MILLISEC., TOTAL 18 SHOCKS.
      (4) VIBRATION: .25" 5G, 5-500 CYCLES, TOTAL 3 CYCLES.
      (5) ALTITUDE:
         (a) OPERATING: 10,000 FEET.
         (b) NON-OPERATING: 50,000 FEET.
      (6) SALT SPRAY: 50 HOURS, 20% SOLUTION.
      (7) RADIO INTERFERENCE: PER MIL-I-26600.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	1897369	TRANSFORMER
2	1	1897358	CAPACITOR, 3.5 MFD CAPACITANCE
1	1	1897359	RETAINER, CAPACITOR

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bender DATE 18-JUN-65
CHECKED Ed Foster 22-JUN-65
APPROVAL E. Fuller 23-JUN-65
APPROVAL J. M. Watson 10-28-65
NASA APPROVAL
MIT APPROVAL 19 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

REGULATOR SET, VOLTAGE -
104/126 TO 36 VOLTS, 60 CPS, 126 VA

CODE IDENT NO. 99974
SIZE C
1897292
SCALE ——
SHEET 1 OF 2

1897292 B

REVISIONS

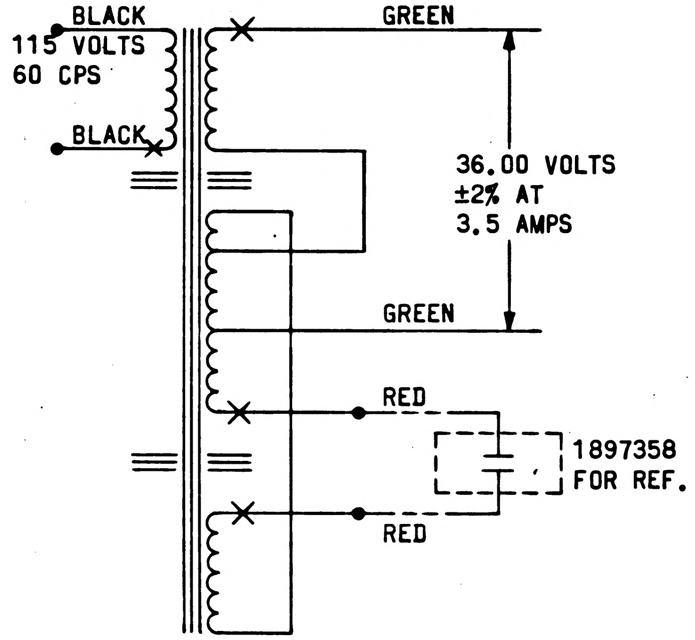
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACES REV (-) WITH CHANCE PER MXC-205999		19-OCT-65	B.
B		INITIAL RELEASE CLASS A PER TDRR 23555		19-OCT 65	WRB CW

REQUIREMENTS: (CONTINUED)

B. FULL LOAD VOLTAGE: WITH AN INPUT OF 115 VOLTS ± 10%, 60 CPS, THE FULL LOAD OUTPUT VOLTAGE (GREEN LEADS) SHALL BE 36.00 VOLTS ±2% WITH A 3.5 AMPERE LOAD ACROSS GREEN LEADS.

C. THIS VOLTAGE REGULATOR SHALL CONSIST OF THE FOLLOWING COMPONENTS:

(1) TRANSFORMER	1897369 (REF)
(2) CAPACITOR, 3.5 MFD CAPACITANCE	1897358 (REF)
(3) RETAINER, CAPACITOR	1897359 (REF)



SCHEMATIC DIAGRAM

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + – DECIMALS + – ANGLES + –
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bender DATE 18-JUN-65
CHECKED Ed Foster 22-JUN-65
APPROVAL E. Fuller 23-JUN-65
APPROVAL J. M. Watson 10-28-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

REGULATOR SET, VOLTAGE -
104/126 TO 36 VOLTS, 60 CPS, 126 VA

CODE IDENT NO. 99974
SIZE C
1897292
SCALE ——
SHEET 2 OF 2

MIL 1077C—P

REVISIONS					23379
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23379		18 OCT 65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIALS:
     - (1) CHANNELS AND TRACKS: 2024-T4 ALUMINUM ALLOY PER QQ-A-250/4, OR QQ-A-200/3
     - (2) BALLS: 440C STAINLESS STEEL HARDENED TO $R^{\underline{C}}$ 56-59 PER AMS 7445.
   - B. FINISH:
     - (1) ALUMINUM PARTS: CLEAR SULFURIC ACID ANODIZE (HOT WATER SEAL) PER MIL-A-8625A, TYPE II.
     - (2) FERROUS PARTS: PASSIVATE PER MIL-S-5002.
   - C. MARKING:
     - (1) PIECEMARKING: PART SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE NASA DRAWING NUMBER AND DASH NUMBER.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA DRAWING NUMBER
       - DASH NUMBER
       - DATE CODE, OR DATE OF MANUFACTURE
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.
   - D. CONSTRUCTION:
     - (1) SLIDES MUST BE EQUIPPED WITH REST PINS.
     - (2) SLIDES TO LOCK IN OPEN POSITION ONLY. UNLOCK BEHIND FRONT PANEL.

3. DESIGN:
   - A. BASIC LOAD CAPACITY: 200 LBS FOR 18 INCHES LONG -17 INCHES TRAVEL.
   - B. LOAD CAPACITY (PER PAIR OF SLIDES): 40 INCHES LONG -39 INCHES TRAVEL = 130 LBS.
   - C. MOUNTING SPACE: EACH SIDE OF CABINET = 1 $\frac{3}{16}$ INCHES.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ − DECIMALS + ___ − ANGLES + ___ −
DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Patterson DATE 30 JUN 65
CHECKED Ed Foster 2 JUL 65
APPROVAL Halzam 6 JUL 65
APPROVAL Goldman 10/13/65
NASA APPROVAL A. C. Metz
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

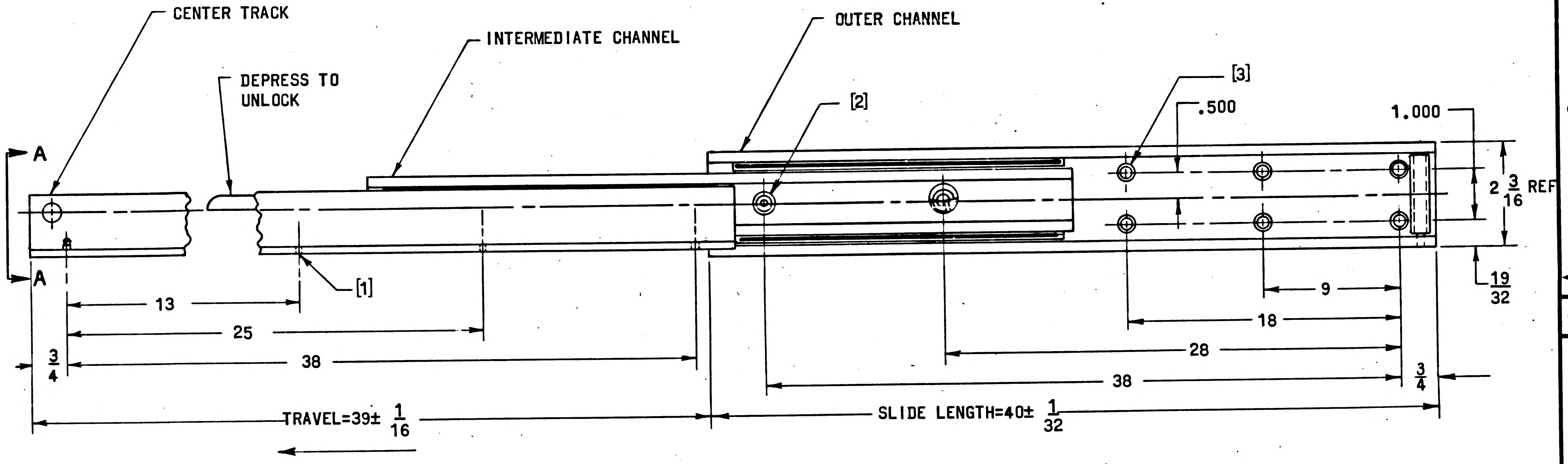
SLIDE ASSEMBLY, STATIONARY AND INTERMEDIATE SECTION, LEFT HAND - ONE REST PIN AND LOCK SPECIFICATION CONTROL DRAWING

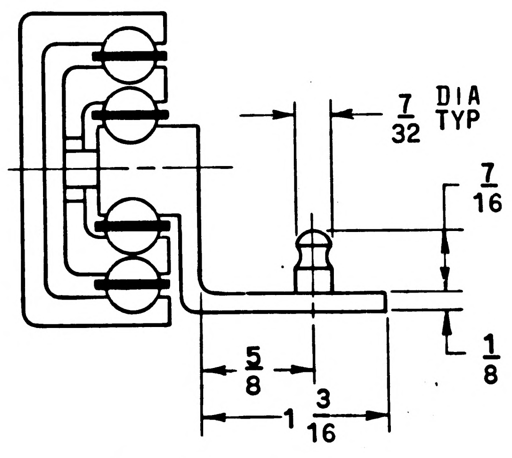
CODE IDENT NO. 99974 SIZE C 1897297
SCALE NONE SHEET 1 OF 2

1897297 A

REVISIONS 23379					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23379		18 OCT 65	PT

NOTES:
1. 4 MOUNTING HOLES .177 DIA FOR NO. 8 R.H.M.S.
2. 1 ACCESS HOLE 1/2 INCH DIA.
3. 8 MOUNTING HOLES .177 DIA & CSK 82° FOR NO. 8 F.H.M.S.
4. DECIMAL TOLERANCES APPLY TO MOUNTING HOLE LOCATIONS.
5. WT. 7.8 WEIGHT IN LBS./SLIDE (NOT PAIR), ROUNDED OFF TO ONE DECIMAL. MOUNTING SCREWS ARE NOT INCLUDED AND NOT FURNISHED.


CENTER TRACK
INTERMEDIATE CHANNEL
OUTER CHANNEL
DEPRESS TO UNLOCK
A
A
[1]
[2]
[3]
.500
1.000
2 3/16 REF
19/32
13
25
38
3/4
9
18
28
38
3/4
TRAVEL=39± 1/16
SLIDE LENGTH=40± 1/32


7/32 DIA TYP
7/16
1/8
5/8
1 3/16

VIEW A-A
SCALE 2:1

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Patterson DATE 30 JUN 65
CHECKED Ed Foster 2 JUL 65
APPROVAL Hal Kane 6 JUL 65
APPROVAL E Johman 10/13/65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE ASSEMBLY, STATIONARY AND
INTERMEDIATE SECTION, LEFT HAND -
ONE REST PIN AND LOCK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897297
SCALE — SHEET 2 OF 2

MIL 1077C-P

REVISIONS 23379					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23379		18 OCT 65	PT 76

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIALS:
     - (1) CHANNELS AND TRACKS: 2024-T4 ALUMINUM ALLOY PER QQ-A-250/4, OR QQ-A-200/3
     - (2) BALLS: 440C STAINLESS STEEL HARDENED TO R_C 56-59 PER AMS 7445.
   - B. FINISH:
     - (1) ALUMINUM PARTS: CLEAR SULFURIC ACID ANODIZE (HOT WATER SEAL) PER MIL-A-8625A, TYPE II.
     - (2) FERROUS PARTS: PASSIVATE PER MIL-S-5002.
   - C. MARKING:
     - (1) PIECEMARKING: PART SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE NASA DRAWING NUMBER AND DASH NUMBER.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA DRAWING NUMBER
       - DASH NUMBER
       - DATE CODE, OR DATE OF MANUFACTURE
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.
   - D. CONSTRUCTION:
     - (1) SLIDES MUST BE EQUIPPED WITH REST PINS.
     - (2) SLIDES TO LOCK IN OPEN POSITION ONLY. UNLOCK BEHIND FRONT PANEL.

3. DESIGN:
   - A. BASIC LOAD CAPACITY: 200 LBS FOR 18 INCHES LONG -17 INCHES TRAVEL.
   - B. LOAD CAPACITY (PER PAIR OF SLIDES): 40 INCHES LONG -39 INCHES TRAVEL = 130 LBS.
   - C. MOUNTING SPACE: EACH SIDE OF CABINET = 1-3/16 INCHES.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ −
DECIMALS + ___ −
ANGLES + ___ −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Patterson DATE 30 JUN 65
CHECKED Ed Foster 2 JUL 65
APPROVAL 6 JUL 65
APPROVAL Gelman 7/13/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE ASSEMBLY, STATIONARY AND
INTERMEDIATE SECTION, RIGHT HAND -
ONE REST PIN AND LOCK

SPECIFICATION CONTROL DRAWING

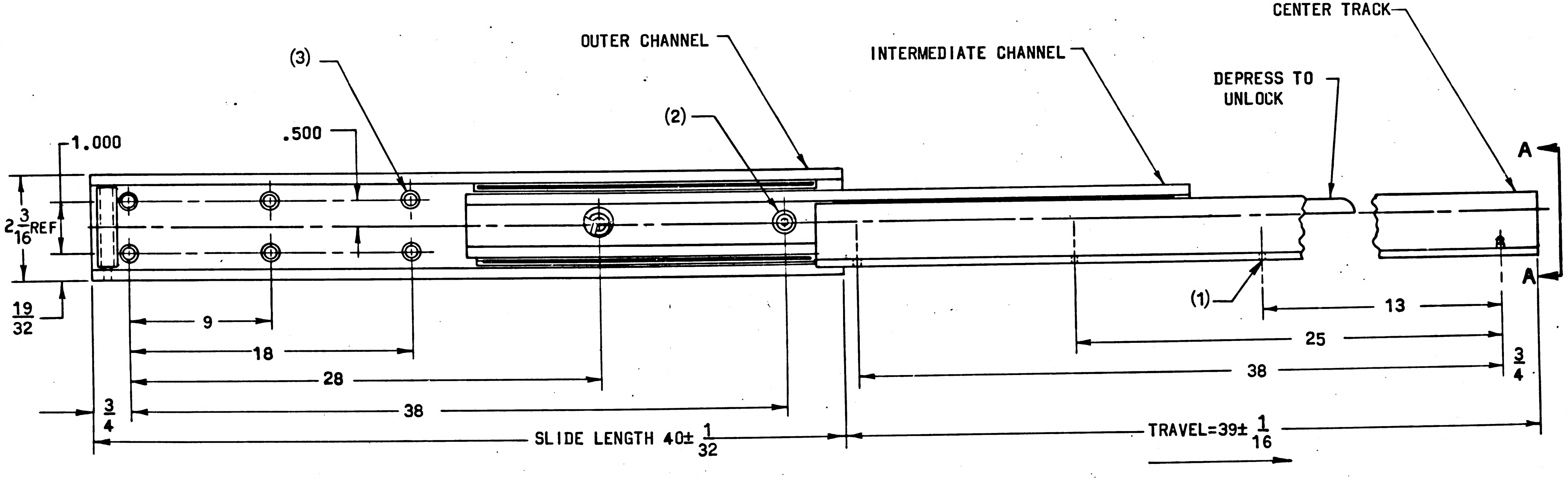
CODE IDENT NO. 99974
SIZE C
1897298
SCALE NONE
SHEET 1 OF 2

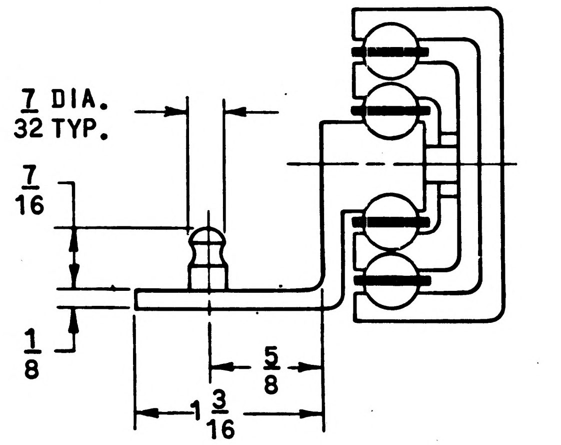
MIL 1077C—P

REVISIONS 23379					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23379		18 OCT 65	JR

NOTES:

1. 4 MOUNTING HOLES .177 DIA FOR NO. 8 R.H.M.S.
2. 1 ACCESS HOLE 1/2 INCH DIA.
3. 8 MOUNTING HOLES .177 DIA & CSK 82° FOR NO. 8 F.H.M.S.
4. DECIMAL TOLERANCES APPLY TO MOUNTING HOLE LOCATIONS.
5. WT. 7.8 WEIGHT IN LBS./SLIDE (NOT PAIR), ROUNDED OFF TO ONE DECIMAL. MOUNTING SCREWS ARE NOT INCLUDED AND NOT FURNISHED.


CENTER TRACK
OUTER CHANNEL
INTERMEDIATE CHANNEL
DEPRESS TO UNLOCK
(3)
(2)
(1)
1.000
.500
A
A
2 3/16 REF
19/32
9
18
28
38
3/4
SLIDE LENGTH 40± 1/32
13
25
38
3/4
TRAVEL=39± 1/16


7/32 DIA. TYP.
7/16
1/8
5/8
1 3/16

VIEW A-A
SCALE 2:1

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S Patterson DATE 30 JUN 65
CHECKED Ed Foster 2 JUL 65
APPROVAL Hal Kane 6 Jul 65
APPROVAL C Gedman 10/4/65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SLIDE ASSEMBLY, STATIONARY AND INTERMEDIATE SECTION, RIGHT HAND - ONE REST PIN AND LOCK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897298
SCALE		SHEET 2 OF 2

MIL 1077C—P

21

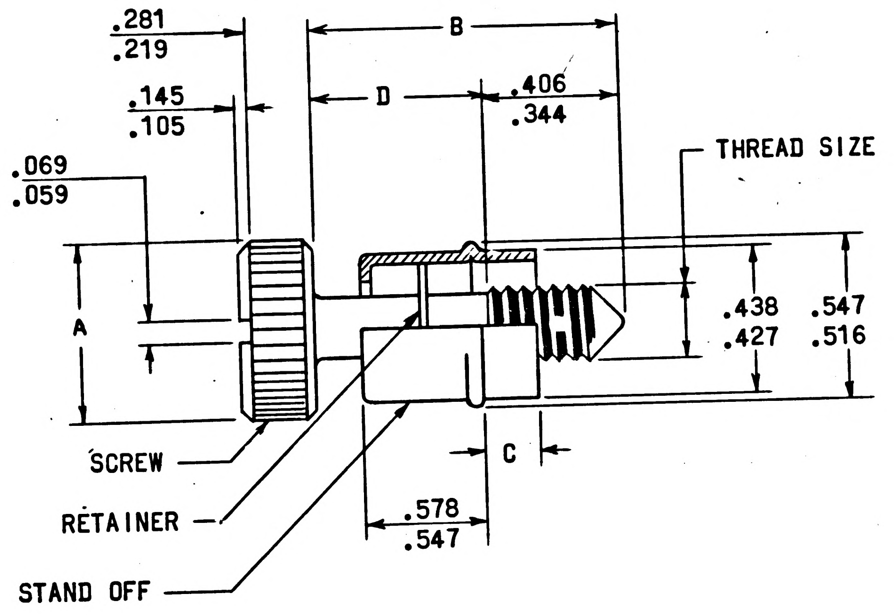
REVISIONS 23391					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 205497		30 SEP 65	J.K. / EF
B		INITIAL RELEASE CLASS A PER TDRR 23391		19OCT 65	JE / cw

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) SCREW: STAINLESS STEEL, TYPE 303, PER MIL-S-7720, COMPOSITION FMS.
     - (2) STANDOFF: STAINLESS STEEL, TYPE 305, PER AMS 5514A.
     - (3) RETAINER: STAINLESS STEEL, TYPE 302, PER MIL-S-5059, COMPOSITION 302.
   - B. FINISH: ALL PARTS PASSIVATED PER MIL-F-14072, FINISH E300.
   - C. MARKING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION PER MIL-STD-129:
     SUPPLIER'S NAME OR SYMBOL AND THE NASA PART NUMBER.
     MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. SEE "PREPARATION AND INSERTION" VIEW FOR RECOMMENDED INSTALLATION IN DIFFERENT THICKNESS PANELS.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Armijo 29 JUN 65 DATE
CHECKED M. Manning 2 JUL 65
APPROVAL 2 JUL 65
APPROVAL C. Gedeman 10/19/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, PANEL FASTENER -
RETRACTABLE, CAPTIVATED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897299
SCALE —— SHEET 1 OF 2

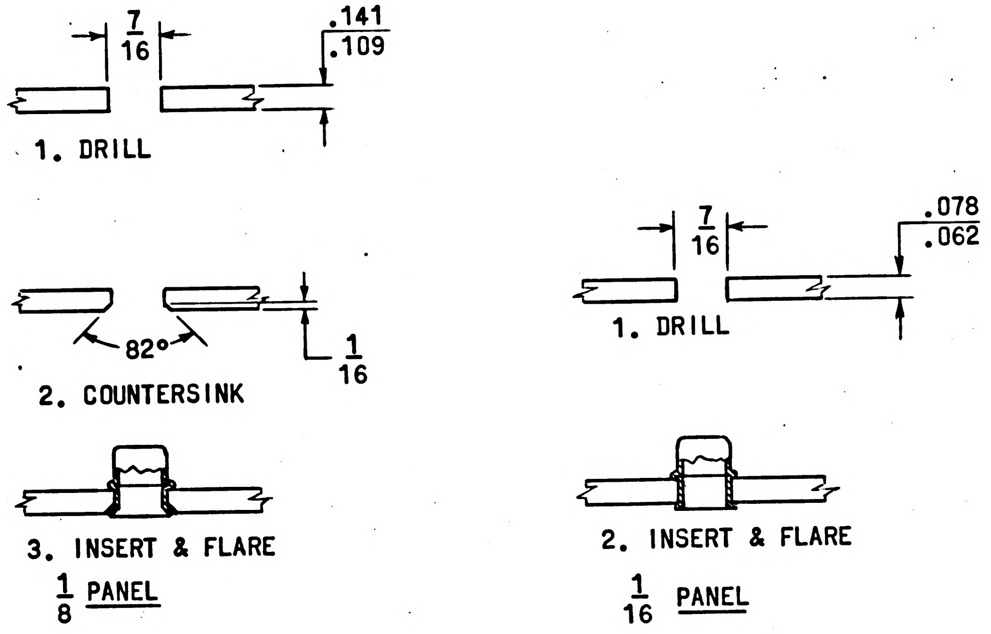
MIL 1077C—P

REVISIONS 23391

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC205497		30 SEP 65	J.K. EF
B		INITIAL RELEASE CLASS A PER TDRR 23391		19 OCT 65	FE

NASA DASH NUMBER	THREAD SIZE	B	D		A	C		MANUFACTURER'S PART NUMBER FOR REFERENCE
		REF	MAX	MIN	MAX	MAX	MIN	
-001	1/4-28 UNF-2A	.937	.578	.547	.750	.132	.118	54-34-109-24
-002	1/4-28 UNF-2A	1.125	.766	.734	.750	.132	.118	54-34-112-24
-003	1/4-28 UNF-2A	1.000	.641	.609	.750	.132	.118	54-34-110-24

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PREPARATION AND INSERTION
(FOR REFERENCE)

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ + +
− − −
DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 29 JUN 65

CHECKED 2 JUL 65

APPROVAL

APPROVAL L Gelman 10/19/65

NASA APPROVAL

MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, PANEL FASTENER -
RETRACTABLE, CAPTIVATED

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974

SIZE C

1897299

SCALE NONE

SHEET 2 OF 2

MIL 1077C-P

REVISIONS		ꞓ3392			
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 204912		16 SEP 65	E / EF
B		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC / FE

REQUIREMENTS:

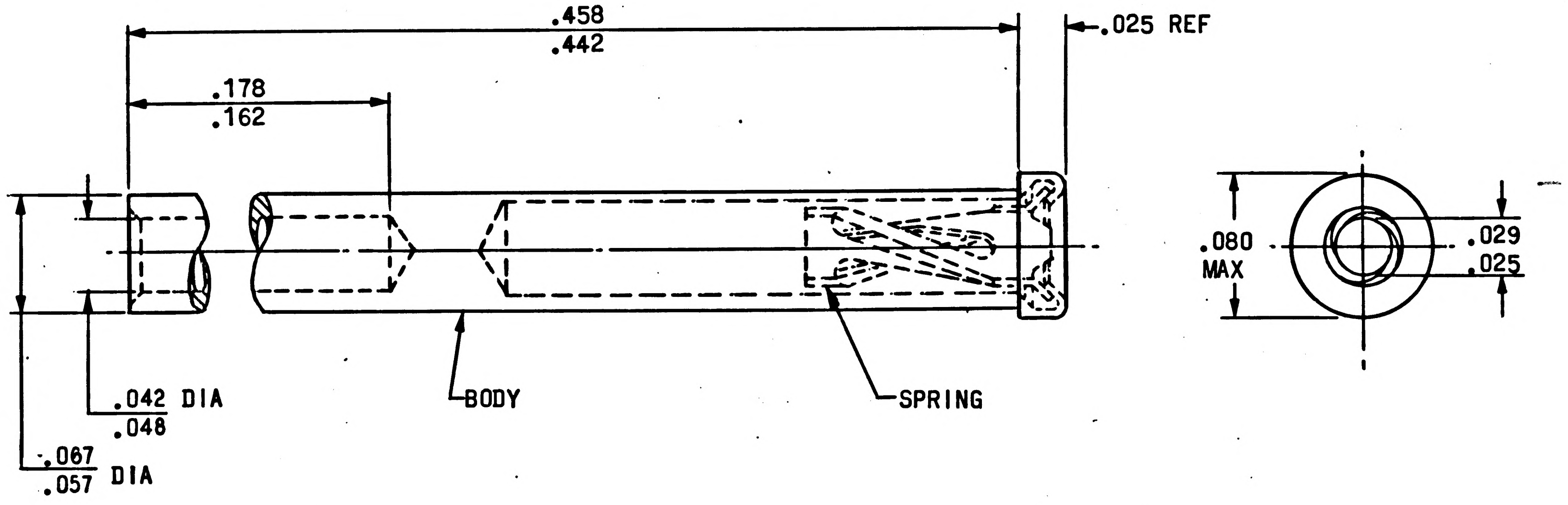
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. DESIGN:
   - A. MECHANICAL:
     - (1) MATERIAL:
       - (a) BODY: BRASS PER QQ-B-626, COMPOSITION 22, 1/2 HARD ROD.
       - (b) SPRING: BERYLLIUM COPPER PER QQ-C-533, HEAT TREATMENT PER MIL-H-7199, ROCKWELL 36 C MINIMUM.
     - (2) PLATING:
       - (a) BODY: .000050 MIN THICKNESS GOLD PLATING PER MIL-G-45204, CLASS 1, TYPE I.
       - (b) SPRING: .000050 MIN THICKNESS GOLD PLATING PER MIL-G-45204, CLASS 1, TYPE II.
   - B. ELECTRICAL:
     - (1) CURRENT RATING: 5 AMP AC

3. INSPECTION AND ACCEPTANCE:
   - A. CONTACT WITHDRAWAL FORCE: 4 OUNCE MIN WITH A $\begin{smallmatrix}.0321\\.0320\end{smallmatrix}$ DIA HARDENED STEEL GAGE PIN OF 4 RMS MAX SURFACE FINISH.

NASA DASH NUMBER	AWG WIRE SIZE
-001	22-20

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − DECIMALS + — − ANGLES + — −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Janowiak DATE 28 JUN 65
CHECKED W. Diehl 30 JUN 65
APPROVAL W.H.Wilson 30 JUN 65
APPROVAL L Gedimen 10/21/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL - SPRING SOCKET

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897300
SCALE NONE
SHEET 1 OF 1

MIL 1077C—P

REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 204912		16 SEP 65	E / EF
Ⓜ B		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC / FE
C		REVISED PER TDRR-24058		23-NOV-65	B. / CP

REQUIREMENTS:

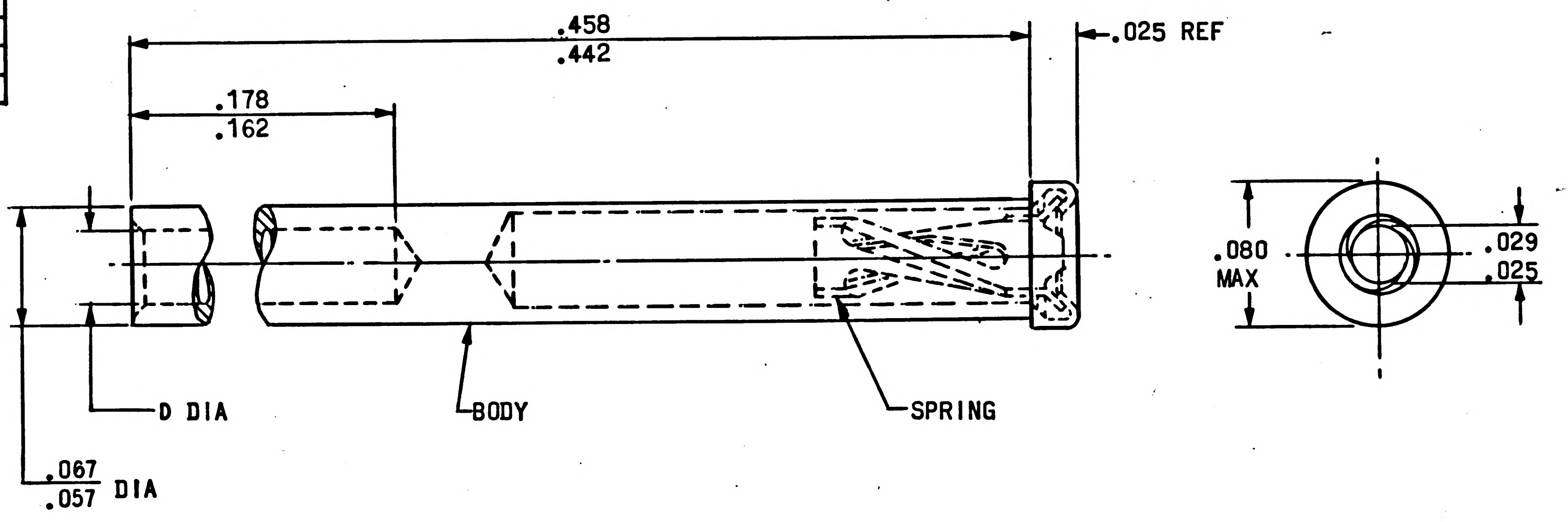
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. DESIGN:
   - A. MECHANICAL:
     - (1) MATERIAL:
       - (a) BODY: BRASS PER QQ-B-626, COMPOSITION 22, 1/2 HARD ROD.
       - (b) SPRING: BERYLLIUM COPPER PER QQ-C-533, HEAT TREATMENT PER MIL-H-7199, ROCKWELL 36 C MINIMUM.
     - (2) PLATING:
       - (a) BODY: .000050 MIN THICKNESS GOLD PLATING PER MIL-G-45204, CLASS 1, TYPE I.
       - (b) SPRING: .000050 MIN THICKNESS GOLD PLATING PER MIL-G-45204, CLASS 1, TYPE II.
   - B. ELECTRICAL:
     - (1) CURRENT RATING: 5 AMP AC

3. INSPECTION AND ACCEPTANCE:
   - A. CONTACT WITHDRAWAL FORCE: 4 OUNCE MIN WITH A $^{.0321}_{.0320}$ DIA HARDENED STEEL GAGE PIN OF 4 RMS MAX SURFACE FINISH.

NASA DASH NUMBER	AWG WIRE SIZE	D DIA ±.003	MANUFACTURERS PART NUMBER REF
-001	20	.045	332179
-002	22	.040	1-332179-0
-003	24	.036	1-332179-1

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ _	+ _	+ _
-	-	-

DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN Janowiak 28 JUN 65 DATE
CHECKED W. Diehl 30 JUN 65
APPROVAL W.H. Wilson Jr. 30 JUN 65
APPROVAL L. Gedıman 10/21/65
NASA APPROVAL G.C. Metzger
MIT APPROVAL W. Kupfer 21 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL - SPRING SOCKET

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897300
SCALE NONE		SHEET 1 OF 1

MIL 1077C—P

W.E.

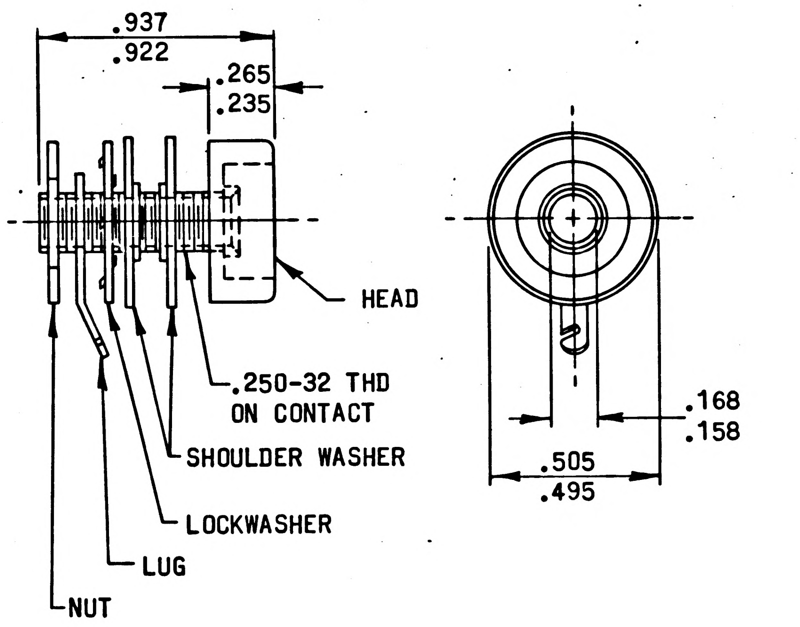
REVISIONS			23407		
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23407		18 OCT 65	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) HEAD: MIL-M-14, CFG
       - (b) CONTACT: BRASS, PER QQ-B-613B, COMP 2.
       - (c) NUT: BRASS PER QQ-B-626B, COMP 22.
       - (d) SHOULDER WASHER: NYLON PER MIL-P-20693, TYPE I.
       - (e) LOCKWASHER: COMMERCIAL STEEL.
       - (f) LUG: COMMERCIAL BRONZE.
     - (2) FINISH:
       - (a) CONTACT: NICKEL PLATED PER QQ-N-290 CLASS 1, TYPE VII.
       - (b) NUT: NICKEL PLATED PER QQ-N-290, CLASS 1, TYPE VII.
       - (c) LOCKWASHER: CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 3.
       - (d) LUG: HOT SOLDER DIP.
   - B. ELECTRICAL:
     - (1) CURRENT: 15 AMP RMS MAX.
     - (2) VOLTAGE: 750 V RMS MAX.
     - (3) CAPACITANCE: 4 MMFD MAX, WHEN MOUNTED ON A .375 THICK PANEL.
3. APPLICATION DATA:
   - A. PART MOUNTS IN A .312 HOLE IN PANELS UP TO .375 THICK.

NASA DASH NUMBER	BODY COLOR
-001	RED
-002	BLACK

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Wolski DATE 28 JUN 65
CHECKED 1 JUL 65
APPROVAL 2 JUL 65
APPROVAL J. M. Watson 10-15-65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

JACK, TIP-BANANA

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897302
SCALE NONE
SHEET 1 OF 1

1897302 A

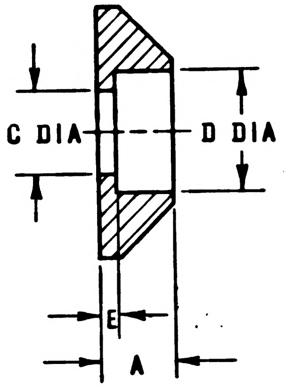
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 24042		10-18-65	MRC / CW

REQUIREMENTS:

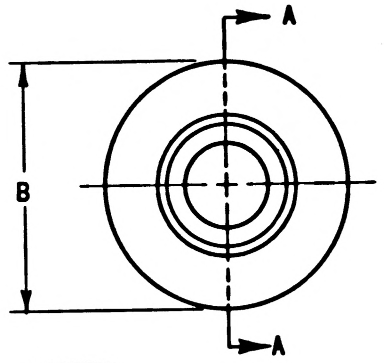
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
     - (2) PACKAGE: INDIVIDUAL AND EXTERNAL PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE SUPPLIER'S NAME AND NASA PART NUMBER.
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.
3. DESIGN:
   - A. MATERIAL: ALUMINUM ALLOY PER QQ-A-225/3.
   - B. FINISH: SATIN ETCH.

NASA DASH NUMBER	A	B DIA	C DIA	D DIA	E	MANUFACTURER'S PART NUMBER (REF)
-001	.219 .156	.380 .370	.208 .198	.265 .255	.067 .057	1670

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



SECTION A-A



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Patterson DATE 1 JUL 65
CHECKED Ed Foster 2 JUL 65
APPROVAL J.V. WEAN 6 JUL 65
APPROVAL L Gedman 10/20/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SPACER, STEPPED - HANDLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897304
SCALE NONE SHEET 1 OF 1

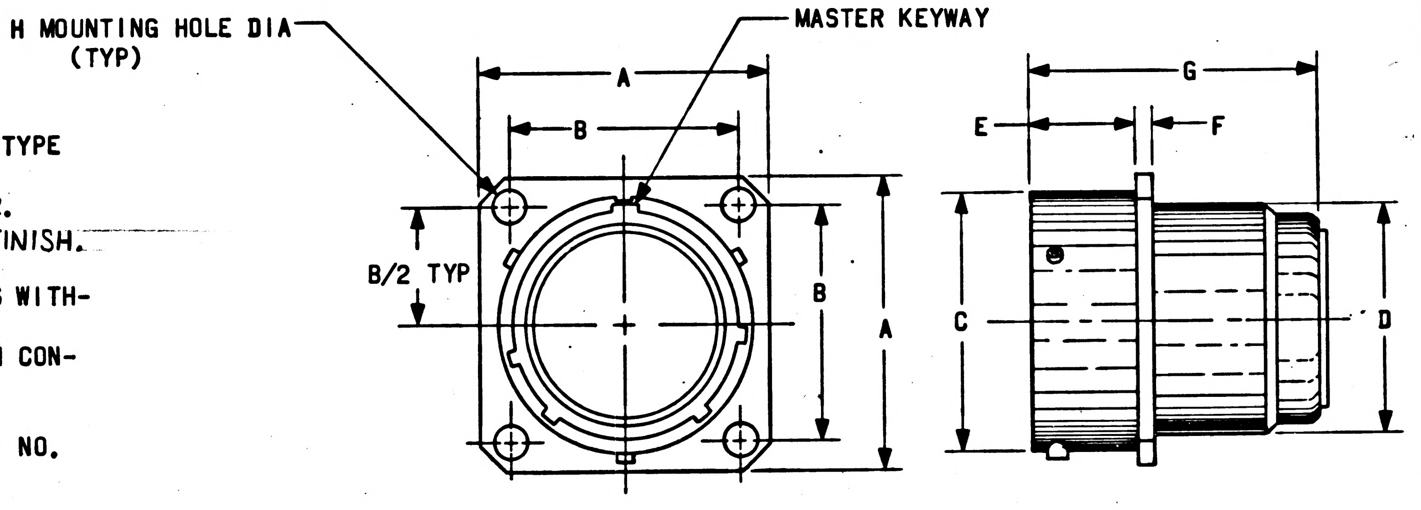
REVISIONS					
SYM	ZONE	DESCRIPTION	~~CHG NO.~~	DATE	APPD.
C		REPLACES REV B WITH CHANGE AND RELEASE PER TDRR 25563		13-JAN-66	B.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS SPECIFIED IN MIL-C-26482 EXCEPT THE SOLVENT IMMERSION REQUIREMENT PER MIL-H-5606.
   - D. 12, MIN, CRIMP TYPE PIN CONTRACTS PER 1897349 AND 2, MIN, SEALING PLUGS PER 1010958 TO BE SUPPLIED WITH EACH UNIT FOR DASH NUMBERS -001 THROUGH -004. 33, MIN, CRIMP TYPE PIN CONTACTS PER 1897346 AND 4, MIN, SEALING PLUGS PER 1010958 TO BE SUPPLIED WITH EACH UNIT FOR DASH NUMBERS -006 THROUGH -009.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, NASA PART NUMBER, AND DATE CODE OR DATE OF MANUFACTURE. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY PER MIL-C-26482.
       - (b) CENTER INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT.
       - (c) FRONT INSERT AND REAR GROMMET: SILICONE RUBBER.
     - (2) FINISH, SHELL: CADMIUM PLATE, CLEAR CHROMATE FINISH.
     - (3) COUPLING MECHANISM: BAYONET LOCKING COUPLING.
     - (4) CONTACT RETENTION: 25 LBS, MIN, IN BOTH DIRECTIONS WITHOUT DISPLACEMENT.
     - (5) MAX ENGAGEMENT FORCE; MIN DISENGAGEMENT FORCE (WITH CONTACTS): PER TABLE I.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: NO. 16 CONTACTS - 20 AMPS; NO. 12 CONTACTS - 35 AMPS.
     - (2) VOLTAGE RATING: 1500 VOLTS RMS AT SEA LEVEL.
     - (3) WITHSTANDING VOLTAGE: 1500 V RMS AT SEA LEVEL.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ − DECIMALS + ___ − ANGLES + ___ −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J Patterson DATE 1-JUL-65
CHECKED Fesler 10 NOV 65
APPROVAL R. Trummer 15 Nov 65
APPROVAL 1-21-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL M G Whaley 1-25-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
SQUARE FLANGE, BAYONET LOCKING
COUPLING, CRIMP TYPE PIN CONTACTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897305
SCALE NONE SHEET 1 of 2

MIL 1077C—P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS A RELEASE PER TDRR 25563		13-JAN-66	B.

REQUIREMENTS: (CONTINUED)

(4) CONTACT RESISTANCE (WHEN MEASURED FROM THE REAR OF THE PIN CONTACT CRIMP BARREL TO THE REAR OF THE SOCKET CONTACT CRIMP BARREL): NO. 16 CONTACTS - 22 MILLIVOLTS, MAX, AT 20 AMPERES; NO. 12 CONTACTS - 18 MILLIVOLTS, MAX, AT 35 AMPERES.

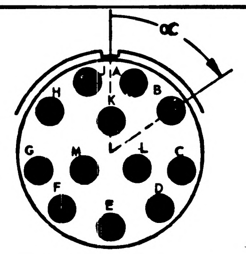
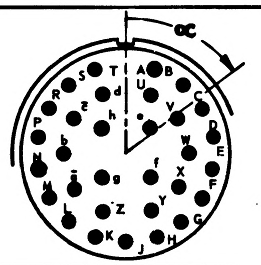
(5) OPERATING TEMPERATURE: +125°C, MAX.

(6) INSULATION RESISTANCE: 5000 MEGOHMS MIN, AT 25°C 50 MEGOHMS, MIN, AT 125°C.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. INSERT SHOWN IN NORMAL POSITION. FOR ALTERNATE POSITIONS, THE INSERT IS ROTATED $\propto$ DEGREES RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. FOR STRAIN RELIEF CLAMP SEE 1897315.
4. FOR SPARE CONTACTS SEE 1897346 OR 1897349 AS APPLICABLE; FOR SPARE SEALING PLUGS SEE 1010958.

TABLE I

NASA DASH NUMBER	NO. AND SIZE OF CONTACTS	$\propto$ IN DEGREES	DIMENSIONS								MAX ENG FORCE (IN-LBS)	MIN DIS-ENG FORCE (IN-LBS)	CONTACT ARRANGEMENT MATING FACE VIEW SEE NOTE	MANUFACTURER'S PART NUMBER (REF)
			A MAX	B	C	D	E	F	G MAX	H				
-001 -002 -003 -004	12 NO.12	0 20 70 169	1.453	1.161 1.151	1.251 1.245	1.187 1.157	.587 .556	.109 .079	1.250	.125 .115	36	6	 ∝ A B C D E F G H J K L M	22050-20-98P-311 22050-20-98PW-311 22050-20-98PX-311 22050-20-98PY-311
-006 -007 -008 -009	31 NO.16	0 46 74 122	1.703	1.380 1.370	1.501 1.495	1.453 1.423	.620 .589	.109 .079	1.328	.152 .142	38	7	 ∝ A B C D E F G H J K L M N P R S T U V W X Y Z a b c d e f g h	DTK00-24-31P-311 DTK00-24-31PW-311 DTK00-24-31PX-311 DTK00-24-31PY-311

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Patterson DATE 1-JUL-65
CHECKED Fesler 10 NOV 65
APPROVAL R. Trimmer 15 Nov 65
APPROVAL Ahrens 1-21-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL M C Munday 1-25-66

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
SQUARE FLANGE, BAYONET LOCKING
COUPLING, CRIMP TYPE PIN CONTACTS
SPECIFICATION CONTROL DRAWING

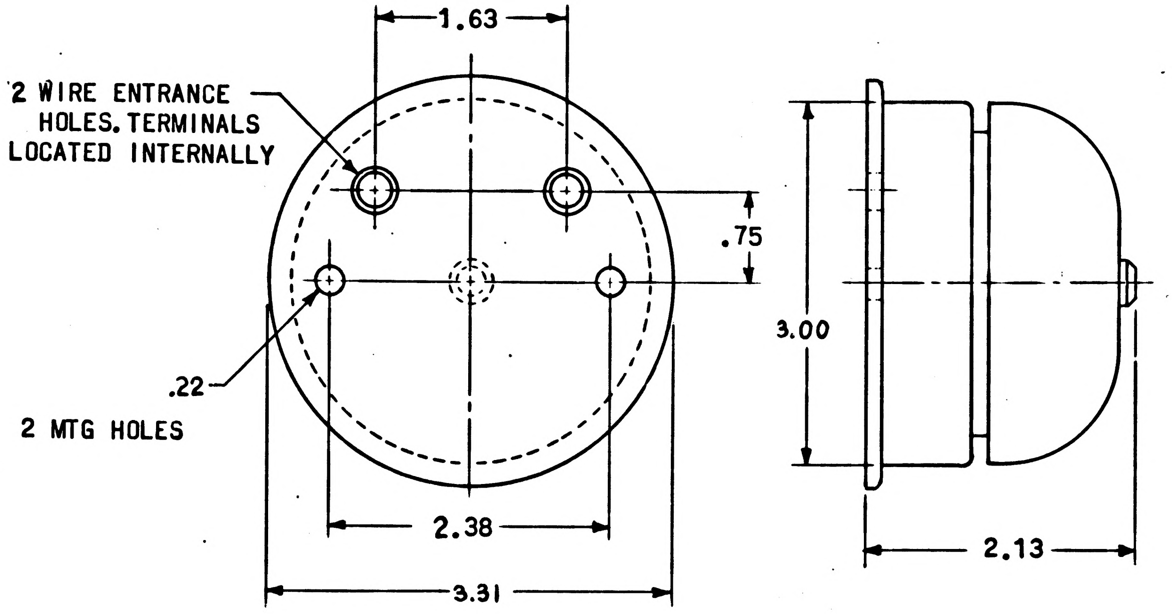
CODE IDENT NO. 99974
SIZE C
1897305
SCALE —
SHEET 2 of 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	C-4	REVISED PER MXC 205820		9 OCT 65	JWP
B		INITIAL RELEASE CLASS A PER TDRR 24042		10-18-65	WRC

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND THE NASA PART NUMBER.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) DIELECTRIC STRENGTH: PARTS SHALL BE ABLE TO WITHSTAND FOR ONE MINUTE WITHOUT DAMAGE 1000 VRMS, 60 CPS BETWEEN CURRENT CARRYING PARTS AND BASE.
     - (2) OPERATION: WHEN 24 VOLTS DC IS APPLIED THE BELL SHALL OPERATE.
3. DESIGN:
   - A. TYPE OF OPERATION: VIBRATING - LIGHT DUTY - NOT TO BE OPERATED CONTINUOUSLY FOR PERIODS EXCEEDING 30 MINUTES.
   - B. OUTPUT AT 10 FEET: 74 DB NOMINAL.
   - C. OPERATING VOLTAGE: 24 VDC NOMINAL.
   - D. OPERATING CURRENT: 0.4 AMPS NOMINAL.
   - E. INRUSH CURRENT: 0.6 AMPS NOMINAL.
   - F. WEIGHT: 3/4 POUNDS NOMINAL.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .02 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Crupx DATE 12 JUL 65
CHECKED Ed Foster 13 Jul 65
APPROVAL Bessenbine 14 Jul 65
APPROVAL L Jelliman 7/20/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELL, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897314
SCALE NONE
SHEET 1 OF 1

MIL 1077C—P

REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC / FC

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

NASA DASH NUMBER	FIG NO.	FOR USE WITH CONNECTOR SHELL SIZE	MANUFACTURER'S PART NUMBER (FOR REF)
-001	1	37	17541-37
-006	2	20	0029-040-263
-007	2	24	0029-107-263
-011	3	37	17063-37
-016	4	20	22013-20-263
-017	4	24	22013-24-263

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. DS STRAIGHT TYPE FIGURE 1.
2. DTK STRAIGHT TYPE FIGURE 2.
3. DS RIGHT-ANGLE TYPE FIGURE 3.
4. DTK RIGHT-ANGLE TYPE FIGURE 4.

39

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ − | DECIMALS + ___ − | ANGLES + ___ −
DO NOT SCALE THIS DRAWING
MATERIAL ______
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 13 JUL 65
CHECKED W. Diehl 15 Jul '65
APPROVAL R. Trummer 15 Jul '65
APPROVAL L. Johnson 10/21/65
NASA APPROVAL C. G. Metzger
MIT APPROVAL W. Koppe 21 Oct

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CLAMP, CABLE, ELECTRICAL CONNECTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	C	1897315
SCALE ___		SHEET 1 OF 1

MIL 1077C-F

1897316

REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC 204484		8 SEP 65	J.H.P. / E F
B		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC / Fe

REQUIREMENTS:

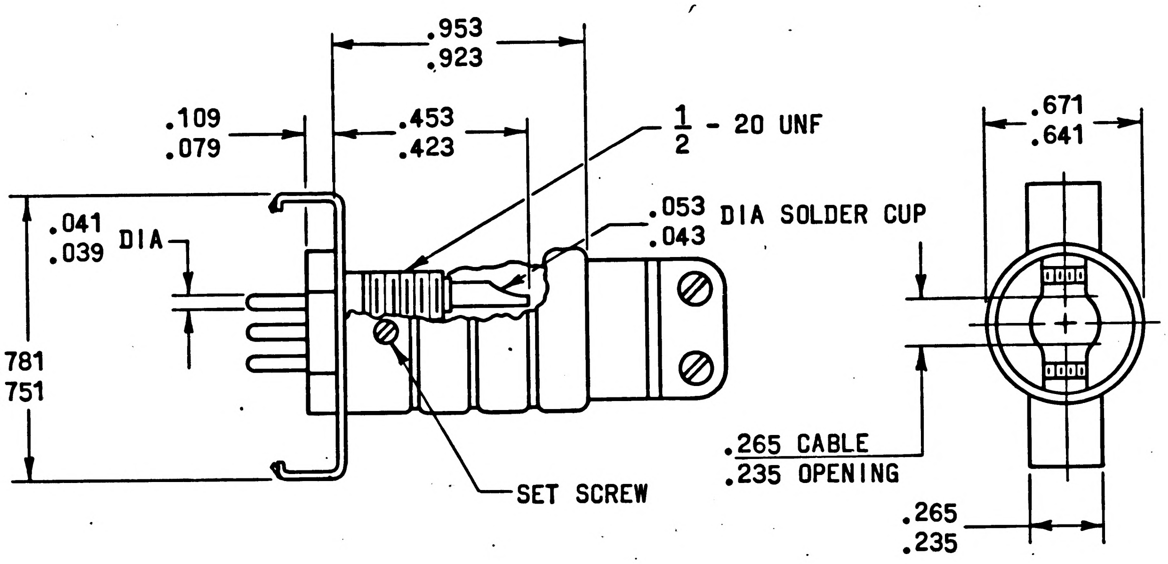
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-C-8384 UNLESS MODIFIED BY THIS DRAWING.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. MANUFACTURER'S PART NUMBER MAY APPEAR ON THE UNIT. UNITS TOO SMALL TO BE MARKED SHALL BE TAGGED OR BAGGED.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
   - A. MATERIALS AND FINISHES:
     - (1) BODY: MINERAL FILLED MELAMINE PER MIL-M-14
     - (2) CONTACTS: BRASS PER QQ-B-626, GOLD PLATED, .000030 MIN, PER MIL-G-45204, TYPE II, OVER COPPER FLASH.
     - (3) LOCKSPRING: PHOSPHOR BRONZE PER QQ-B-750, COMPOSITION A, SPRING TEMPER, CADMIUM PLATE PER QQ-P-416, TYPE 2, CLASS 3.
     - (4) HOOD: ANODIZED ALUMINUM.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 7.5 AMPS, MAX.
     - (2) INSULATION RESISTANCE: 1000 MEGOHMS MIN, AT 1000 VDC.
     - (3) DIELECTRIC STRENGTH: 1600 VRMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 20 MILLIVOLTS, MAX, AT 7.5 AMPS.

NOTES:

1. MATES WITH 1897317.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − DECIMALS + — − ANGLES + — −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Patterson DATE 14 JUL 65
CHECKED Ed Foster 19 JUL 65
APPROVAL R. TRUMMER 20 JUL 65
APPROVAL L Gediman 10/21/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
HEXAGONAL, SOLDER-TYPE PIN CONTACTS

SPECIFICATION CONTROL DRAWING

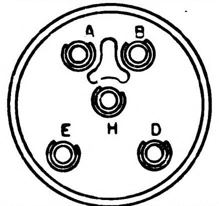
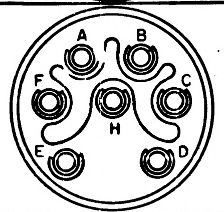
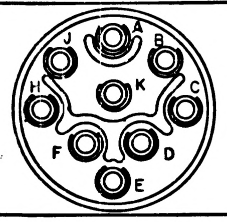
CODE IDENT NO. 99974 SIZE C 1897316
SCALE NONE SHEET 1 of 2

B 1897316 B

MIL 10770-P

REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISION STATUS CHANGED		8 SEP 65	J.H.P. EF
B		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC FE

TABLE I

NASA DASH NUMBER	NO. OF CONTACTS	CONTACT ARRANGEMENT TERMINAL VIEW (REF)	MANUFACTURER'S PART NUMBER (FOR REF)
-001	5		M5P-LSH16
-002	7		M7P-LSH16
-003	9		M9P-LSH16

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ___ ± ___ ± ___
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Petterson DATE 14 JUL 65
CHECKED Ed Foster 19 JUL 65
APPROVAL R. Trummer 20 JUL 65
APPROVAL L Gedunan 10/21/65
NASA APPROVAL J.C. Metzger
MIT APPROVAL W Kupfe 21 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL—
HEXAGONAL, SOLDER-TYPE PIN CONTACTS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897316
SCALE —
SHEET 2 of 2

MIL 1077C—P

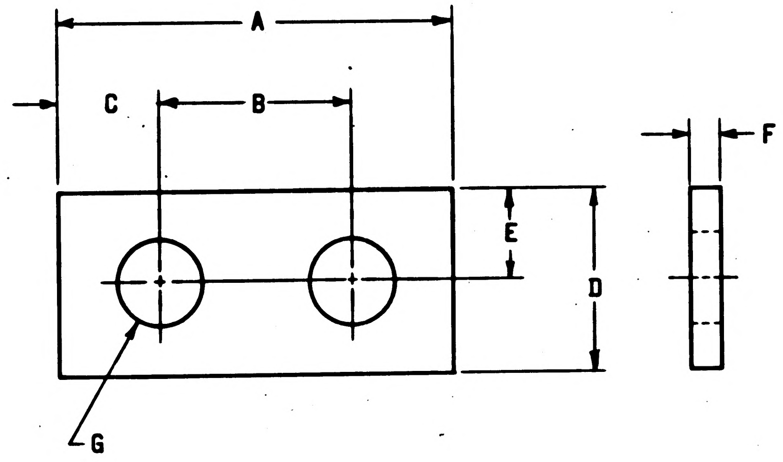
REVISIONS		23919			
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23919		19OCT 65	7E

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL: STAINLESS STEEL, CLASS 302 PER QQ-S-766.

NASA DASH NUMBER	DIMENSIONS							MANUFACTURER'S PART NUMBER (REF)
	A	B	C	D	E	F	G	
-001	.577 .547	.317 .307	.140 .110	.296 .266	.155 .125	.037 .027	.149 .139	600SP
-002	.890 .860	.505 .495	.202 .172	.421 .391	.218 .188	.037 .027	.194 .184	602SP

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM FOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + – DECIMALS + – ANGLES + –
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. Amyx DATE 16 JUL 65
CHECKED Wilson 2 Jul 65
APPROVAL W.H.Wilson Jr. 7 JUL 65
APPROVAL C Gelman 14/9/65
NASA APPROVAL J.C. Melzer
MIT APPROVAL W. Kupfer 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE, TERMINAL BOARD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897322
SCALE NONE
SHEET 1 OF 1

MIL 1077C—P

30

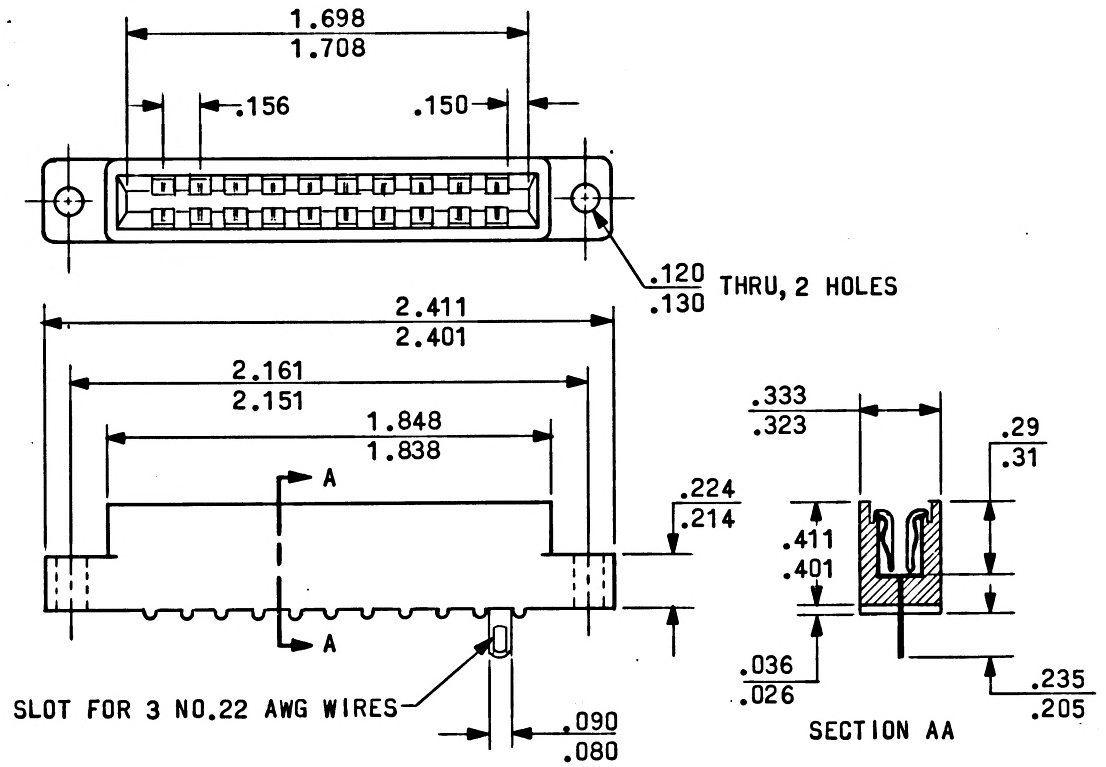
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	—	*REVISED PER MXC-205462*		7-OCT-65	B. / W.D
B	-	*REVISED PER MXC-206273*		21 OCT 65	GR / cw
C		INITIAL RELEASE CLASS A PER TDRR 23555		21 OCT 65	G.R / cw

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. PIECEMARKING: UNIT SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE UNIT.
   - B. PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
     - SUPPLIER'S NAME
     - NASA PART NUMBER
     - DATE CODE OR DATE OF MANUFACTURE
     - MANUFACTURER'S PART NUMBER (OPTIONAL)
   - C. CONTACT WITHDRAWAL FORCE: 1 OUNCE, MINIMUM, PER CONTACT WHEN TESTED PER MIL-C-21097, TYPE A, SIZE 2.

3. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) INSULATOR: DIALLYLPHTHALATE PER MIL-M-19833, COLOR-GREEN
       - (b) CONTACTS: BERYLLIUM COPPER
       - (c) POLARIZING KEY: COPPER ALLOY
     - (2) FINISH:
       - (a) CONTACTS: GOLD PLATE (.000030 MIN) OVER SILVER FLASH.
       - (b) POLARIZING KEY: GOLD PLATE OVER SILVER FLASH.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) CURRENT RATING: 5 AMP MAX.
     - (2) TEST VOLTAGE: 2500 VDC AT SEA LEVEL
     - (3) INSULATION RESISTANCE: 1000 MEGOHMS MIN AFTER HUMIDITY TEST PER MIL-C-21097.
     - (4) CONTACT RESISTANCE: 10 MILLIVOLTS, MAX, AT RATED CURRENT.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER'S LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 23 JUL 65
CHECKED W. Diehl 26 Jul 65 cw
APPROVAL R. TRUMMER 27 Jul 65
APPROVAL C Sperling 7/27
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
PRINTED CIRCUIT BOARD,
10 SOCKET CONTACTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897328
SCALE NONE
SHEET 1 of 2

MIL 1077C—P

cw

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	—	REVISION STATUS CHANGED		7-OCT-65	B. W.D.
B	-	REVISION STATUS CHANGED		21 OCT 65	GR cw
C		INITIAL RELEASE CLASS A PER TDRR 23555		21 OCT 65	GR cw

NASA DASH NUMBER	POLARIZING POSITION SEE NOTE 2	MANUFACTURER'S PART NUMBER (FOR REF)
-001	NONE	VH10/1AB5
-002	A	VH10/1AB5-A
-003	B	VH10/1AB5-B
-004	C	VH10/1AB5-C
-005	D	VH10/1AB5-D
-006	E	VH10/1AB5-E
-007	F	VH10/1AB5-F
-008	H	VH10/1AB5-H
-009	J	VH10/1AB5-J
-010	K	VH10/1AB5-K
-011	L	VH10/1AB5-L

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. CIRCUIT BOARD THICKNESS: .054 TO .071
2. POLARIZING KEY LOCATED IN CONTACT POSITION SPECIFIED IN LIEU OF CONTACT.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +___ −
DECIMALS +___ −
ANGLES +__ −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 23 JUL 65
CHECKED cw W. Stell 26 Jul '65
APPROVAL R. TRUMMER 27 JUL 65
APPROVAL C Sparling 10/27
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL—
PRINTED CIRCUIT BOARD,
10 SOCKET CONTACTS
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897328
SCALE —
SHEET 2 of 2

MIL 1077C—P

REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC-204993		21-SEP-65	B. EF
B		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	NRC AE

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

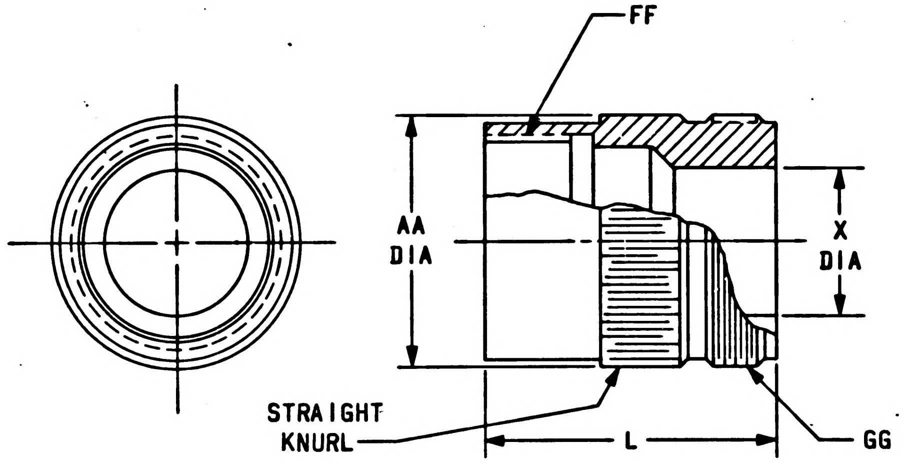
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING:
       - (a) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
       - (b) PACKAGE(S): SHALL BE MARKED PER MIL-STD-129, WITH THE SUPPLIER'S NAME AND NASA PART NUMBER.
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. MATERIAL AND FINISH: HIGH STRENGTH ALUMINUM ALLOY, ANODIZED OLIVE DRAB.

APPLICATION DATA:
FOR USE ON CLAMP 1897330.

DASH NUMBER	SHELL SIZE	AA DIA MAX	FF THREAD CLASS 2B	GG THREAD CLASS 2A	L	X DIA MIN	MANUFACTURER'S PART NUMBER FOR REF
-001	28	1.723	1-19/32 - 28NS	1-3/4 - 18NS	2.52 2.48	1.255	MA 28A1750

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN G. REICH DATE 28-JUL-65
CHECKED MALIKOWSKI 30-JUL-65
APPROVAL R. TRUMMER 30-JUL-65
APPROVAL L. Jodiman 10/21/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ADAPTER, CABLE CLAMP

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897331
SCALE FULL
SHEET 1 OF 1

MIL 1077C—P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	PT / TE

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - D. CONTACTS ARE TO BE PROCURED SEPARATELY. FOR CONTACTS SEE 1016369.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA PART NUMBER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.
       - (b) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER AND NASA PART NUMBER.

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH GUIDE PINS, GUIDE SOCKETS AND JACK SCREW INSERT: CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 METHOD E300.
   - B. ELECTRICAL PROPERTIES:
     - (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC
     - (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.
     - (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.
     - (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.
   - C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING
   - D. THIS CONNECTOR SHALL BE DESIGNED TO USE EITHER MALE OR FEMALE CONTACTS AS SHOWN ON 1016369.

DASH NUMBER	NO. OF CONTACT CAVITIES	MANUFACTURER'S PART NUMBER (REF)
-001	152	MB152R-4

THE PART NUMBER IS THE DRAWING NUMBER
PLUS THE APPLICABLE DASH NUMBER

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + – DECIMALS + – ANGLES + –
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Pillar DATE 5 AUG 65
CHECKED Ed Foster 6 AUG 65
APPROVAL R. Trummer 11 Aug 65
APPROVAL L Gehman 10/26/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 4 Nov 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

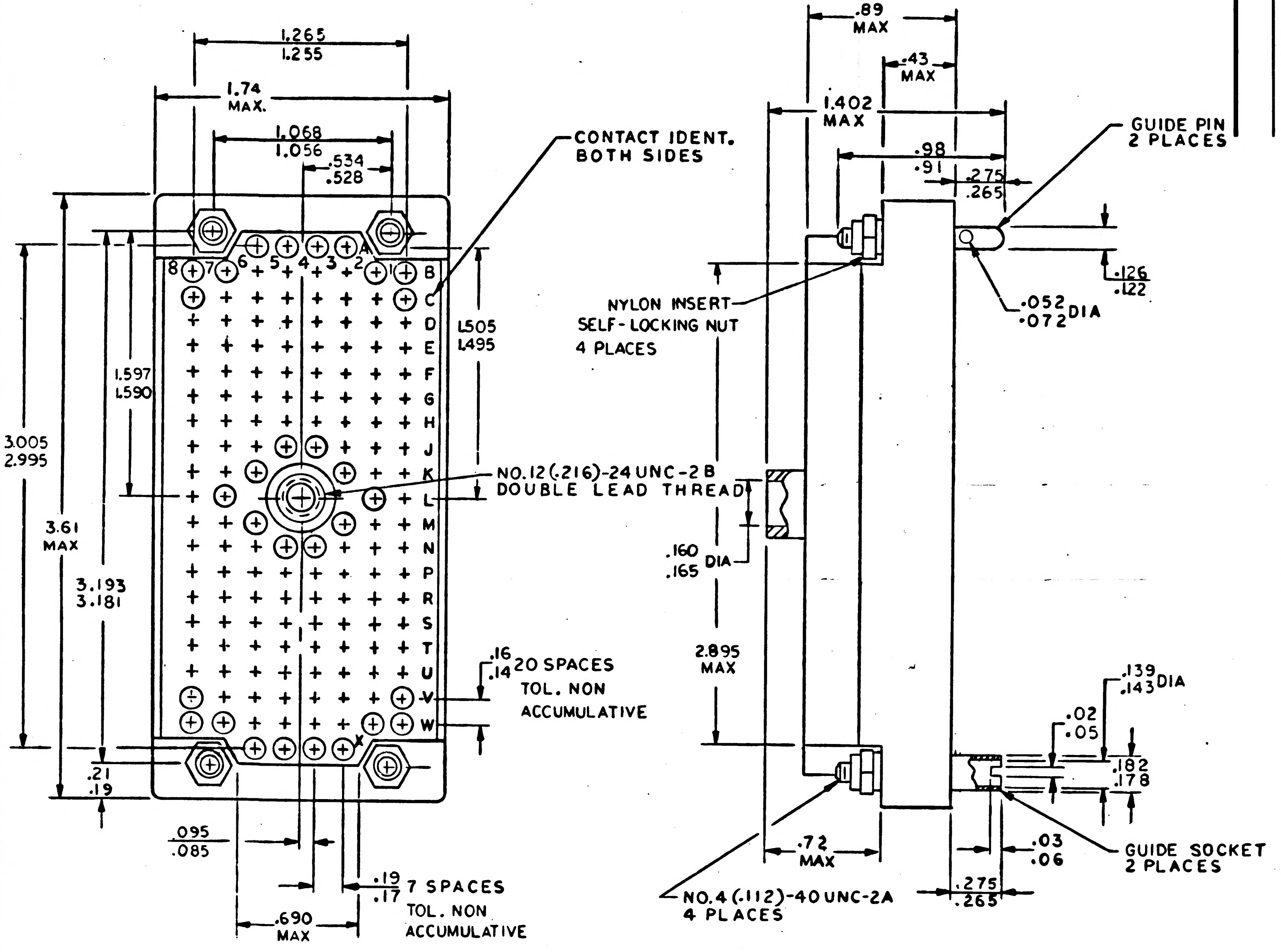
CONNECTOR, RECEPTACLE, ELECTRICAL - 152 CONTACTS

SPECIFICATION CONTROL DRAWING

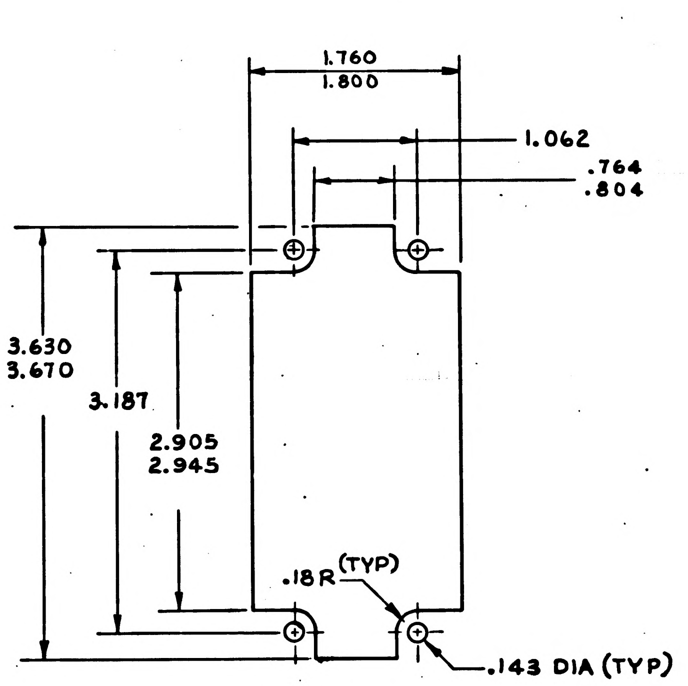
CODE IDENT NO. 99974
SIZE C
1897335
SCALE NONE
SHEET 1 OF 2

MIL 1077C—P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	PT



1.265
1.255
1.74 MAX.
1.068
1.056
.534
.528
CONTACT IDENT. BOTH SIDES
8 7 6 5 4 3 2 A 1
B C D E F G H J K L M N P R S T U V W
X
1.505
1.495
1.597
1.590
3.005
2.995
3.61 MAX
3.193
3.181
.21
.19
NO.12 (.216)-24 UNC-2B DOUBLE LEAD THREAD
.16
.14 20 SPACES TOL. NON ACCUMULATIVE
.095
.085
.19
.17 7 SPACES TOL. NON ACCUMULATIVE
.690 MAX
.89 MAX
.43 MAX
1.402 MAX
.98
.91
.275
.265
GUIDE PIN 2 PLACES
.126
.122
.052
.072 DIA
NYLON INSERT SELF-LOCKING NUT 4 PLACES
.160
.165 DIA
2.895 MAX
.139
.143 DIA
.02
.05
.182
.178
.03
.06
GUIDE SOCKET 2 PLACES
.72 MAX
.275
.265
NO.4 (.112)-40 UNC-2A 4 PLACES



1.760
1.800
1.062
.764
.804
3.630
3.670
3.187
2.905
2.945
.18R (TYP)
.143 DIA (TYP)

MOUNTING OPENING
(FOR REFERENCE)

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS		
		FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___	ACSP PN			
			DRAWN R. Pillar DATE 5 AUG 65	CONNECTOR, RECEPTACLE, ELECTRICAL - 152 CONTACTS		
			CHECKED Ed Foster 6 Aug 65			
			APPROVAL R. Trummer 11 Aug 65			
		DO NOT SCALE THIS DRAWING	APPROVAL	SPECIFICATION CONTROL DRAWING		
		MATERIAL SEE REQUIREMENTS	NASA APPROVAL A. C. METZGER	CODE IDENT NO. 99974	SIZE C	1897335
NEXT ASSY	USED ON					
APPLICATION		CONTRACT NAS 9-497	MIT APPROVAL	SCALE NONE		SHEET 2 OF 2

MIL 1077C-P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	PT / FE
B		REVISED PER TDRR26722		7 MAR 66	OKD / J.E.G.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN MIL-Q-9858.
   - D. CONTACTS ARE TO BE PROCURED SEPARATELY. FOR CONTACTS SEE 1016369.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA PART NUMBER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.
       - (b) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER AND NASA PART NUMBER.

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH GUIDE PINS, GUIDE SOCKETS AND JACK SCREW INSERT: CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072 METHOD E300.
   - B. ELECTRICAL PROPERTIES:
     - (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC
     - (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.
     - (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.
     - (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.
   - C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING
   - D. THIS CONNECTOR SHALL BE DESIGNED TO USE EITHER MALE OR FEMALE CONTACTS AS SHOWN ON 1016369.

DASH NO.	NO. OF CONTACT CAVITIES	GUIDE PIN (X) & SOCKET (0) ORIENTATION (TERMINAL VIEW)	MFG. P/N (REF.)
-001	152	X X (A-1) 0 0	MB 152 R-8
-002	152	X 0 (A-1) X 0	MB 152 R-14
-003	152	X X (A-1) 0 X	MB 152 R-15

THE PART NUMBER IS THE DRAWING NUMBER
PLUS THE APPLICABLE DASH NUMBER

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Pillar DATE 5 AUG 65
CHECKED Ed Foster 6 AUG 65
APPROVAL 11 Aug 65
APPROVAL 10/26/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 24 Nov 65

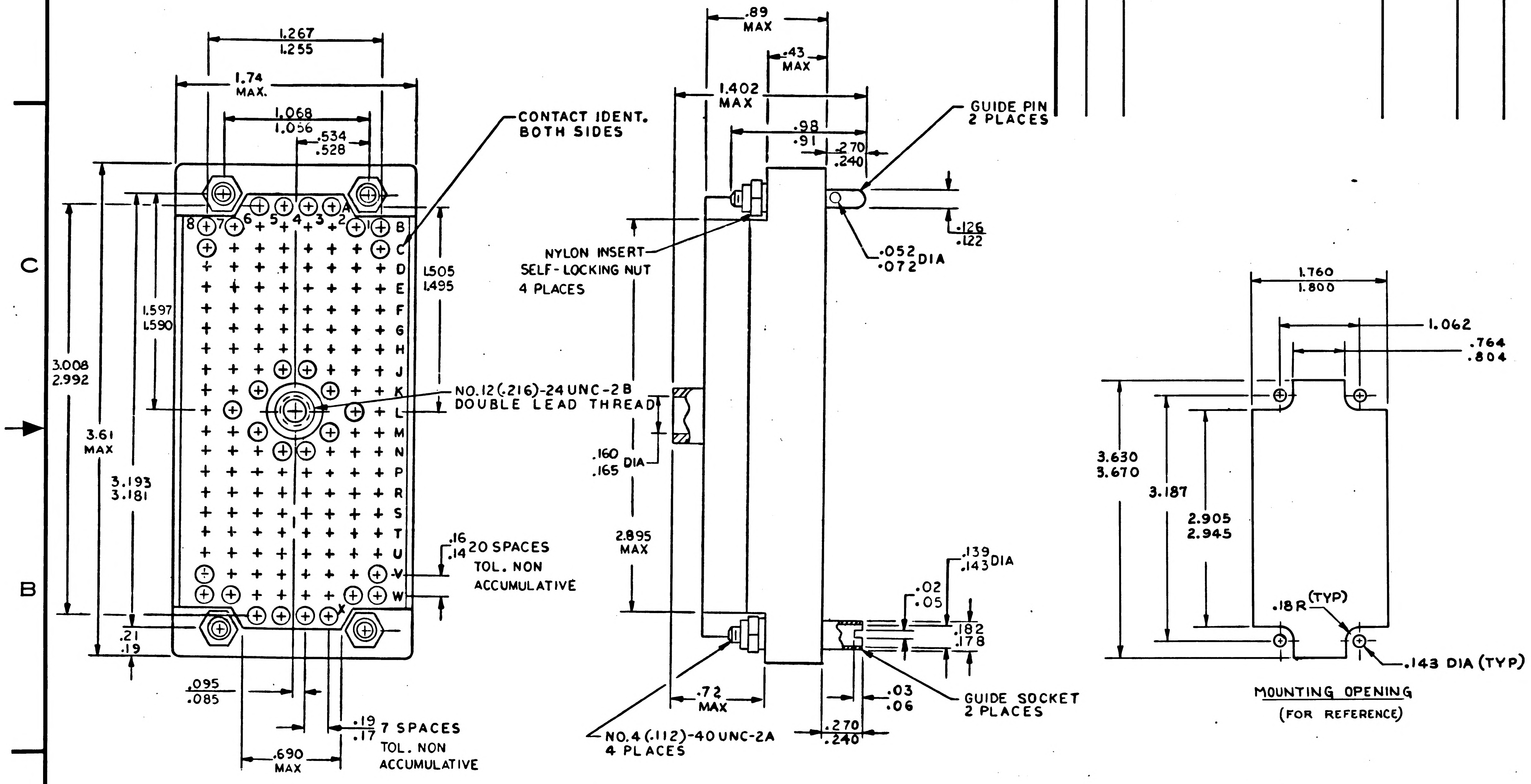
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL -
152 CONTACTS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897335
SCALE NONE
SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	PT TE
B		REVISED PER TDRR 26722		7 MAR 66	DHD J.E.G.



1.267
1.255
1.74 MAX.
1.068
1.056
.534
.528
CONTACT IDENT. BOTH SIDES
A 2 3 4 5 6 7 8
B C D E F G H J K L M N P R S T U V W
X
1.505
1.495
1.597
1.590
3.008
2.992
3.61 MAX
3.193
3.181
NO. 12 (.216)-24 UNC-2B DOUBLE LEAD THREAD
.16
.14
20 SPACES TOL. NON ACCUMULATIVE
.21
.19
.095
.085
.19
.17
7 SPACES TOL. NON ACCUMULATIVE
.690 MAX
.89 MAX
.43 MAX
1.402 MAX
.98
.91
.270
.240
GUIDE PIN 2 PLACES
.126
.122
.052
.072 DIA
NYLON INSERT SELF-LOCKING NUT 4 PLACES
.160
.165 DIA
2.895 MAX
.139
.143 DIA
.02
.05
.182
.178
.72 MAX
.03
.06
GUIDE SOCKET 2 PLACES
.270
.240
NO. 4 (.112)-40 UNC-2A 4 PLACES
1.760
1.800
1.062
.764
.804
3.630
3.670
3.187
2.905
2.945
.18R (TYP)
.143 DIA (TYP)
MOUNTING OPENING (FOR REFERENCE)

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
		DO NOT SCALE THIS DRAWING	DRAWN R. Gillar DATE 5 AUG 65 CHECKED Ed Foster 6 Aug 65 APPROVAL L. Trummer 11 Aug 65 APPROVAL L. Gilman 9 Aug 65	CONNECTOR, RECEPTACLE, ELECTRICAL - 152 CONTACTS SPECIFICATION CONTROL DRAWING	
NEXT ASSY	USED ON	MATERIAL SEE REQUIREMENTS	NASA APPROVAL A. C. METZGER MIT APPROVAL W Kyle for 4 Nov 65	CODE IDENT NO. 99974	SIZE C
APPLICATION		CONTRACT NAS 9-497		SCALE NONE	1897335 SHEET 2 OF 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	PT / TE

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - D. CONTACTS ARE TO BE PROCURED SEPARATELY. FOR CONTACTS SEE 1016369.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
     - (1) MARKING:
       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA PART NUMBER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.
       - (b) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER AND NASA PART NUMBER.

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH GUIDE PINS, GUIDE SOCKETS AND JACK SCREW: CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072, METHOD E300. THE JACKSCREW THREADS SHALL BE CLASS 324 CRES.
   - B. ELECTRICAL PROPERTIES:
     - (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC
     - (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.
     - (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.
     - (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.
   - C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING
   - D. THIS CONNECTOR SHALL BE DESIGNED TO USE EITHER MALE OR FEMALE CONTACTS AS SHOWN ON 1016369.

DASH NUMBER	NO. OF CONTACT CAVITIES	MANUFACTURER'S PART NUMBER (REF)
-001	152	MB152P-4

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ − DECIMALS + ___ − ANGLES + ___ −
DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 5 AUG 65
CHECKED Ed Foster 6 AUG 65
APPROVAL R. Trummer 11 AUG 65
APPROVAL L Jediman 10/26/65
A. C. METAGE
NASA APPROVAL
MIT APPROVAL 4 Nov 65

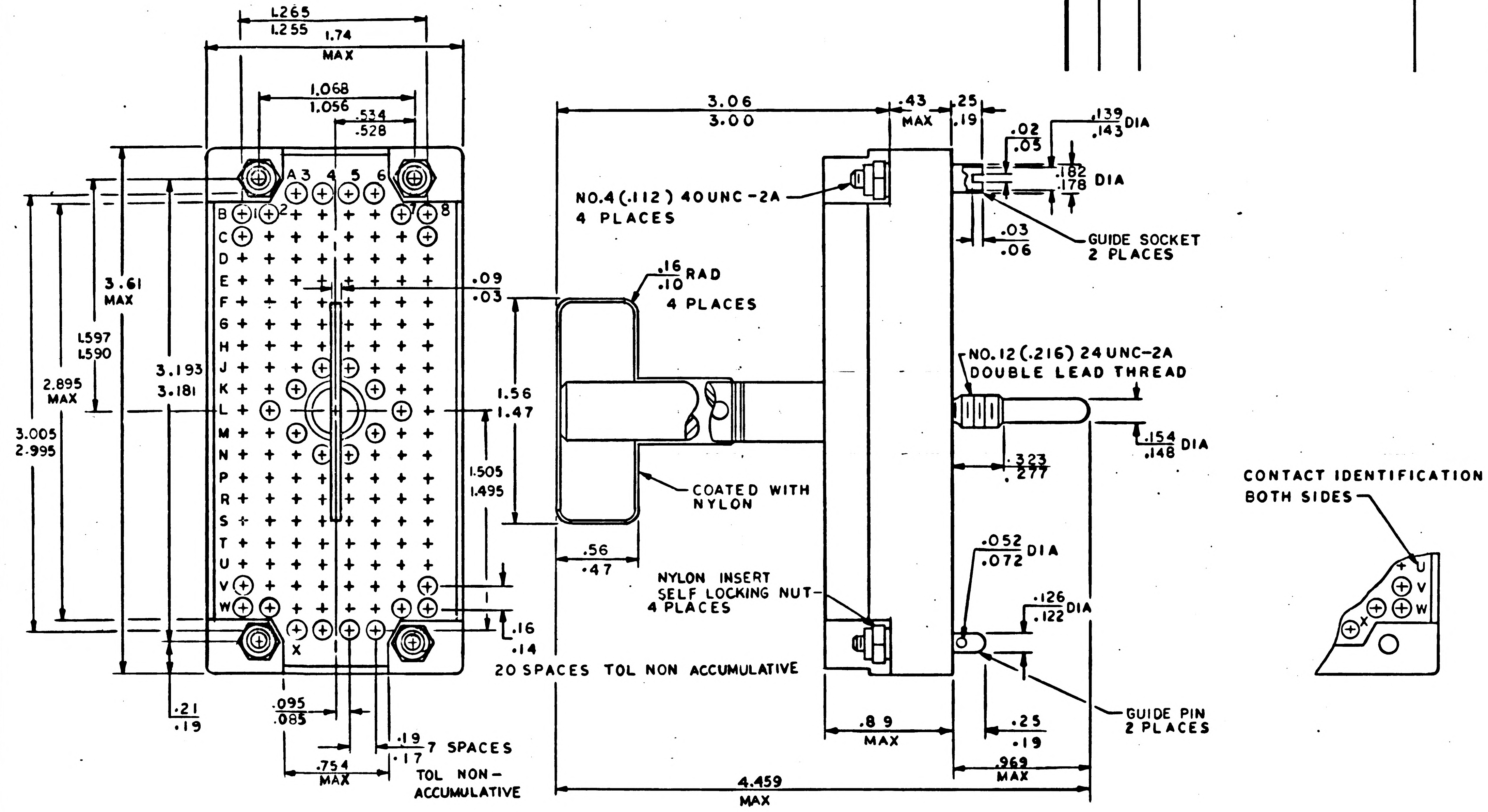
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
152 CONTACTS

SPECIFICATION CONTROL DRAWINGS

CODE IDENT NO. 99974
SIZE C
1897336
SCALE NONE
SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	



1.265
1.255
1.74 MAX
1.068
1.056
.534
.528
A 3 4 5 6
B 1 2 7 8
C D E F G H J K L M N P R S T U V W X
3.61 MAX
1.597
1.590
2.895 MAX
3.193
3.181
3.005
2.995
.09
.03
1.56
1.47
1.505
1.495
.16
.14
20 SPACES TOL NON ACCUMULATIVE
.21
.19
.095
.085
.19
.17
7 SPACES TOL NON-ACCUMULATIVE
.754 MAX
3.06
3.00
.43 MAX
.25
.19
NO.4 (.112) 40 UNC-2A 4 PLACES
.16
.10 RAD 4 PLACES
.02
.05
.139
.143 DIA
.182
.178 DIA
.03
.06
GUIDE SOCKET 2 PLACES
NO.12 (.216) 24 UNC-2A DOUBLE LEAD THREAD
.154
.148 DIA
.323
.277
COATED WITH NYLON
.56
.47
NYLON INSERT SELF LOCKING NUT 4 PLACES
.052
.072 DIA
.126
.122 DIA
GUIDE PIN 2 PLACES
.89 MAX
.25
.19
.969 MAX
4.459 MAX
CONTACT IDENTIFICATION BOTH SIDES
U V W X

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 6 AUG 65
CHECKED Ed Foster 6 Aug 65
APPROVAL R. Trummer 11 Aug 65
APPROVAL 10/26/65
NASA APPROVAL A. G. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
152 CONTACTS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897336
SCALE NONE
SHEET 2 OF 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	PT FE
B		REVISED PER TDRR 26723		4 MAR 66	FE J.E.G.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL MEET THE GENERAL REQUIREMENTS OF MIL-C-8384 WITH EXCEPTIONS AND ADDITIONS AS NOTED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO MIL-Q-9858.
   - D. CONTACTS ARE TO BE PROCURED SEPARATELY. FOR CONTACTS SEE 1016369.

2. ACCEPTANCE AND INSPECTION:
   - A. MECHANICAL PROPERTIES:
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       - (a) UNITS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-130 WITH THE NASA PART NUMBER. TERMINAL IDENTIFICATION SHALL BE SILK SCREENED OR MOLDED ON THE BODY OF EACH UNIT ON BOTH SIDES.
       - (b) INDIVIDUAL OR COLLECTIVE PACKAGING SHALL BE MARKED BOTH INTERNALLY AND EXTERNALLY IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER AND NASA PART NUMBER.

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: GLASS FILLED PHENOLIC PER MIL-M-14, TYPE MFH GUIDE PINS, GUIDE SOCKETS AND JACK SCREW: CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303, CONDITION A, PASSIVATED PER MIL-F-14072, METHOD E300. THE JACKSCREW THREADS SHALL BE CLASS 324 CRES OR AMS 5643.
   - B. ELECTRICAL PROPERTIES:
     - (1) OPERATING VOLTAGE RATINGS (SEA LEVEL): 840 VDC
600 VAC
     - (2) TEST VOLTAGE: 1800 VOLTS RMS AT SEA LEVEL.
     - (3) CURRENT RATING: 7.5 AMPERES MAXIMUM.
     - (4) INSULATION RESISTANCE: 1000 MEGOHMS, MINIMUM.
   - C. THIS CONNECTOR SHALL BE DESIGNED TO MATE WITH CONNECTOR PER NASA DRAWING
   - D. THIS CONNECTOR SHALL BE DESIGNED TO USE EITHER MALE OR FEMALE CONTACTS AS SHOWN ON 1016369.

DASH NUMBER	NO. OF CONTACT CAVITIES	GUIDE PIN (X) & SOCKET (0) ORIENTATION (TERMINAL VIEW)	MANUFACTURER'S PART NO. (REF)
001	152	0 0 (A-7) X X	MB 152P-9
002	152	X 0 (A-7) X 0	MB 152P-14
003	152	0 0 (A-7) 0 X	MB 152P-15

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ____ − DECIMALS + ____ − ANGLES + ____ −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 5 AUG 65
CHECKED Ed Foster 6 AUG 65
APPROVAL R. Trummer 11 AUG 65
APPROVAL L. Zelman 9/26/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

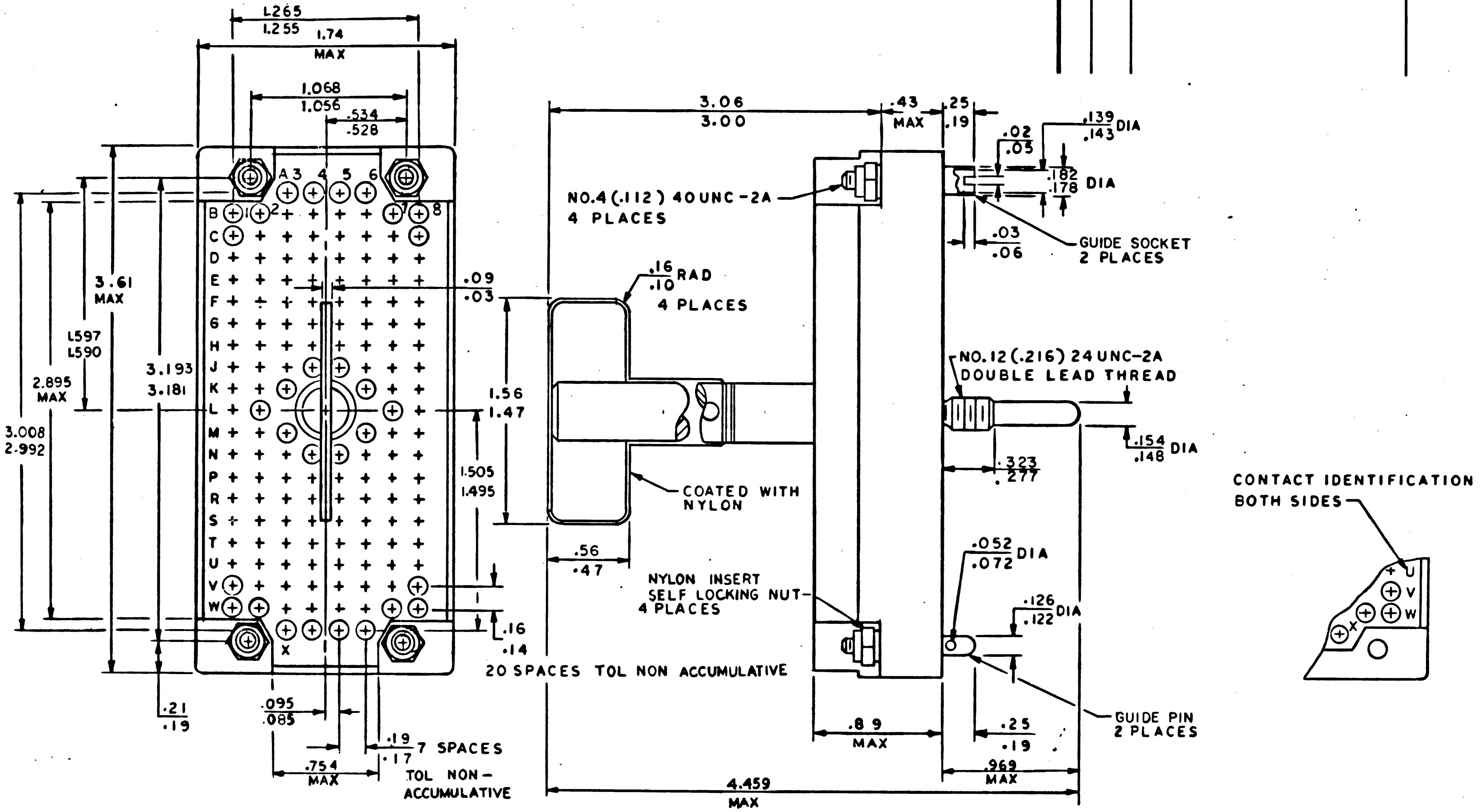
CONNECTOR, PLUG, ELECTRICAL -
152 CONTACTS

SPECIFICATION CONTROL DRAWINGS

CODE IDENT NO. 99974
SIZE C
1897336
SCALE NONE
SHEET 1 OF 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		INITIAL RELEASE CLASS A PER TDRR 23807		18 OCT 65	
B		REVISED PER TORR 26723		4 MAR 66	J.E.G



1.265
1.255
1.74 MAX
1.068
1.056
.534
.528
A 3 4 5 6
B 1 2 8
C D E F G H J K L M N P R S T U V W X
3.61 MAX
1.597
1.590
2.895 MAX
3.193
3.181
3.008
2.992
.09
.03
1.56
1.47
1.505
1.495
.16
.14
20 SPACES TOL NON ACCUMULATIVE
.21
.19
.095
.085
.19
.17
7 SPACES
.754 MAX
TOL NON-ACCUMULATIVE
3.06
3.00
.43 MAX
.25
.19
.02
.05
.139
.143 DIA
.182
.178 DIA
NO.4 (.112) 40 UNC-2A
4 PLACES
.16
.10 RAD
4 PLACES
.03
.06
GUIDE SOCKET
2 PLACES
NO.12 (.216) 24 UNC-2A
DOUBLE LEAD THREAD
.154
.148 DIA
.323
.277
COATED WITH NYLON
.56
.47
.052
.072 DIA
NYLON INSERT
SELF LOCKING NUT
4 PLACES
.126
.122 DIA
GUIDE PIN
2 PLACES
.89 MAX
.25
.19
.969 MAX
4.459 MAX
CONTACT IDENTIFICATION
BOTH SIDES
U V W X

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ − DECIMALS + ___ − ANGLES + ___ −
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 6 AUG 65
CHECKED Ed Foster 6 Aug 65
APPROVAL R. Trummer 11 Aug 65
APPROVAL 10/26/65
NASA APPROVAL A. G. METZGER
MIT APPROVAL 4 Nov 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL -
152 CONTACTS

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897336
SCALE NONE
SHEET 2 OF 2

MIL 1077C-P

NOTICE: WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS 23416			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW

ASSEMBLY AND MOUNTING INSTRUCTIONS

RECOMMENDED PANEL CUT-OUTS ARE SHOWN IN FIGURE 8.

DISASSEMBLY OF LIGHT

1. USING FINGERNAIL SLOTS ON SIDES, PULL LENS ASSEMBLY OUT APPROXIMATELY 5/8".
2. ROTATE LENS ASSEMBLY 90°. (SEE FIGURE A)
3. PUSH LENS IN TO RELEASE TENSION ON INDEX KEYS AND THEN PULL COMPLETE ASSEMBLY OUT.
4. BULBS, COLORED BOOTS, LENS AND LEGENDS MAY NOW BE REMOVED SEPARATELY AS SHOWN IN FIGURE B.
5. SWITCH ASSEMBLY MAY BE REMOVED BY SIMPLY RELEASING SPRING CLIPS AS SHOWN IN FIGURE B.

INSTALLATION OF LIGHT

6. TO INSTALL LIGHT IN PANEL FIRST PERFORM STEPS 1, 2, AND 3 OF DISASSEMBLY OF LIGHT.
7. UNSCREW (2) SCREWS UNTIL THE CAPTIVE NUTS REACH THE REAR OF THEIR TRAVEL RANGE (SHOWN IN FIGURE C) AND REMOVE COVER.
8. INSERT LIGHT THROUGH PANEL CUTOUT FROM THE FRONT OF PANEL AS SHOWN IN FIGURE D.
9. FROM REAR OF PANEL, SLIP COVER OVER LIGHT UNTIL IT FITS SNUGLY AGAINST REAR OF PANEL.

   A. IF MOUNTING PANEL THICKNESS IS APPROX .125 OR LESS, COVER IS INSTALLED AS SHOWN IN FIGURE D: IF PANEL THICKNESS IS GREATER THAN .125 INSTALL COVER WITH OPPOSITE END FIRST.

10. TIGHTEN THE TWO SCREWS FROM FRONT OF PANEL.
11. INSERT COMPLETE FRONT END ASSEMBLY SO THAT BULB BOARD SLOT ALIGNS WITH BULBBOARD INDEX.
12. ROTATE LENS ASSEMBLY 90° SO THAT LENS AND LEGEND INDEX IS AT TOP OF LIGHT.
13. PUSH ASSEMBLY INTO LIGHT TO COMPLETE INSTALLATION.

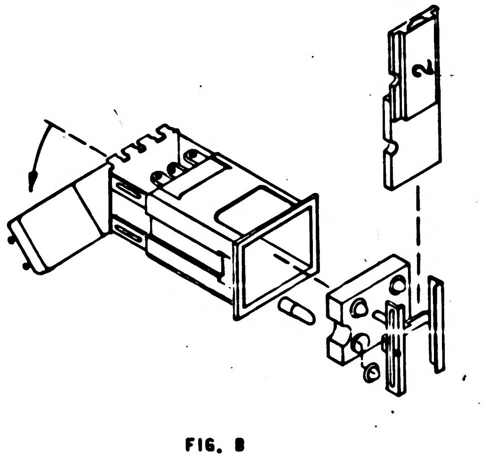


FIG. B

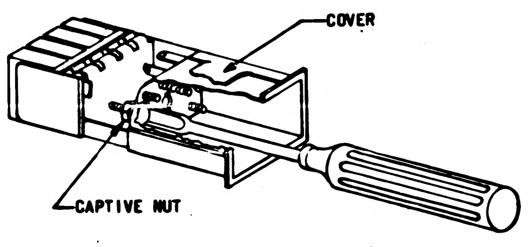


FIG. C

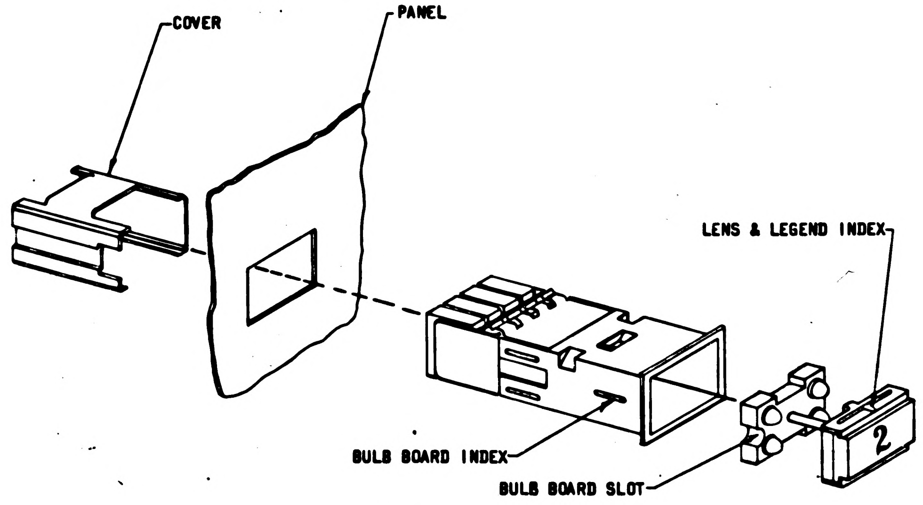


FIG. D

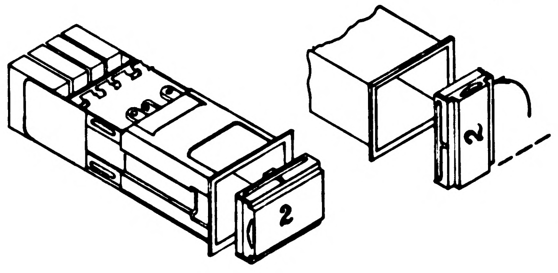


FIG. A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± .010 ANGLES ± 1/2° DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE MASS CONTRACT NAS9 DRAWN J. Petterson DATE CHECKED Ed Foster 29 Jul 65 APPROVAL 11 Aug 65 APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS LIGHT - INDICATOR AND LIGHT - INDICATOR SWITCH ASSEMBLY SPECIFICATION CONTROL DRAWING
APPLICATION		MATERIAL SEE REQUIREMENTS	NASA APPROVAL MIT APPROVAL	CODE IDENT NO. 99974 SIZE D 1897337 SCALE — WT SHEET 7 OF 9

1897337 C

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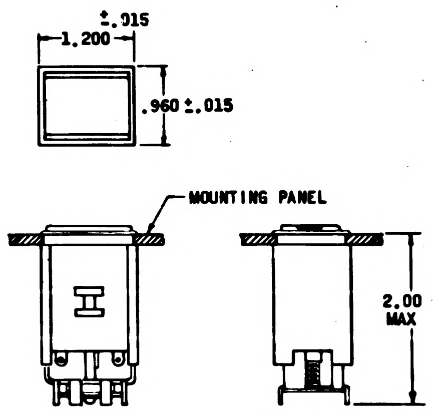
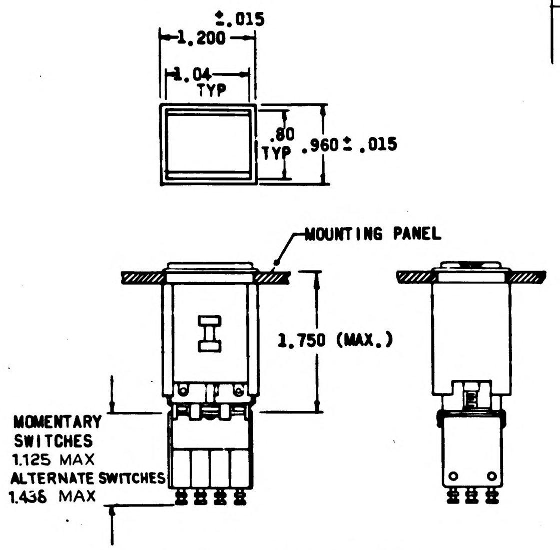
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINALS: SHALL ACCOMMODATE TWO(2) NUMBER 20 GAGE WIRES. SWITCH TERMINALS SHALL BE THE DOUBLE-TURRET TYPE, AND LAMP TERMINALS SHALL BE OF THE PIERCED SPADE TYPE. TERMINALS SHALL BE SUITABLE FOR SOLDERING.
     - (2) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - a. MANUFACTURER'S NAME OR SYMBOL
       - b. MANUFACTURER'S ASSEMBLY PART NUMBER
       - c. LAMP CIRCUIT DIAGRAM
       - d. SWITCH CALL-OUT (1,2,ETC.)(FIGURE II)
       - e. TERMINAL NUMBERING (FIGURE II)
         NC, C, NO FOR SWITCHES
         A, B, C, D, G, FOR LAMPS
     - (3) PHYSICAL CAPTIVITY: LAMP AND LENS ASSEMBLY SHALL BE PHYSICALLY CAPTIVE BY MEANS OF A FLEXIBLE HINGE ASSEMBLY.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) SWITCHING ACTION: PER TABLE 1 THRU 5 AND FIGURE 1 THRU 4 AND TABLE C.
     - (2) COLOR BACKGROUND: PER TABLE 1 AND FIGURE 10
     - (3) DIELECTRIC STRENGTH:
       UNIT SHALL WITHSTAND 1000 VRMS 60 CPS APPLIED FOR ONE MINUTE BETWEEN MUTUALLY INSULATED PARTS, AND INSULATED PARTS AND GROUND. THERE SHALL BE NO EVIDENCE OF ARCING, BREAKDOWN OR DAMAGE.
     - (4) INSULATION RESISTANCE:
       SHALL BE 100 MEGOHMS MINIMUM WHEN MEASURED WITH 100 VDC BETWEEN ALL MUTUALLY INSULATED POINTS

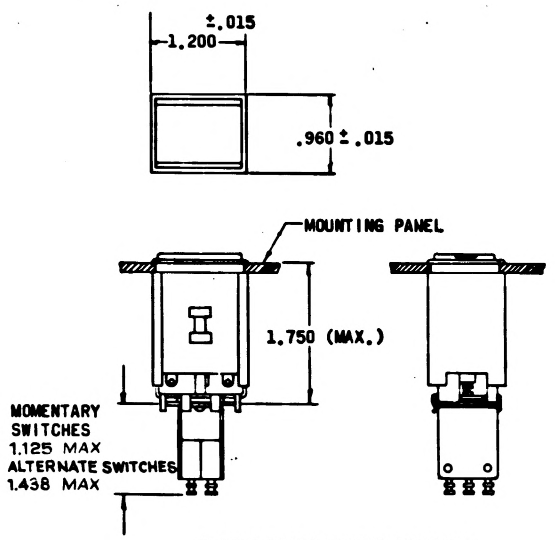


INDICATOR
FIGURE 1

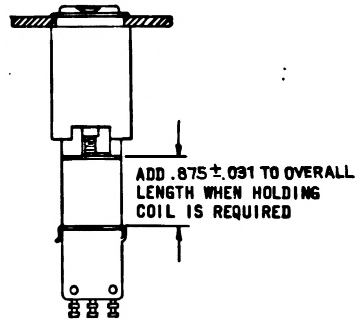


4 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 3

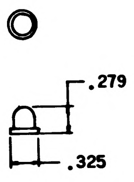
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	65	
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 3416	18 OCT 65	REW



2 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 2


ADD .875±.031 TO OVERALL LENGTH WHEN HOLDING COIL IS REQUIRED

HOLDING COIL ADDITION
FIGURE 4.



COLORED BULB BOOT
FIGURE 5

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS

NEXT ASSY	USED ON

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DRAWN J. Patterson DATE 29 JUL 65
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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO	SIZE	NASA DRAWING NO
99974	D	1897337
SCALE ——	WT	SHEET 2 OF 9

1897337 C

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3. DESIGN REQUIREMENTS:

A. SWITCH CONTACTS: SHALL BE FINE SILVER, SILVER ALLOY OR SILVER PLATED BRASS.

B. SWITCH CONTACT RATING:

RATED LOAD	30V DC	125/250V AC
RESISTIVE	5.0 AMPS	5.0 AMPS
INDUCTIVE	3.0 AMPS	5.0 AMPS

C. FRONT LENS STYLE: PER TABLE 1 THRU 5 AND FIGURE 6 AND TABLE 8.

D. LEGEND: SHALL BE .120 HIGH WITH .015 STROKE WIDTH. LETTERS AS SPECIFIED IN TABLE SHALL BE REVERSE ENGRAVED ON BACK SIDE OF LENS AND THEN FILLED WITH BLACK INK. EACH LINE OF LETTERS SHALL BE CENTERED ON THE LENS.

E. LAMPS: THIS UNIT SHALL BE SUPPLIED WITH MS-25237-327 LAMPS, FOUR (4) PER UNIT, UNLESS OTHERWISE STATED IN TABLE 1 THRU TABLE 5.

F. GROUND CIRCUIT: SHALL BE SINGLE GROUND UNLESS OTHERWISE NOTED AS ISOLATED DUAL GROUNDS.

G. BOOT: SHALL BE AS SHOWN IN FIGURE 5 AND REFERENCED IN TABLE A AND TABLE 1 THRU 5.

H. MOUNTING COVER: SHALL BE AS SHOWN IN FIGURE 7. (SEE ALSO ASSEMBLY & MOUNTING)

J. INDICATOR CLIP: SHALL BE POSITIONED ON THE SHAFT AS SHOWN IN FIGURE 9. (INDICATOR ONLY - TABLE 1)

K. MAGNETIC HOLDING COIL: MAGNETIC HOLDING COIL IS AVAILABLE AT 28 VDC ON ALL MOMENTARY ACTION MODELS. SEE FIGURE 4.

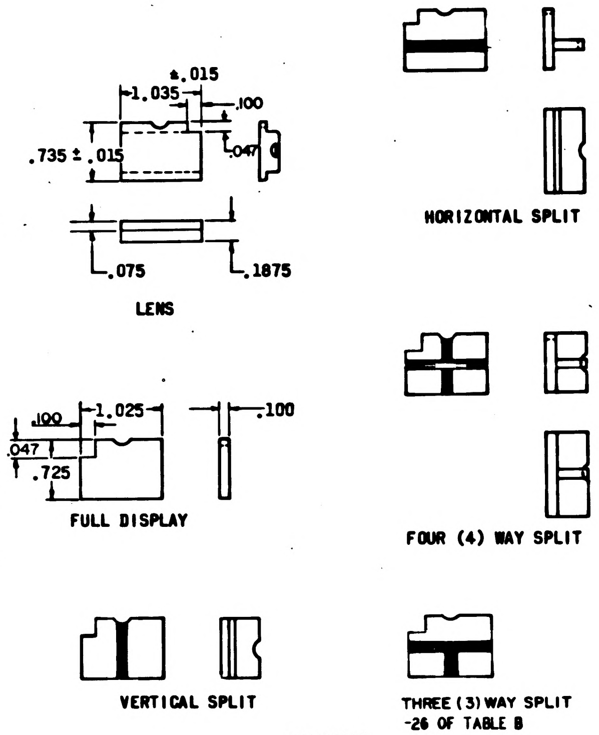
(1) HOLDING COIL RESISTANCE: 435 OHMS ±10%, AT +25°C
(2) HOLD-IN VOLTAGE: 18 VOLTS DC MINIMUM AT +25°C.
(3) MAXIMUM OVERLOAD VOLTAGE: 32 VOLTS DC.

L. LIFE: 25,000 OPERATIONS MINIMUM AT RATED LOAD.

M. ENVIRONMENTAL REQUIREMENTS:

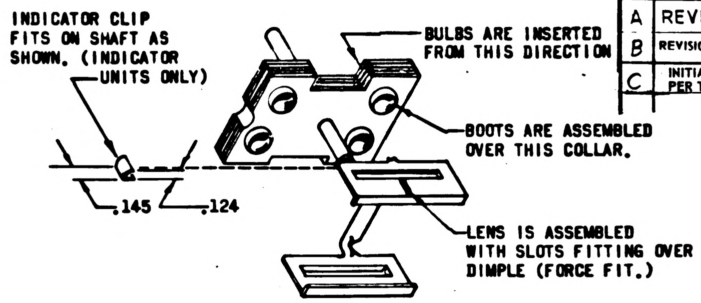
THESE UNITS SHALL MEET ALL THE FUNCTIONAL REQUIREMENTS, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTS WHEN TESTED PER THE PROCEDURES OF MIL-E-5272.

(1) VIBRATION: 10 TO 500 CPS, 10 G.
(2) SHOCK: 20 G FOR 10 MILLISECONDS
(3) TEMPERATURE: 71°C MAX. FOR 48 HOURS WITH ALL 4 LAMPS ILLUMINATED.

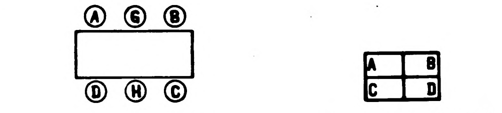

±.015
1.035
.100
.735 ± .015
.047
.075
.1875
LENS
.100
1.025
.047
.725
.100
FULL DISPLAY
VERTICAL SPLIT
HORIZONTAL SPLIT
FOUR (4) WAY SPLIT
THREE (3) WAY SPLIT
-26 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6


INDICATOR CLIP FITS ON SHAFT AS SHOWN. (INDICATOR UNITS ONLY)
BULBS ARE INSERTED FROM THIS DIRECTION
BOOTS ARE ASSEMBLED OVER THIS COLLAR.
LENS IS ASSEMBLED WITH SLOTS FITTING OVER DIMPLE (FORCE FIT.)
.145
.124

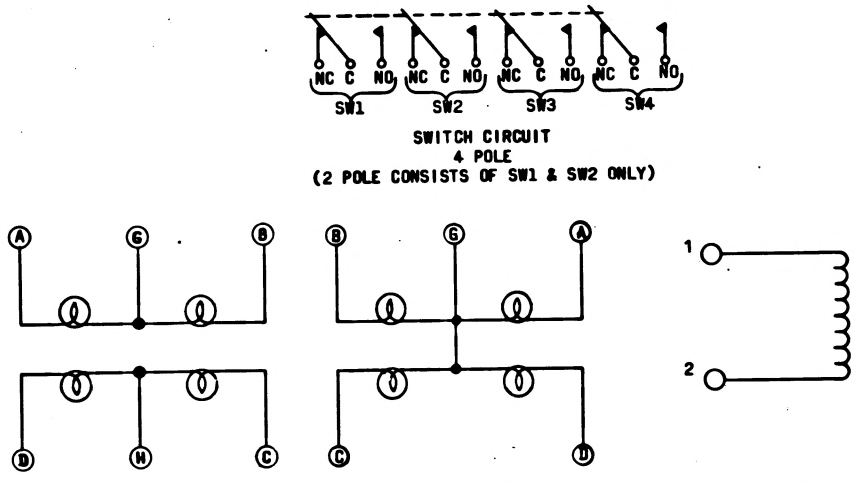
LAMP MODULE ASSEMBLY
FIGURE 9



LAMP TERMINALS
(TERMINAL H DOES NOT APPEAR ON SINGLE GROUND UNITS)

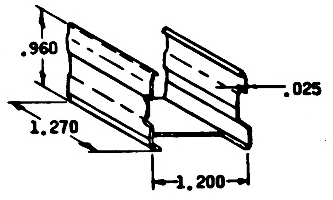
LENS COLOR DISPLAY
FIGURE 10

FIGURE 10
(VIEWS FROM FRONT OF ASSEMBLY)

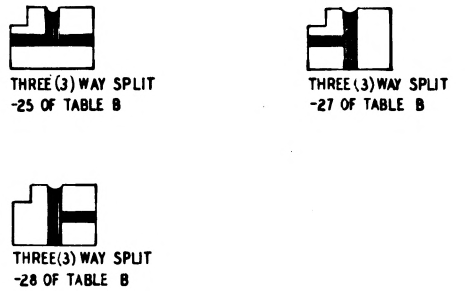

NC C NO
NC C NO
NC C NO
NC C NO
SW1
SW2
SW3
SW4
SWITCH CIRCUIT
4 POLE
(2 POLE CONSISTS OF SW1 & SW2 ONLY)
Ⓐ Ⓖ Ⓑ
Ⓓ Ⓗ Ⓒ
Ⓑ Ⓖ Ⓐ
Ⓒ Ⓓ
1
2
LAMP CIRCUIT
(ISOLATED DUAL GROUNDS)
LAMP CIRCUIT
(SINGLE GROUND)
HOLDING COIL CIRCUIT

ALL CIRCUITS ARE INDEPENDANT OF EACH OTHER UNLESS OTHERWISE STATED

SCHEMATIC DIAGRAMS
(FOR REFERENCE ONLY)
FIGURE 11


.960
.025
1,270
1,200

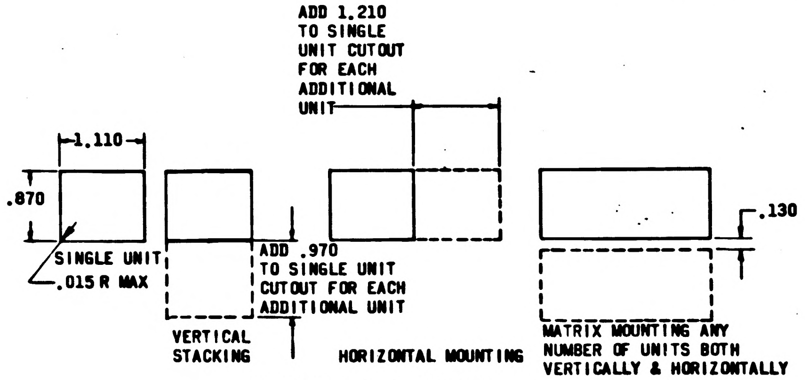
MOUNTING COVER
FIGURE 7


THREE (3) WAY SPLIT
-25 OF TABLE B
THREE (3) WAY SPLIT
-27 OF TABLE B
THREE (3) WAY SPLIT
-28 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)

FIGURE 6 CONTINUED


ADD 1.210 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
1.110
.870
SINGLE UNIT
.015 R MAX
ADD .970 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
VERTICAL STACKING
HORIZONTAL MOUNTING
MATRIX MOUNTING ANY NUMBER OF UNITS BOTH VERTICALLY & HORIZONTALLY
.130

RECOMMENDED PANEL CUTOUTS
FIGURE 8

REVISIONS 3

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	15 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO
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SCALE ——	WT	SHEET 3 OF 9

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REVISIONS C 3416

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B	REVISION STATUS CHANGED	30 SEP 65	B
C	INITIAL RELEASE CLASS A PER TDRR C 3416	18 OCT 65	REW

TABLE A, B & C FOR SPARES

TABLE A - COLORED BOOTS (FIGURE 5)

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	COLOR
-10	10-R	RED
-11	10-G	GREEN
-12	10-A	AMBER
-13	10-W	WHITE
-14	10-515	INDICATOR CLIP (SEE FIG. 9)

NOTE: WHITE COLOR IS PRODUCED WITH LIGHT BLUE BOOTS

TABLE B - LENS ASSEMBLY (FIGURE 6)

SPARE LEGEND PLATES ARE TO BE ORDERED PER THE MANUFACTURER'S PART NUMBERS LISTED IN TABLE 1 THRU 6

DIFFUSER

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	STYLE
-21	10-1	FULL DISPLAY
-22	10-2	HORIZONTALLY SPLIT DISPLAY
-23	10-3	VERTICALLY SPLIT DISPLAY
-24	10-5	FOUR (4) WAY SPLIT
-25	10-21	3 WAY SPLIT
-26	10-22	3 WAY SPLIT
-27	10-31	3 WAY SPLIT
-28	10-32	3 WAY SPLIT

TABLE C - SWITCHES

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	SWITCHING ACTION
-31	10-7	2 POLE MOMENTARY
-32	10-8	4 POLE MOMENTARY
-33	10-9	2 POLE ALTERNATE
-34	10-11	4 POLE ALTERNATE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. LEGEND CALLOUT IS DEFINED AS FOLLOWS:
   - a) A COMMA (,) IS USED TO SEPARATE LEGEND LINES
   - b) A SLASH (/) IS USED TO SEPARATE LEGENDS IN SPLIT DISPLAYS
   - c) A SHORT NARROW SLASH (/) IS USED ONLY AS A CHARACTER IN THE LEGEND.

EXAMPLE

G/N VOLTAGE PUSH RESET	
HIGH	LOW

G/N VOLTAGE, PUSH RESET/HIGH/LOW

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NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
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A	REVISION STATUS CHANGED	16 SEP 65	JJJ
B	REVISION STATUS CHANGED	30 SEP 65	B.
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TABLE I
INDICATOR ONLY (FIGURE 1)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-101	P10-C3-1-W-X-O-E	10-4-14 G&N ON, (PTC, INHIBITED)	FULL DISPLAY	W	W	W	W		-201	10-4-14 G&N ON, (PTC, INHIBITED)

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

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NASA APPROVAL
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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

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NASA DRAWING NO. 1897337
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B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR ⌐3416	18 OCT 65	REW

TABLE 2
INDICATOR LIGHT - SWITCH ASSEMBLY
TWO POLE MOMENTARY ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	MAGNETIC HOLDING COIL	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURERS LEGEND PART NUMBER
-301	PI0-AI-2-W-X-7-E	10-4-16 READ MODE/SET MODE	HORIZONTAL SPLIT	NO	W	W	W	W		-401	10-4-16 READ MODE/SET MODE
-302	↑	↑ MON COARSE/MON FINE	↑	↑	↑	↑	↑	↑		-402	↑ MON COARSE/MON FINE
-303	│	│ I G SELECT/SET ENABLE	│	│	│	│	│	│		-403	│ I G SELECT/SET ENABLE
-304	│	│ M G SELECT/SET ENABLE	│	│	│	│	│	│		-404	│ M G SELECT/SET ENABLE
-305	│	│ O G SELECT/SET ENABLE	│	│	│	│	│	│		-405	│ O G SELECT/SET ENABLE
-306	↓	↓ SHAFT SELECT/SET ENABLE	↓	↓	↓	↓	↓	↓		-406	↓ SHAFT SELECT/SET ENABLE
-307	PI0-AI-2-W-X-7-E	10-4-16 TRUN SELECT/SET ENABLE	HORIZONTAL SPLIT	NO	W	W	W	W		-407	10-4-16 TRUN SELECT/SET ENABLE

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LIGHT-INDICATOR AND
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SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
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NASA DRAWING NO 1897337
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SHEET 6 OF 9

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REVISIONS 3416			
SYM	DESCRIPTION	DATE	APPD
A	REVISED PER MXC 204913	10 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 03416	8 OCT 65	WRB JC

TABLE 3
INDICATOR - LIGHT SWITCH ASSEMBLY
TWO POLE ALTERNATE ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-501	P10-A1-1-W-X-9-E	10-4-14 INHIBIT, COMPUTER, POWER FAIL	FULL DISPLAY	W	W	W	W		-601	10-4-14 INHIBIT, COMPUTER, POWER FAIL
-502	P10-A1-2-W-X-9-E	10-4-16 MON COARSE / MON FINE	HORIZONTAL SPLIT	W	W	W	W		-602	10-4-16 MON COARSE/MON FINE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
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HEAT TREATMENT SEE REQUIREMENTS
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CHECKED Ed Foster 29 JUL 65
APPROVAL 11 Aug 65
APPROVAL
NASA APPROVAL
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
WT
SHEET 7 OF 9

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REVISIONS c3416			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED		EF
B	REVISED PER MXC-205309	30-SEP-65	B. EF
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB

TABLE 4
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE MOMENTARY ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		MAGNETIC HOLDING COIL (FIGURE 4)	FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-701	P10-B2-2-WG-X-8-E	10-4-16 CHARGING/FULL CHARGE	YES	HORIZONTAL SPLIT	W	W	G	G		-801	10-4-16 CHARGING/FULL CHARGE

1897337 C

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE —
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REVISIONS 23416			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B. EF
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB

TABLE 5
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE ALTERNATE ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-751	P10-AJ-1-W-X-11-E	10-4-13 POWER, ON	FULL DISPLAY	W	W	W	W		-851	10-4-13 POWER, ON

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO
99974	D	1897337
SCALE ——	WT	SHEET 9 OF 9

1897337 C

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REVISIONS 23416			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	E
B	REVISION STATUS CHANGED	30 SEP 65	
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP

ASSEMBLY AND MOUNTING INSTRUCTIONS

RECOMMENDED PANEL CUT-OUTS ARE SHOWN IN FIGURE 8.

DISASSEMBLY OF LIGHT

1. USING FINGERNAIL SLOTS ON SIDES, PULL LENS ASSEMBLY OUT APPROXIMATELY 5/8".
2. ROTATE LENS ASSEMBLY 90°. (SEE FIGURE A)
3. PUSH LENS IN TO RELEASE TENSION ON INDEX KEYS AND THEN PULL COMPLETE ASSEMBLY OUT.
4. BULBS, COLORED BOOTS, LENS AND LEGENDS MAY NOW BE REMOVED SEPARATELY AS SHOWN IN FIGURE B.
5. SWITCH ASSEMBLY MAY BE REMOVED BY SIMPLY RELEASING SPRING CLIPS AS SHOWN IN FIGURE B.

INSTALLATION OF LIGHT

6. TO INSTALL LIGHT IN PANEL FIRST PERFORM STEPS 1, 2, AND 3 OF DISASSEMBLY OF LIGHT.
7. UNSCREW (2) SCREWS UNTIL THE CAPTIVE NUTS REACH THE REAR OF THEIR TRAVEL RANGE (SHOWN IN FIGURE C) AND REMOVE COVER.
8. INSERT LIGHT THROUGH PANEL CUTOUT FROM THE FRONT OF PANEL AS SHOWN IN FIGURE D.
9. FROM REAR OF PANEL, SLIP COVER OVER LIGHT UNTIL IT FITS SNUGLY AGAINST REAR OF PANEL.

   A. IF MOUNTING PANEL THICKNESS IS APPROX .125 OR LESS, COVER IS INSTALLED AS SHOWN IN FIGURE D: IF PANEL THICKNESS IS GREATER THAN .125 INSTALL COVER WITH OPPOSITE END FIRST.

10. TIGHTEN THE TWO SCREWS FROM FRONT OF PANEL.
11. INSERT COMPLETE FRONT END ASSEMBLY SO THAT BULB BOARD SLOT ALIGNS WITH BULBBOARD INDEX.
12. ROTATE LENS ASSEMBLY 90° SO THAT LENS AND LEGEND INDEX IS AT TOP OF LIGHT.
13. PUSH ASSEMBLY INTO LIGHT TO COMPLETE INSTALLATION.

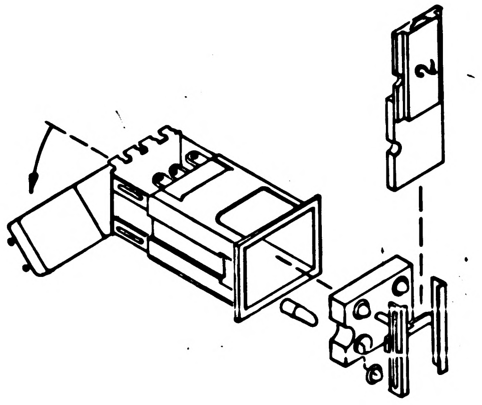

FIG. B

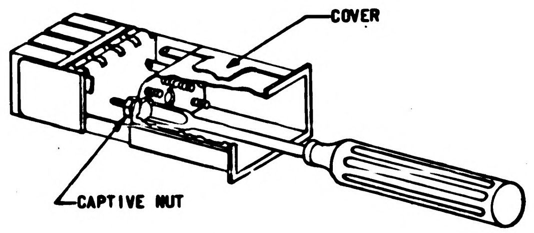

FIG. C

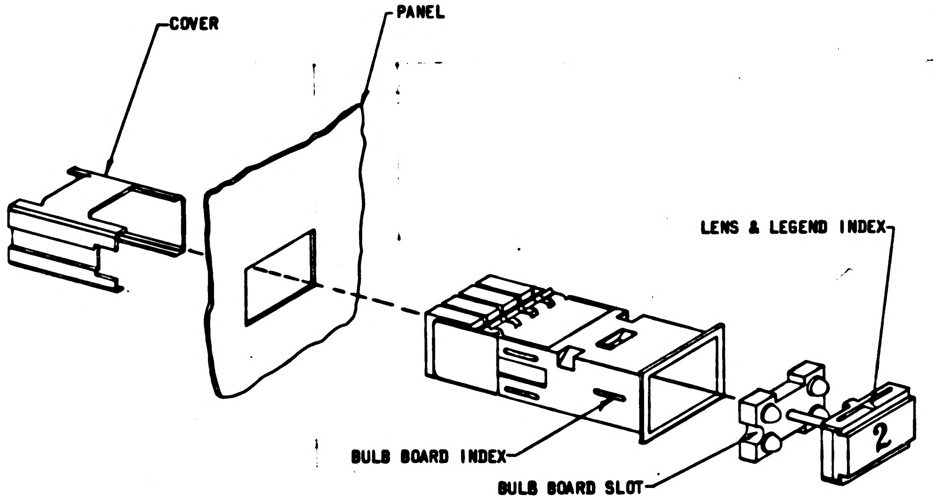

FIG. D

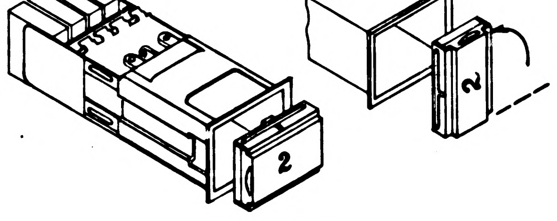

FIG. A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
1897337
SCALE —
WT
SHEET 1 OF 9

1897337 D

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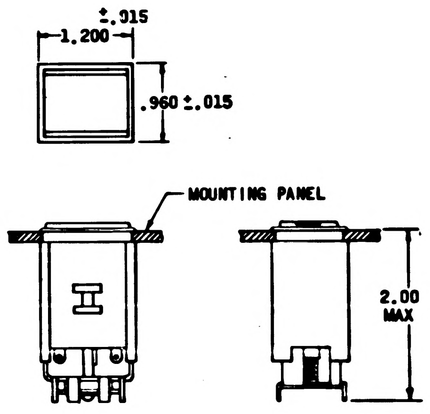
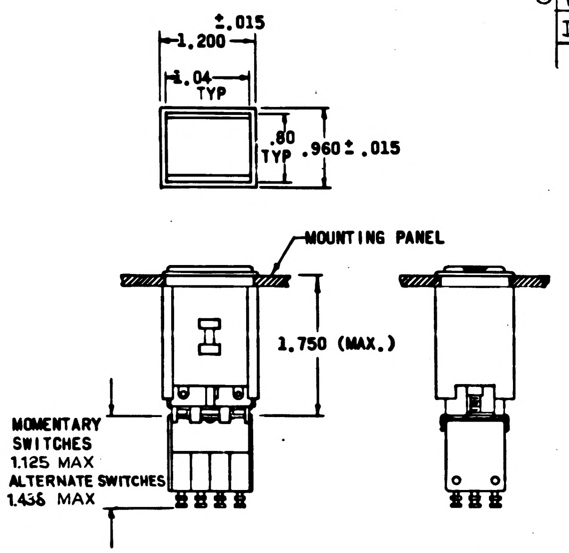
REVISIONS ~~~34.6~~			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
Ⓜ C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP

REQUIREMENTS:

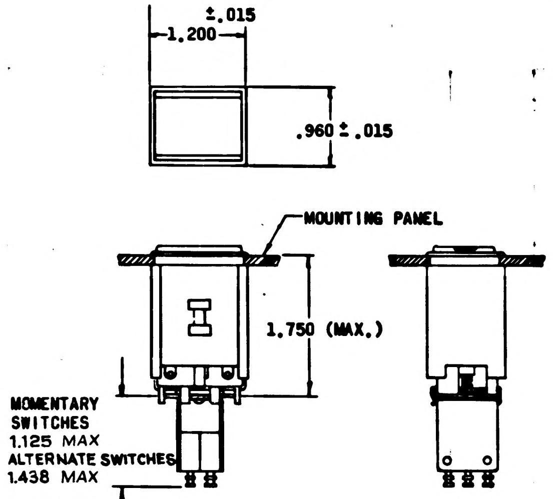
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINALS: SHALL ACCOMMODATE TWO(2) NUMBER 20 GAGE WIRES. SWITCH TERMINALS SHALL BE THE DOUBLE-TURRET TYPE, AND LAMP TERMINALS SHALL BE OF THE PIERCED SPADE TYPE. TERMINALS SHALL BE SUITABLE FOR SOLDERING.
     - (2) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - a. MANUFACTURER'S NAME OR SYMBOL
       - b. MANUFACTURER'S ASSEMBLY PART NUMBER
       - c. LAMP CIRCUIT DIAGRAM
       - d. SWITCH CALL-OUT (1,2,ETC.)(FIGURE 11)
       - e. TERMINAL NUMBERING (FIGURE 11)
         NC, C, NO FOR SWITCHES
         A, B, C, D, G, FOR LAMPS
     - (3) PHYSICAL CAPTIVITY: LAMP AND LENS ASSEMBLY SHALL BE PHYSICALLY CAPTIVE BY MEANS OF A FLEXIBLE HINGE ASSEMBLY.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) SWITCHING ACTION: PER TABLE 1 THRU 5 AND FIGURE 1 THRU 4 AND TABLE C.
     - (2) COLOR BACKGROUND: PER TABLE 1 AND FIGURE 10
     - (3) DIELECTRIC STRENGTH:
       UNIT SHALL WITHSTAND 1000 VRMS 60 CPS APPLIED FOR ONE MINUTE BETWEEN MUTUALLY INSULATED PARTS, AND INSULATED PARTS AND GROUND. THERE SHALL BE NO EVIDENCE OF ARCING, BREAKDOWN OR DAMAGE.
     - (4) INSULATION RESISTANCE:
       SHALL BE 100 MEGOHMS MINIMUM WHEN MEASURED WITH 100 VDC BETWEEN ALL MUTUALLY INSULATED POINTS



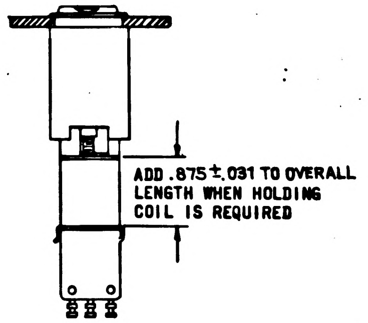
INDICATOR
FIGURE 1



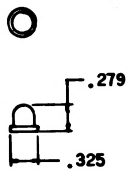
4 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 3



2 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 2


ADD .875 ±.031 TO OVERALL LENGTH WHEN HOLDING COIL IS REQUIRED

HOLDING COIL ADDITION
FIGURE 4



COLORED BULB BOOT
FIGURE 5

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

1897337 D

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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CHECKED Ed Foster 29 JUL 65
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APPROVAL
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO 99974
SIZE D
NASA DRAWING NO 1897337
SCALE ——
WT
SHEET 2 OF 9

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3. DESIGN REQUIREMENTS:

A. SWITCH CONTACTS: SHALL BE FINE SILVER, SILVER ALLOY OR SILVER PLATED BRASS.

B. SWITCH CONTACT RATING:

RATED LOAD	30V DC	125/250V AC
RESISTIVE	5.0 AMPS	5.0 AMPS
INDUCTIVE	3.0 AMPS	5.0 AMPS

C. FRONT LENS STYLE: PER TABLE 1 THRU 5 AND FIGURE 6 AND TABLE 8.

D. LEGEND: SHALL BE .120 HIGH WITH .015 STROKE WIDTH. LETTERS AS SPECIFIED IN TABLE SHALL BE REVERSE ENGRAVED ON BACK SIDE OF LENS AND THEN FILLED WITH BLACK INK. EACH LINE OF LETTERS SHALL BE CENTERED ON THE LENS.

E. LAMPS: THIS UNIT SHALL BE SUPPLIED WITH MS-25237-327 LAMPS, FOUR (4) PER UNIT, UNLESS OTHERWISE STATED IN TABLE 1 THRU TABLE 5.

F. GROUND CIRCUIT: SHALL BE SINGLE GROUND UNLESS OTHERWISE NOTED AS ISOLATED DUAL GROUNDS.

G. BOOT: SHALL BE AS SHOWN IN FIGURE 5 AND REFERENCED IN TABLE A AND TABLE 1 THRU 5.

H. MOUNTING COVER: SHALL BE AS SHOWN IN FIGURE 7. (SEE ALSO ASSEMBLY & MOUNTING)

J. INDICATOR CLIP: SHALL BE POSITIONED ON THE SHAFT AS SHOWN IN FIGURE 9. (INDICATOR ONLY - TABLE 1)

K. MAGNETIC HOLDING COIL: MAGNETIC HOLDING COIL IS AVAILABLE AT 28 VDC ON ALL MOMENTARY ACTION MODELS. SEE FIGURE 4.

(1) HOLDING COIL RESISTANCE: 435 OHMS ± 10% AT + 25°C

(2) HOLD-IN VOLTAGE: 18 VOLTS DC MINIMUM AT + 25°C.

(3) MAXIMUM OVERLOAD VOLTAGE: 32 VOLTS DC.

L. LIFE: 25,000 OPERATIONS MINIMUM AT RATED LOAD.

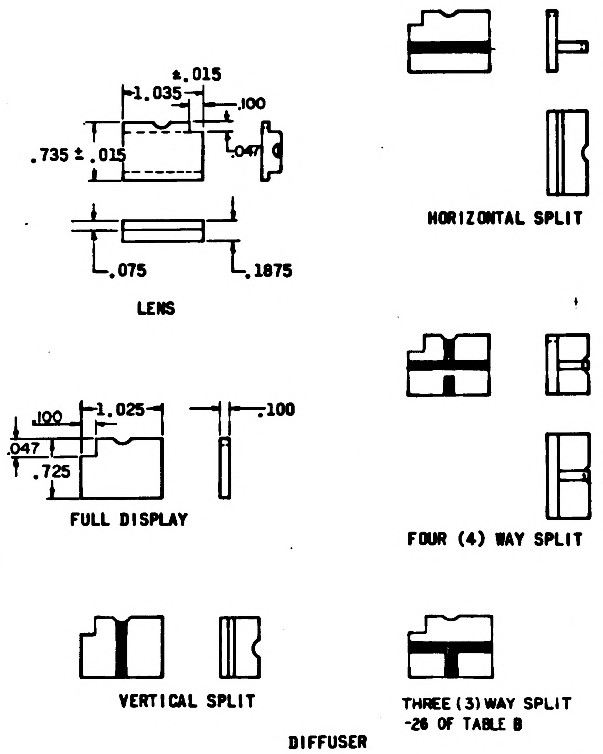
M. ENVIRONMENTAL REQUIREMENTS:

THESE UNITS SHALL MEET ALL THE FUNCTIONAL REQUIREMENTS, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTS WHEN TESTED PER THE PROCEDURES OF MIL-E-5272.

(1) VIBRATION: 10 TO 500 CPS, 10 G.

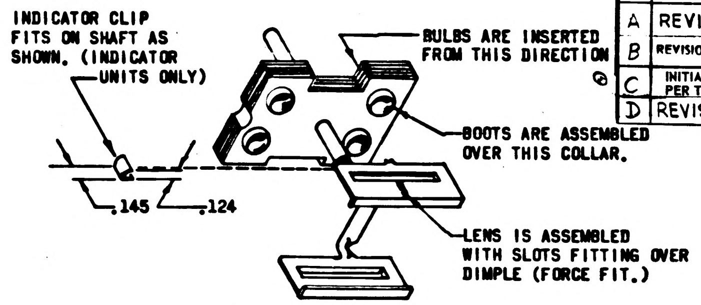
(2) SHOCK: 20 G FOR 10 MILLISECONDS

(3) TEMPERATURE: 71°C MAX. FOR 48 HOURS WITH ALL 4 LAMPS ILLUMINATED.


±.015
1.035
.100
.735 ± .015
.047
.075
.1875
LENS
.100
1.025
.100
.047
.725
FULL DISPLAY
HORIZONTAL SPLIT
FOUR (4) WAY SPLIT
VERTICAL SPLIT
THREE (3) WAY SPLIT -26 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6


INDICATOR CLIP FITS ON SHAFT AS SHOWN. (INDICATOR UNITS ONLY)
BULBS ARE INSERTED FROM THIS DIRECTION
BOOTS ARE ASSEMBLED OVER THIS COLLAR.
LENS IS ASSEMBLED WITH SLOTS FITTING OVER DIMPLE (FORCE FIT.)
.145
.124

LAMP MODULE ASSEMBLY
FIGURE 9

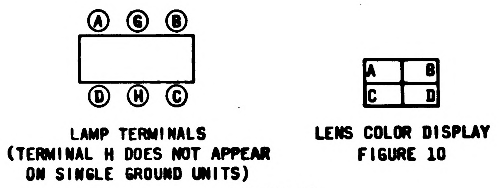
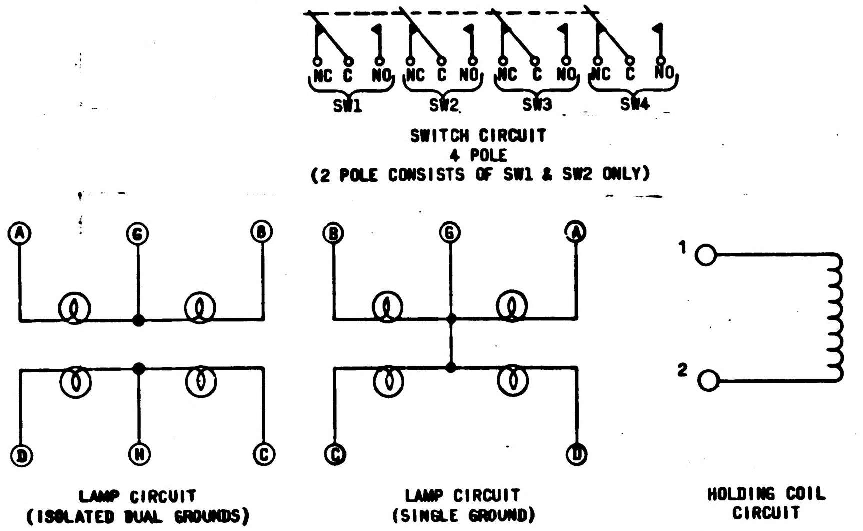
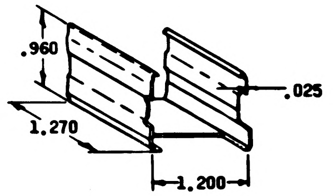

A G B
D H C
LAMP TERMINALS
(TERMINAL H DOES NOT APPEAR ON SINGLE GROUND UNITS)
A B
C D
LENS COLOR DISPLAY
FIGURE 10

FIGURE 10
(VIEWS FROM FRONT OF ASSEMBLY)

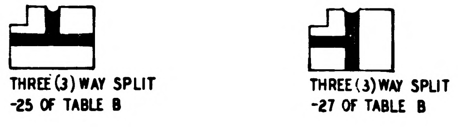

NC C NO
SW1
SW2
SW3
SW4
SWITCH CIRCUIT
4 POLE
(2 POLE CONSISTS OF SW1 & SW2 ONLY)
A G B
D H C
LAMP CIRCUIT
(ISOLATED DUAL GROUNDS)
B G A
C D
LAMP CIRCUIT
(SINGLE GROUND)
1
2
HOLDING COIL CIRCUIT

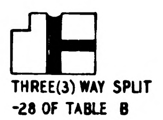
ALL CIRCUITS ARE INDEPENDANT OF EACH OTHER UNLESS OTHERWISE STATED

SCHEMATIC DIAGRAMS
(FOR REFERENCE ONLY)
FIGURE 11


.960
.025
1.270
1.200

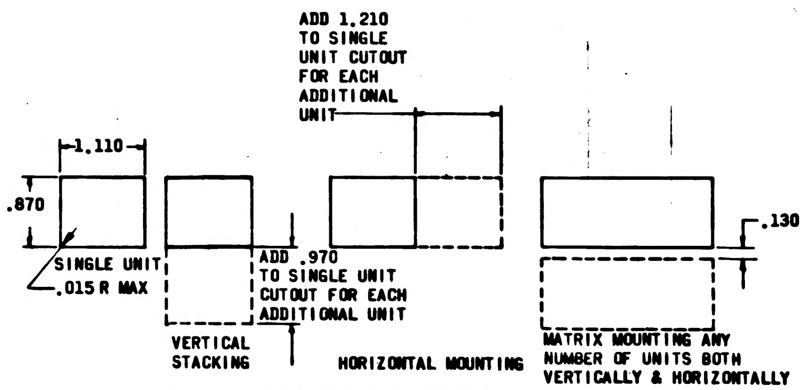
MOUNTING COVER
FIGURE 7


THREE (3) WAY SPLIT -25 OF TABLE B
THREE (3) WAY SPLIT -27 OF TABLE B


THREE (3) WAY SPLIT -28 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6 CONTINUED


ADD 1.210 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
1.110
.870
SINGLE UNIT
.015 R MAX
ADD .970 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
VERTICAL STACKING
HORIZONTAL MOUNTING
.130
MATRIX MOUNTING ANY NUMBER OF UNITS BOTH VERTICALLY & HORIZONTALLY

RECOMMENDED PANEL CUTOUTS
FIGURE 8

REVISIONS — 3

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TORR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP

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LIGHT - INDICATOR AND
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C	INITIAL RELEASE CLASS A PER TDRR ε3416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP

TABLE A, B & C FOR SPARES

TABLE A - COLORED BOOTS (FIGURE 5)

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	COLOR
-10	10-R	RED
-11	10-G	GREEN
-12	10-A	AMBER
-13	10-W	WHITE
-14	10-515	INDICATOR CLIP (SEE FIG. 9)

NOTE: WHITE COLOR IS PRODUCED WITH LIGHT BLUE BOOTS

TABLE B - LENS ASSEMBLY (FIGURE 6)

SPARE LEGEND PLATES ARE TO BE ORDERED PER THE MANUFACTURER'S PART NUMBERS LISTED IN TABLE 1 THRU 6

DIFFUSER

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	STYLE
-21	10-1	FULL DISPLAY
-22	10-2	HORIZONTALLY SPLIT DISPLAY
-23	10-3	VERTICALLY SPLIT DISPLAY
-24	10-5	FOUR (4) WAY SPLIT
-25	10-21	3 WAY SPLIT
-26	10-22	3 WAY SPLIT
-27	10-31	3 WAY SPLIT
-28	10-32	3 WAY SPLIT

TABLE C - SWITCHES

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	SWITCHING ACTION
-31	10-7	2 POLE MOMENTARY
-32	10-8	4 POLE MOMENTARY
-33	10-9	2 POLE ALTERNATE
-34	10-11	4 POLE ALTERNATE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. LEGEND CALLOUT IS DEFINED AS FOLLOWS:
   a) A COMMA (,) IS USED TO SEPARATE LEGEND LINES
   b) A SLASH (/) IS USED TO SEPARATE LEGENDS IN SPLIT DISPLAYS
   c) A SHORT NARROW SLASH (/) IS USED ONLY AS A CHARACTER IN THE LEGEND.

EXAMPLE

G/N VOLTAGE PUSH RESET	
HIGH	LOW

G/N VOLTAGE, PUSH RESET/HIGH/LOW

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TABLE I
INDICATOR ONLY (FIGURE 1)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-101	P10-C3-1-W-X-0-E	10-4-14 G&N ON, (PTC, INHIBITED)	FULL DISPLAY	W	W	W	W		-201	10-4-14 G&N ON, (PTC, INHIBITED)

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TABLE 2

INDICATOR LIGHT - SWITCH ASSEMBLY
TWO POLE MOMENTARY ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	MAGNETIC HOLDING COIL	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURERS LEGEND PART NUMBER
-301	P10-A1-2-W-X-7-E	10-4-16 READ MODE/SET MODE	HORIZONTAL SPLIT	NO	W	W	W	W		-401	10-4-16 READ MODE/SET MODE
-302	↑	↑ MON COARSE/MON FINE	↑	↑	↑	↑	↑	↑		-402	↑ MON COARSE/MON FINE
-303		I G SELECT/SET ENABLE								-403	I G SELECT/SET ENABLE
-304		M G SELECT/SET ENABLE								-404	M G SELECT/SET ENABLE
-305		O G SELECT/SET ENABLE								-405	O G SELECT/SET ENABLE
-306	↓	↓ SHAFT SELECT/SET ENABLE	↓	↓	↓	↓	↓	↓		-406	↓ SHAFT SELECT/SET ENABLE
-307	P10-A1-2-W-X-7-E	10-4-16 TRUN SELECT/SET ENABLE	HORIZONTAL SPLIT	NO	W	W	W	W		-407	10-4-16 TRUN SELECT/SET ENABLE

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A	REVISED PER MXC 204913	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 3416	8 OCT 65	WRB
D	REVISION STATUS CHANGED	30 NOV 65	RLP

TABLE 3
INDICATOR - LIGHT SWITCH ASSEMBLY
TWO POLE ALTERNATE ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-501	P10-A1-1-W-X-9-E	10-4-14 INHIBIT, COMPUTER, POWER FAIL	FULL DISPLAY	W	W	W	W		-601	10-4-14 INHIBIT, COMPUTER, POWER FAIL
-502	P10-A1-2-W-X-9-E	10-4-16 MON COARSE / MON FINE	HORIZONTAL SPLIT	W	W	W	W		-602	10-4-16 MON COARSE/MON FINE

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A	REVISION STATUS CHANGED	6 SEP	EF
B	REVISED PER MXC-205309	30-SEP-65	B. EF
C	INITIAL RELEASE CLASS A PER TDRR 234.6	18 OCT 65	WRB TE
D	REVISED PER TDRR 24063	30 NOV 65	RLP

TABLE 4
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE MOMENTARY ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		MAGNETIC HOLDING COIL (FIGURE 4)	FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-701	P10-82-2-WG-X-8-E	10-4-16 CHARGING/FULL CHARGE	YES	HORIZONTAL SPLIT	W	W	G	G		-801	10-4-16 CHARGING/FULL CHARGE

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A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B. EF
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB
D	REVISION STATUS CHANGED	30 NOV 65	RU

TABLE 5
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE ALTERNATE ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-751	P10-A1-1-W-X-11-E	10-4-13 POWER, ON	FULL DISPLAY	W	W	W	W		-851	10-4-13 POWER, ON

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A	REVISION STATUS CHANGED	10 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP

ASSEMBLY AND MOUNTING INSTRUCTIONS

RECOMMENDED PANEL CUT-OUTS ARE SHOWN IN FIGURE 8.

DISASSEMBLY OF LIGHT

1. USING FINGERNAIL SLOTS ON SIDES, PULL LENS ASSEMBLY OUT APPROXIMATELY 5/8".
2. ROTATE LENS ASSEMBLY 90°. (SEE FIGURE A)
3. PUSH LENS IN TO RELEASE TENSION ON INDEX KEYS AND THEN PULL COMPLETE ASSEMBLY OUT.
4. BULBS, COLORED BOOTS, LENS AND LEGENDS MAY NOW BE REMOVED SEPARATELY AS SHOWN IN FIGURE B.
5. SWITCH ASSEMBLY MAY BE REMOVED BY SIMPLY RELEASING SPRING CLIPS AS SHOWN IN FIGURE B.

INSTALLATION OF LIGHT

6. TO INSTALL LIGHT IN PANEL FIRST PERFORM STEPS 1, 2, AND 3 OF DISASSEMBLY OF LIGHT.
7. UNSCREW (2) SCREWS UNTIL THE CAPTIVE NUTS REACH THE REAR OF THEIR TRAVEL RANGE (SHOWN IN FIGURE C) AND REMOVE COVER.
8. INSERT LIGHT THROUGH PANEL CUTOUT FROM THE FRONT OF PANEL AS SHOWN IN FIGURE D.
9. FROM REAR OF PANEL, SLIP COVER OVER LIGHT UNTIL IT FITS SNUGLY AGAINST REAR OF PANEL.

   A. IF MOUNTING PANEL THICKNESS IS APPROX .125 OR LESS, COVER IS INSTALLED AS SHOWN IN FIGURE D: IF PANEL THICKNESS IS GREATER THAN .125 INSTALL COVER WITH OPPOSITE END FIRST.

10. TIGHTEN THE TWO SCREWS FROM FRONT OF PANEL.
11. INSERT COMPLETE FRONT END ASSEMBLY SO THAT BULB BOARD SLOT ALIGNS WITH BULBBOARD INDEX.
12. ROTATE LENS ASSEMBLY 90° SO THAT LENS AND LEGEND INDEX IS AT TOP OF LIGHT.
13. PUSH ASSEMBLY INTO LIGHT TO COMPLETE INSTALLATION.

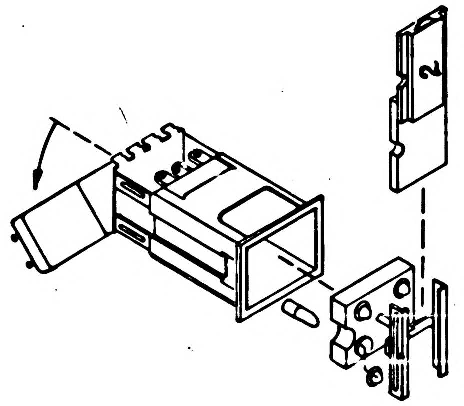

FIG. B

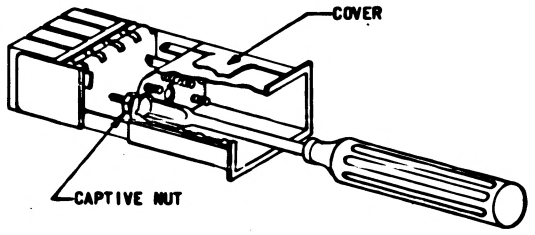

FIG. C

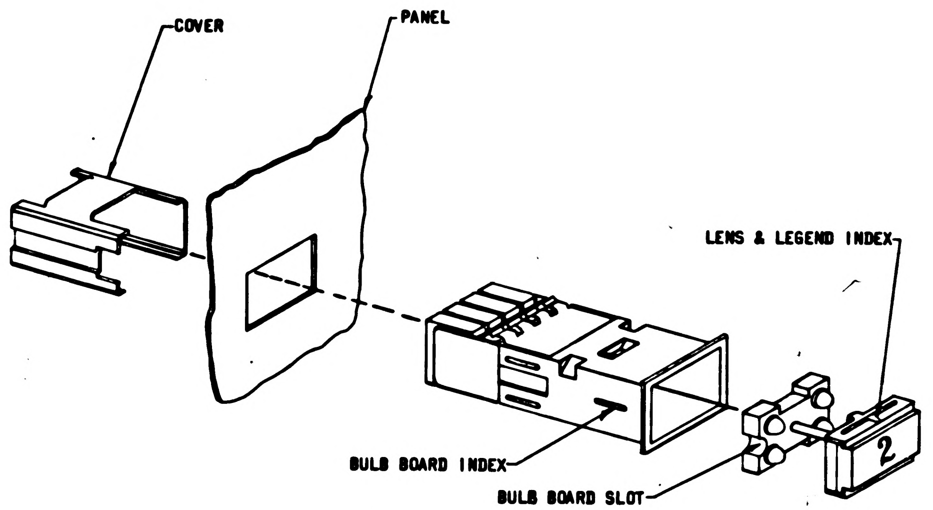

FIG. D

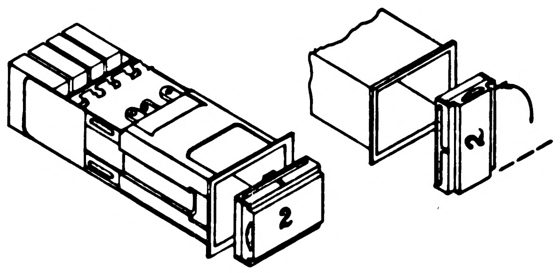

FIG. A

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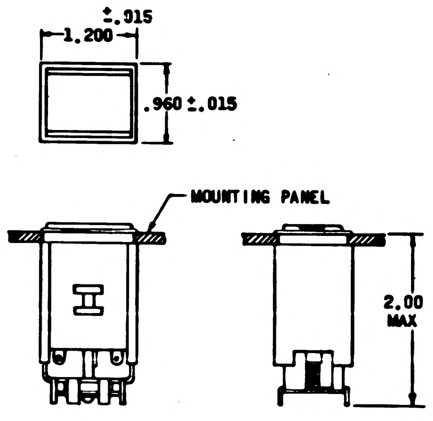
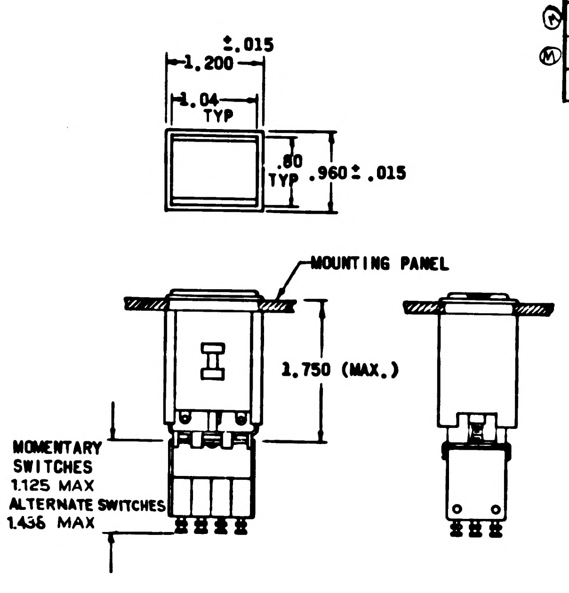
REVISIONS ~~C~~3416			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	
B	REVISION STATUS CHANGED	30 SEP 65	B.
Ⓐ C	INITIAL RELEASE CLASS A PER TDRR C3416	18 OCT 65	REW
Ⓜ D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP

REQUIREMENTS:

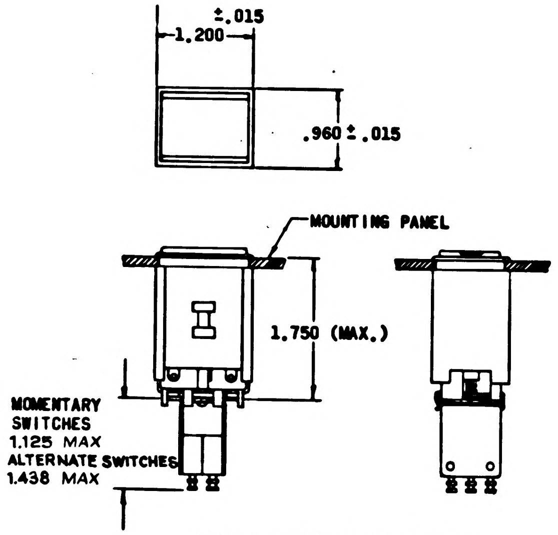
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINALS: SHALL ACCOMMODATE TWO(2) NUMBER 20 GAGE WIRES. SWITCH TERMINALS SHALL BE THE DOUBLE-TURRET TYPE, AND LAMP TERMINALS SHALL BE OF THE PIERCED SPADE TYPE. TERMINALS SHALL BE SUITABLE FOR SOLDERING.
     - (2) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - a. MANUFACTURER'S NAME OR SYMBOL
       - b. MANUFACTURER'S ASSEMBLY PART NUMBER
       - c. LAMP CIRCUIT DIAGRAM
       - d. SWITCH CALL-OUT (1, 2, ETC.)(FIGURE II)
       - e. TERMINAL NUMBERING (FIGURE II)
         - NC, C, NO FOR SWITCHES
         - A, B, C, D, G, FOR LAMPS
     - (3) PHYSICAL CAPTIVITY: LAMP AND LENS ASSEMBLY SHALL BE PHYSICALLY CAPTIVE BY MEANS OF A FLEXIBLE HINGE ASSEMBLY.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) SWITCHING ACTION: PER TABLE 1 THRU 5 AND FIGURE 1 THRU 4 AND TABLE C.
     - (2) COLOR BACKGROUND: PER TABLE 1 AND FIGURE 10
     - (3) DIELECTRIC STRENGTH: UNIT SHALL WITHSTAND 1000 VRMS 60 CPS APPLIED FOR ONE MINUTE BETWEEN MUTUALLY INSULATED PARTS, AND INSULATED PARTS AND GROUND. THERE SHALL BE NO EVIDENCE OF ARCING, BREAKDOWN OR DAMAGE.
     - (4) INSULATION RESISTANCE: SHALL BE 100 MEGOHMS MINIMUM WHEN MEASURED WITH 100 VDC BETWEEN ALL MUTUALLY INSULATED POINTS



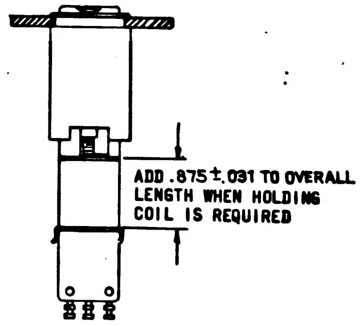
INDICATOR
FIGURE 1



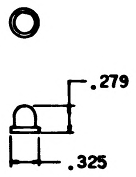
4 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 3



2 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 2


ADD .875±.031 TO OVERALL LENGTH WHEN HOLDING COIL IS REQUIRED

HOLDING COIL ADDITION
FIGURE 4



COLORED BULB BOOT
FIGURE 5

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1C02034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .010 ANGLES ± 1/2°
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS

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DWG NO
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DRAWN J. Petterson DATE 29 Jul 65
CHECKED Ed Foster 29 Jul 65
APPROVAL [illegible] 11 Aug 65
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
WT
SHEET 2 OF 9

1897337 E

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REVISIONS			
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B	REVISION STATUS CHANGED	30 SEP 65	B. E
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP

3. DESIGN REQUIREMENTS:

A. SWITCH CONTACTS: SHALL BE FINE SILVER, SILVER ALLOY OR SILVER PLATED BRASS.

B. SWITCH CONTACT RATING:

RATED LOAD	30V DC	125/250V AC
RESISTIVE	5.0 AMPS	5.0 AMPS
INDUCTIVE	3.0 AMPS	5.0 AMPS

C. FRONT LENS STYLE: PER TABLE 1 THRU 5 AND FIGURE 6 AND TABLE 8.

D. LEGEND: SHALL BE .120 HIGH WITH .015 STROKE WIDTH. LETTERS AS SPECIFIED IN TABLE SHALL BE REVERSE ENGRAVED ON BACK SIDE OF LENS AND THEN FILLED WITH BLACK INK. EACH LINE OF LETTERS SHALL BE CENTERED ON THE LENS.

E. LAMPS: THIS UNIT SHALL BE SUPPLIED WITH MS-25237-327 LAMPS, FOUR (4) PER UNIT, UNLESS OTHERWISE STATED IN TABLE 1 THRU TABLE 5.

F. GROUND CIRCUIT: SHALL BE SINGLE GROUND UNLESS OTHERWISE NOTED AS ISOLATED DUAL GROUNDS.

G. BOOT: SHALL BE AS SHOWN IN FIGURE 5 AND REFERENCED IN TABLE A AND TABLE 1 THRU 5.

H. MOUNTING COVER: SHALL BE AS SHOWN IN FIGURE 7. (SEE ALSO ASSEMBLY & MOUNTING)

J. INDICATOR CLIP: SHALL BE POSITIONED ON THE SHAFT AS SHOWN IN FIGURE 9. (INDICATOR ONLY - TABLE 1)

K. MAGNETIC HOLDING COIL: MAGNETIC HOLDING COIL IS AVAILABLE AT 28 VDC ON ALL MOMENTARY ACTION MODELS. SEE FIGURE 4.

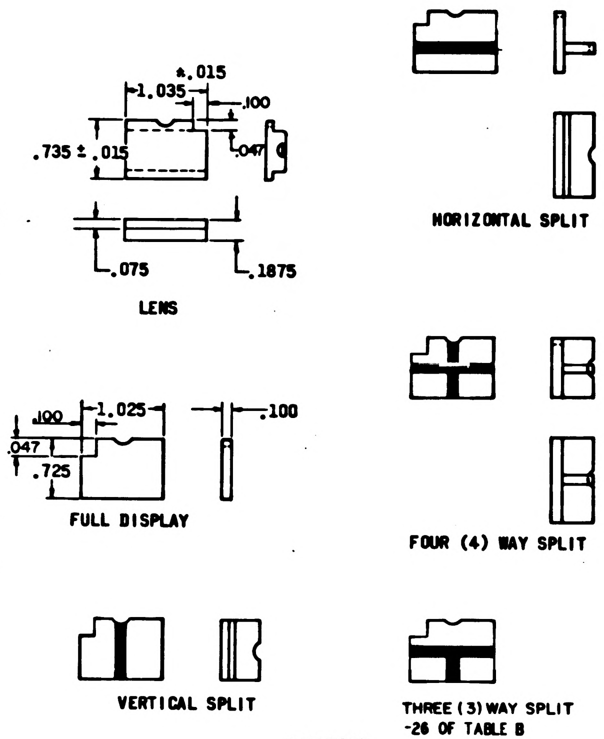
(1) HOLDING COIL RESISTANCE: 435 OHMS ± 10% AT + 25°C
(2) HOLD-IN VOLTAGE: 18 VOLTS DC MINIMUM AT + 25°C.
(3) MAXIMUM OVERLOAD VOLTAGE: 32 VOLTS DC.

L. LIFE: 25,000 OPERATIONS MINIMUM AT RATED LOAD.

M. ENVIRONMENTAL REQUIREMENTS:

THESE UNITS SHALL MEET ALL THE FUNCTIONAL REQUIREMENTS, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTS WHEN TESTED PER THE PROCEDURES OF MIL-E-5272.

(1) VIBRATION: 10 TO 500 CPS, 10 G.
(2) SHOCK: 20 G FOR 10 MILLISECONDS
(3) TEMPERATURE: 71°C MAX. FOR 48 HOURS WITH ALL 4 LAMPS ILLUMINATED.


±.015
1.035
.100
.735 ± .015
.047
.075
.1875
1.025
.100
.047
.725
.100

LENS

FULL DISPLAY

VERTICAL SPLIT

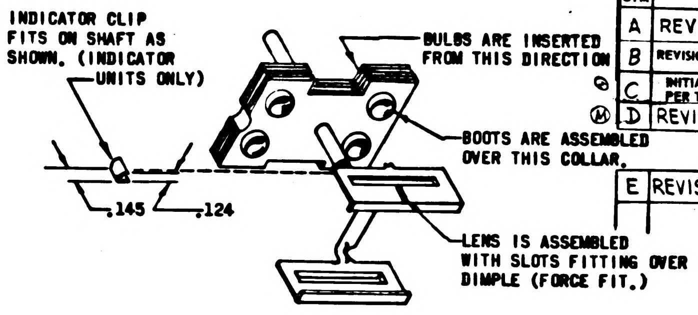
HORIZONTAL SPLIT

FOUR (4) WAY SPLIT

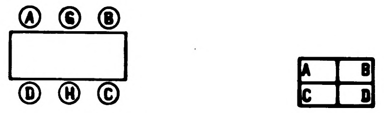
THREE (3) WAY SPLIT
-26 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6


INDICATOR CLIP FITS ON SHAFT AS SHOWN. (INDICATOR UNITS ONLY)
BULBS ARE INSERTED FROM THIS DIRECTION
BOOTS ARE ASSEMBLED OVER THIS COLLAR.
LENS IS ASSEMBLED WITH SLOTS FITTING OVER DIMPLE (FORCE FIT.)
.145
.124

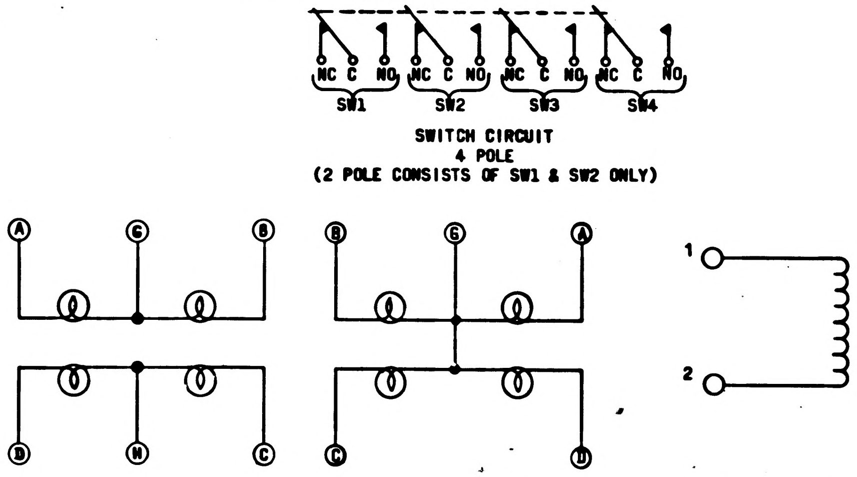
LAMP MODULE ASSEMBLY
FIGURE 9


A
G
B
D
H
C
A
B
C
D

LAMP TERMINALS
(TERMINAL H DOES NOT APPEAR ON SINGLE GROUND UNITS)

LENS COLOR DISPLAY
FIGURE 10

FIGURE 10
(VIEWS FROM FRONT OF ASSEMBLY)


NC C NO
SW1
SW2
SW3
SW4
A
G
B
D
H
C
B
G
A
C
D
1
2

SWITCH CIRCUIT
4 POLE
(2 POLE CONSISTS OF SW1 & SW2 ONLY)

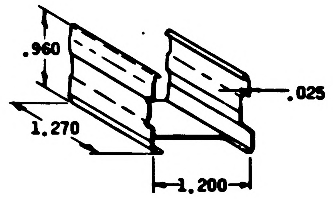
LAMP CIRCUIT
(ISOLATED DUAL GROUNDS)

LAMP CIRCUIT
(SINGLE GROUND)

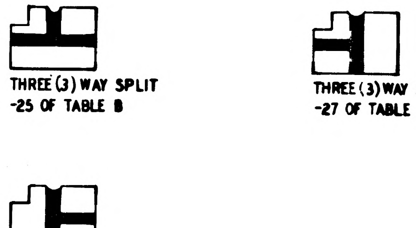
HOLDING COIL CIRCUIT

ALL CIRCUITS ARE INDEPENDANT OF EACH OTHER UNLESS OTHERWISE STATED

SCHEMATIC DIAGRAMS
(FOR REFERENCE ONLY)
FIGURE 11


.960
.025
1.270
1.200

MOUNTING COVER
FIGURE 7



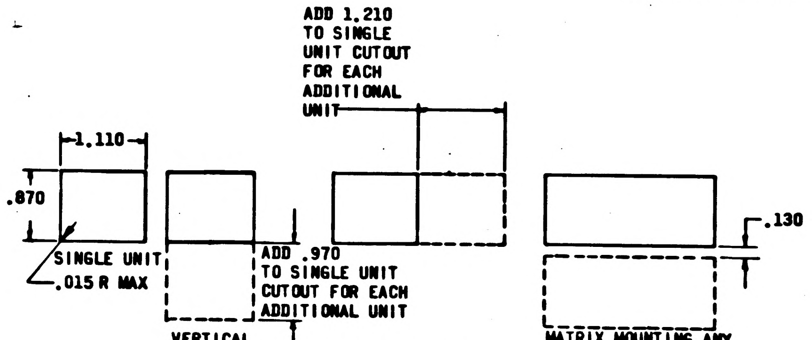
THREE (3) WAY SPLIT
-25 OF TABLE B

THREE (3) WAY SPLIT
-27 OF TABLE B

THREE (3) WAY SPLIT
-28 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6 CONTINUED


ADD 1.210 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
1.110
.870
SINGLE UNIT
.015 R MAX
ADD .970 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
.130
VERTICAL STACKING
HORIZONTAL MOUNTING
MATRIX MOUNTING ANY NUMBER OF UNITS BOTH VERTICALLY & HORIZONTALLY

RECOMMENDED PANEL CUTOUTS
FIGURE 8

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

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TOLERANCES ON
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DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
SEE REQUIREMENTS

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO
99974	D	1897337
SCALE —	WT	SHEET 3 OF 9

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REVISIONS E3916

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	JJJ EF
B	REVISION STATUS CHANGED	30 SEP 65	B. E
C	INITIAL RELEASE CLASS A PER TDRR E3916	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP

TABLE A, B & C FOR SPARES

TABLE A - COLORED BOOTS (FIGURE 5)

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	COLOR
-10	10-R	RED
-11	10-G	GREEN
-12	10-A	AMBER
-13	10-W	WHITE
-14	10-515	INDICATOR CLIP(SEE FIG.9)

NOTE: WHITE COLOR IS PRODUCED WITH LIGHT BLUE BOOTS

TABLE B - LENS ASSEMBLY (FIGURE 6)

SPARE LEGEND PLATES ARE TO BE ORDERED PER THE MANUFACTURER'S PART NUMBERS LISTED IN TABLE 1 THRU 6

DIFFUSER

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	STYLE
-21	10-1	FULL DISPLAY
-22	10-2	HORIZONTALLY SPLIT DISPLAY
-23	10-3	VERTICALLY SPLIT DISPLAY
-24	10-5	FOUR (4) WAY SPLIT
-25	10-21	3 WAY SPLIT
-26	10-22	3 WAY SPLIT
-27	10-31	3 WAY SPLIT
-28	10-32	3 WAY SPLIT

TABLE C - SWITCHES

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	SWITCHING ACTION
-31	10-7	2 POLE MOMENTARY
-32	10-8	4 POLE MOMENTARY
-33	10-9	2 POLE ALTERNATE
-34	10-11	4 POLE ALTERNATE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. LEGEND CALLOUT IS DEFINED AS FOLLOWS:
   a) A COMMA (,) IS USED TO SEPARATE LEGEND LINES
   b) A SLASH (/) IS USED TO SEPARATE LEGENDS IN SPLIT DISPLAYS.
   c) A SHORT NARROW SLASH (/) IS USED ONLY AS A CHARACTER IN THE LEGEND.

EXAMPLE

G/N VOLTAGE
PUSH RESET
HIGH | LOW

G/N VOLTAGE, PUSH RESET/HIGH/LOW

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
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FRACTIONS ± — DECIMALS ±.010 ANGLES ±½°
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MATERIAL SEE REQUIREMENTS
HEAT TREATMENT SEE REQUIREMENTS
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DRAWN J Peterson DATE 29 JUL 65
CHECKED Ed Foster 29 JUL 65
APPROVAL [illegible] AUG 65
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE —
WT
SHEET 4 OF 9

1897337 E

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REVISIONS 23416			
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A	REVISION STATUS CHANGED	16 SEP 65	JJJ CF
B	REVISION STATUS CHANGED	30 SEP 65	B. CF
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW FE
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP

TABLE I
INDICATOR ONLY (FIGURE 1)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-101	PI0-C3-1-W-X-0-E	10-4-14 G&N ON, (PTC, INHIBITED)	FULL DISPLAY	W	W	W	W		-201	10-4-14 G&N ON, (PTC, INHIBITED)

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

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LIST OF MATERIALS			

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
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SCALE —
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SHEET 5 OF 9

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TABLE 2

INDICATOR LIGHT - SWITCH ASSEMBLY
TWO POLE MOMENTARY ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	MAGNETIC HOLDING COIL	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURERS LEGEND PART NUMBER
-301	P10-A1-2-W-X-7-E	10-4-16 READ MODE/SET MODE	HORIZONTAL SPLIT	NO	W	W	W	W		-401	10-4-16 READ MODE/SET MODE
-302	↑	↑ MON COARSE/MON FINE	↑	↑	↑	↑	↑	↑		-402	↑ MON COARSE/MON FINE
-303		I G SELECT/SET ENABLE								-403	I G SELECT/SET ENABLE
-304		M G SELECT/SET ENABLE								-404	M G SELECT/SET ENABLE
-305		O G SELECT/SET ENABLE								-405	O G SELECT/SET ENABLE
-306	↓	↓ SHAFT SELECT/SET ENABLE	↓	↓	↓	↓	↓	↓		-406	↓ SHAFT SELECT/SET ENABLE
-307	P10-A1-2-W-X-7-E	10-4-16 TRUN SELECT/SET ENABLE	HORIZONTAL SPLIT	NO	W	W	W	W		-407	10-4-16 TRUN SELECT/SET ENABLE

REVISIONS 3416

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HEAT TREATMENT
SEE REQUIREMENTS
FINAL FINISH
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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE
WT
SHEET 6 OF 9

1897337 E

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REVISIONS -3416			
SYM	DESCRIPTION	DATE	APPD
A	REVISED PER MXC 204913	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B
C	INITIAL RELEASE CLASS A PER TDRR 03416	8 OCT 65	WRB FC
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISED PER TDRR 24404	3 DEC 65	RLP

TABLE 3
INDICATOR - LIGHT SWITCH ASSEMBLY
TWO POLE ALTERNATE ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-501	P10-A1-1-W-X-9-E	10-4-14 INHIBIT, COMPUTER, POWER FAIL	FULL DISPLAY	W	W	W	W		-601	10-4-14 INHIBIT, COMPUTER, POWER FAIL
-502	P10-A1-2-W-X-9-E	10-4-16 MON COARSE/MON FINE	HORIZONTAL SPLIT	W	W	W	W		-602	10-4-16 MON COARSE/MON FINE
-503	P10-A1-1-W-X-9-E	10-4-14 READ, RATE TABLE, INPUT	FULL DISPLAY	W	W	W	W		-603	10-4-14 READ, RATE TABLE, INPUT
-504	P10-A1-1-W-X-9-E	10-4-14 LORS, RATE TABLE, CONTROL	FULL DISPLAY	W	W	W	W		-604	10-4-14 LORS, RATE TABLE, CONTROL

1897337 E

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LIST OF MATERIALS

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APPROVAL 10-30-65
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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
WT
SHEET 7 OF 9

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REVISIONS 234.6			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP	EF
B	REVISED PER MXC-205309	30-SEP-65	EF
C	INITIAL RELEASE CLASS A PER TDRR 234.6	18 OCT 65	WRB
D	REVISED PER TDRR 24063	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP

TABLE 4
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE MOMENTARY ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		MAGNETIC HOLDING COIL (FIGURE 4)	FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-701	P10-B2-2-WG-X-8-E	10-4-16 CHARGING/FULL CHARGE	YES	HORIZONTAL SPLIT	W	W	G	G		-801	10-4-16 CHARGING/FULL CHARGE

1897337 E

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE —
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REVISIONS		23416	
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	JB. EF
Ⓒ C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB
Ⓜ D	REVISION STATUS CHANGED	30 NOV 65	RW
E	REVISION STATUS CHANGED	3 DEC 65	RW

TABLE 5
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE ALTERNATE ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D	
-751	P10-A1-1-W-X-11-E	10-4-13 POWER, ON	FULL DISPLAY	W	W	W	W	

LENS ASSEMBLY (LEGEND PLATES ONLY)	
NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-851	10-4-13 POWER, ON

1897337 E

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

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NASA DRAWING NO. 1897337
SCALE —
WT
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SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	[illegible] SEP 65	E
B	REVISION STATUS CHANGED	30 SEP 65	J.S.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REN
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP

ASSEMBLY AND MOUNTING INSTRUCTIONS

RECOMMENDED PANEL CUT-OUTS ARE SHOWN IN FIGURE 8.

DISASSEMBLY OF LIGHT

1. USING FINGERNAIL SLOTS ON SIDES, PULL LENS ASSEMBLY OUT APPROXIMATELY 5/8".
2. ROTATE LENS ASSEMBLY 90°. (SEE FIGURE A)
3. PUSH LENS IN TO RELEASE TENSION ON INDEX KEYS AND THEN PULL COMPLETE ASSEMBLY OUT.
4. BULBS, COLORED BOOTS, LENS AND LEGENDS MAY NOW BE REMOVED SEPARATELY AS SHOWN IN FIGURE B.
5. SWITCH ASSEMBLY MAY BE REMOVED BY SIMPLY RELEASING SPRING CLIPS AS SHOWN IN FIGURE B.

INSTALLATION OF LIGHT

6. TO INSTALL LIGHT IN PANEL FIRST PERFORM STEPS 1, 2, AND 3 OF DISASSEMBLY OF LIGHT.
7. UNSCREW (2) SCREWS UNTIL THE CAPTIVE NUTS REACH THE REAR OF THEIR TRAVEL RANGE (SHOWN IN FIGURE C) AND REMOVE COVER.
8. INSERT LIGHT THROUGH PANEL CUTOUT FROM THE FRONT OF PANEL AS SHOWN IN FIGURE D.
9. FROM REAR OF PANEL, SLIP COVER OVER LIGHT UNTIL IT FITS SNUGLY AGAINST REAR OF PANEL.

   A. IF MOUNTING PANEL THICKNESS IS APPROX .125 OR LESS, COVER IS INSTALLED AS SHOWN IN FIGURE D: IF PANEL THICKNESS IS GREATER THAN .125 INSTALL COVER WITH OPPOSITE END FIRST.

10. TIGHTEN THE TWO SCREWS FROM FRONT OF PANEL.
11. INSERT COMPLETE FRONT END ASSEMBLY SO THAT BULB BOARD SLOT ALIGNS WITH BULBBOARD INDEX.
12. ROTATE LENS ASSEMBLY 90° SO THAT LENS AND LEGEND INDEX IS AT TOP OF LIGHT.
13. PUSH ASSEMBLY INTO LIGHT TO COMPLETE INSTALLATION.

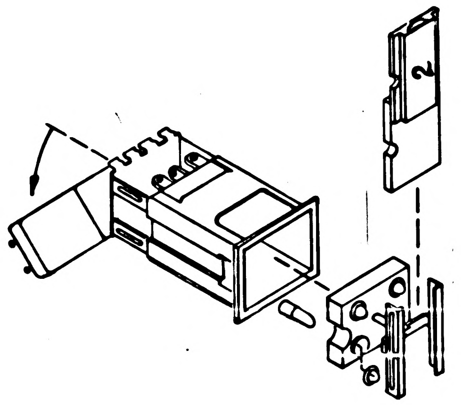

FIG. B

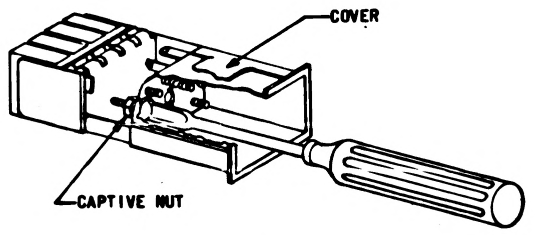

FIG. C

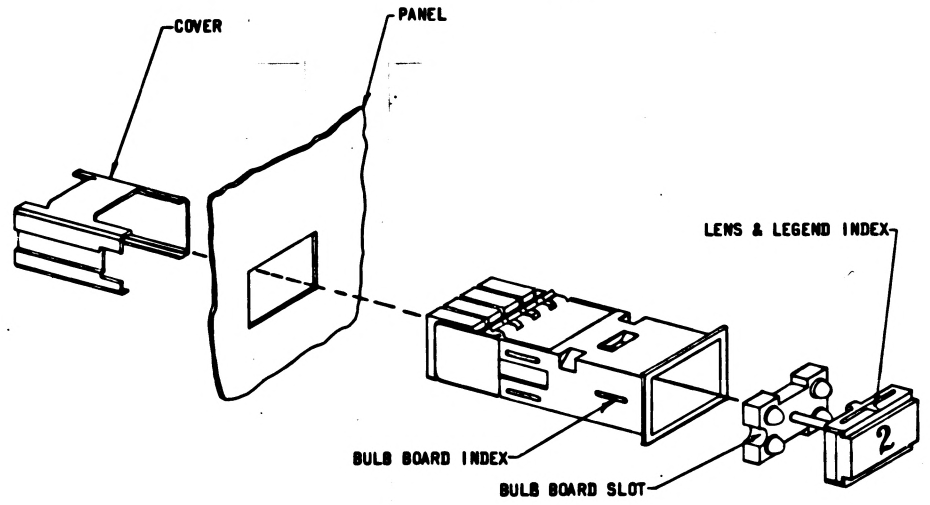

FIG. D

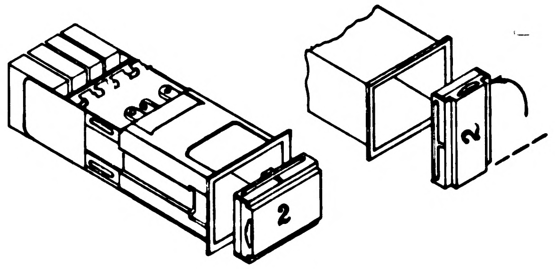

FIG. A

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

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SIZE D
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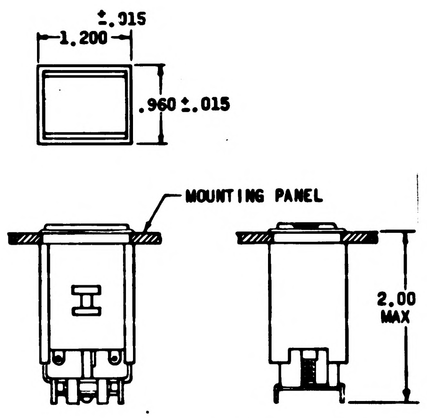
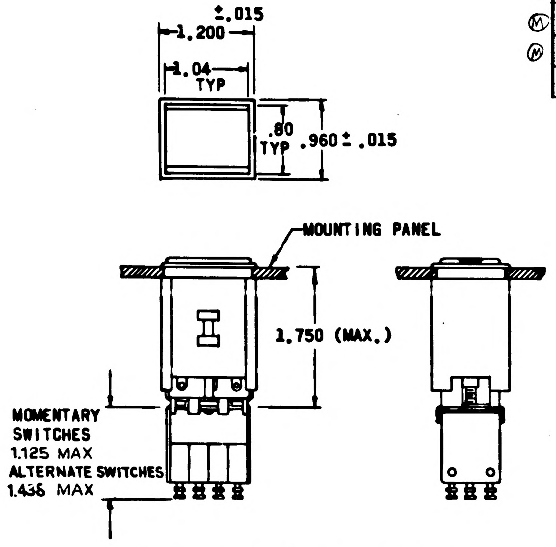
Ⓜ C	INITIAL RELEASE CLASS A PER TDRR .3416	18 OCT 65	REW
Ⓜ D	REVISION STATUS CHANGED	30 NOV 65	RLP
Ⓜ E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP

REQUIREMENTS:

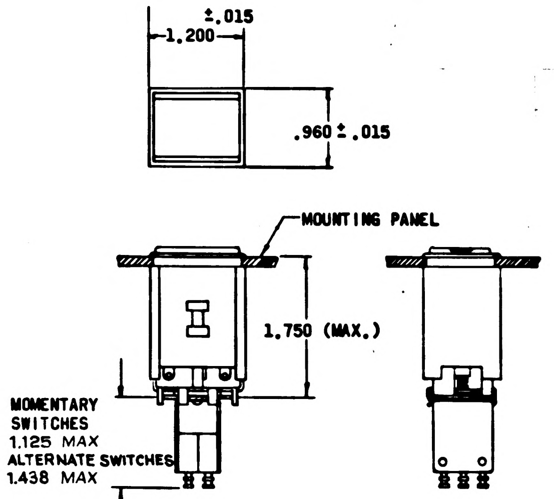
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINALS: SHALL ACCOMMODATE TWO(2) NUMBER 20 GAGE WIRES. SWITCH TERMINALS SHALL BE THE DOUBLE-TURRET TYPE, AND LAMP TERMINALS SHALL BE OF THE PIERCED SPADE TYPE. TERMINALS SHALL BE SUITABLE FOR SOLDERING.
     - (2) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - a. MANUFACTURER'S NAME OR SYMBOL
       - b. MANUFACTURER'S ASSEMBLY PART NUMBER
       - c. LAMP CIRCUIT DIAGRAM
       - d. SWITCH CALL-OUT (1,2,ETC.)(FIGURE II)
       - e. TERMINAL NUMBERING (FIGURE II)
         NC, C, NO FOR SWITCHES
         A, B, C, D, G, FOR LAMPS
     - (3) PHYSICAL CAPTIVITY: LAMP AND LENS ASSEMBLY SHALL BE PHYSICALLY CAPTIVE BY MEANS OF A FLEXIBLE HINGE ASSEMBLY.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) SWITCHING ACTION: PER TABLE 1 THRU 5 AND FIGURE 1 THRU 4 AND TABLE C.
     - (2) COLOR BACKGROUND: PER TABLE 1 AND FIGURE 10
     - (3) DIELECTRIC STRENGTH: UNIT SHALL WITHSTAND 1000 VRMS 60 CPS APPLIED FOR ONE MINUTE BETWEEN MUTUALLY INSULATED PARTS, AND INSULATED PARTS AND GROUND. THERE SHALL BE NO EVIDENCE OF ARCING, BREAKDOWN OR DAMAGE.
     - (4) INSULATION RESISTANCE: SHALL BE 100 MEGOHMS MINIMUM WHEN MEASURED WITH 100 VDC BETWEEN ALL MUTUALLY INSULATED POINTS



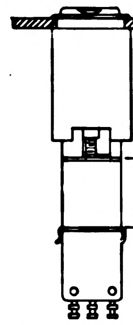
INDICATOR
FIGURE 1



4 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 3

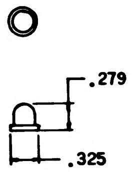


2 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 2



ADD .875±.031 TO OVERALL LENGTH WHEN HOLDING COIL IS REQUIRED

HOLDING COIL ADDITION
FIGURE 4



COLORED BULB BOOT
FIGURE 5

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO 99974
SIZE D
NASA DRAWING NO 1897337
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SHEET 2 OF 9

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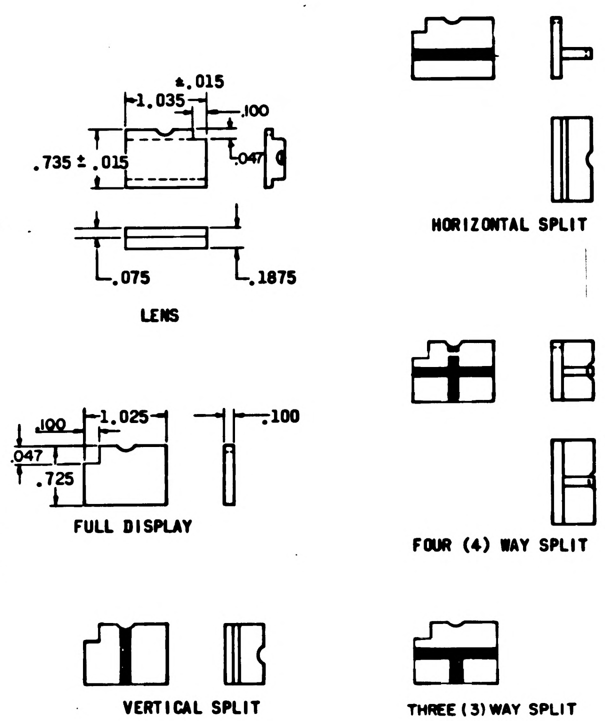
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP

3. DESIGN REQUIREMENTS:
   - A. SWITCH CONTACTS: SHALL BE FINE SILVER, SILVER ALLOY OR SILVER PLATED BRASS.
   - B. SWITCH CONTACT RATING:

RATED LOAD	30V DC	125/250V AC
RESISTIVE	5.0 AMPS	5.0 AMPS
INDUCTIVE	3.0 AMPS	5.0 AMPS

   - C. FRONT LENS STYLE: PER TABLE 1 THRU 5 AND FIGURE 6 AND TABLE 8.
   - D. LEGEND: SHALL BE .120 HIGH WITH .015 STROKE WIDTH. LETTERS AS SPECIFIED IN TABLE SHALL BE REVERSE ENGRAVED ON BACK SIDE OF LENS AND THEN FILLED WITH BLACK INK. EACH LINE OF LETTERS SHALL BE CENTERED ON THE LENS.
   - E. LAMPS: THIS UNIT SHALL BE SUPPLIED WITH MS-25237-327 LAMPS, FOUR (4) PER UNIT, UNLESS OTHERWISE STATED IN TABLE 1 THRU TABLE 5.
   - F. GROUND CIRCUIT: SHALL BE SINGLE GROUND UNLESS OTHERWISE NOTED AS ISOLATED DUAL GROUNDS.
   - G. BOOT: SHALL BE AS SHOWN IN FIGURE 5 AND REFERENCED IN TABLE A AND TABLE 1 THRU 5.
   - H. MOUNTING COVER: SHALL BE AS SHOWN IN FIGURE 7. (SEE ALSO ASSEMBLY & MOUNTING)
   - J. INDICATOR CLIP: SHALL BE POSITIONED ON THE SHAFT AS SHOWN IN FIGURE 9. (INDICATOR ONLY - TABLE 1)
   - K. MAGNETIC HOLDING COIL: MAGNETIC HOLDING COIL IS AVAILABLE AT 28 VDC ON ALL MOMENTARY ACTION MODELS. SEE FIGURE 4.
     - (1) HOLDING COIL RESISTANCE: 435 OHMS ±10% AT +25°C
     - (2) HOLD-IN VOLTAGE: 18 VOLTS DC MINIMUM AT +25°C.
     - (3) MAXIMUM OVERLOAD VOLTAGE: 32 VOLTS DC.
   - L. LIFE: 25,000 OPERATIONS MINIMUM AT RATED LOAD.
   - M. ENVIRONMENTAL REQUIREMENTS:
     THESE UNITS SHALL MEET ALL THE FUNCTIONAL REQUIREMENTS, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTS WHEN TESTED PER THE PROCEDURES OF MIL-E-5272.
     - (1) VIBRATION: 10 TO 500 CPS, 10 G.
     - (2) SHOCK: 20 G FOR 10 MILLISECONDS
     - (3) TEMPERATURE: 71°C MAX. FOR 48 HOURS WITH ALL 4 LAMPS ILLUMINATED.


±.015
1.035
.100
.735 ± .015
.047
.075
.1875
.100
1.025
.100
.047
.725

LENS

FULL DISPLAY

VERTICAL SPLIT

HORIZONTAL SPLIT

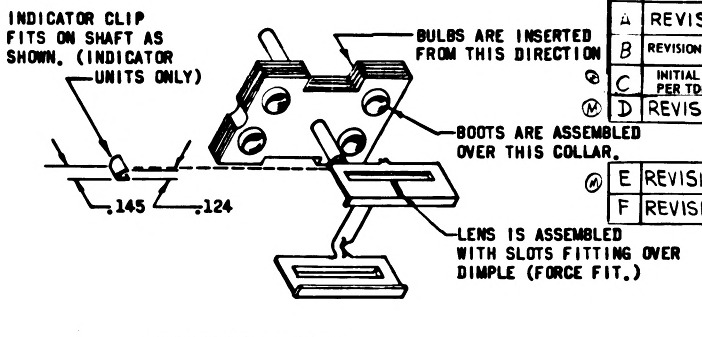
FOUR (4) WAY SPLIT

THREE (3) WAY SPLIT -26 OF TABLE B

DIFFUSER

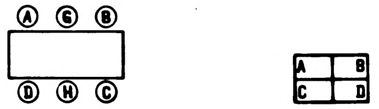
LENS ASSEMBLY (2 PIECES)

FIGURE 6


INDICATOR CLIP FITS ON SHAFT AS SHOWN. (INDICATOR UNITS ONLY)
BULBS ARE INSERTED FROM THIS DIRECTION
BOOTS ARE ASSEMBLED OVER THIS COLLAR.
.145
.124
LENS IS ASSEMBLED WITH SLOTS FITTING OVER DIMPLE (FORCE FIT.)

LAMP MODULE ASSEMBLY

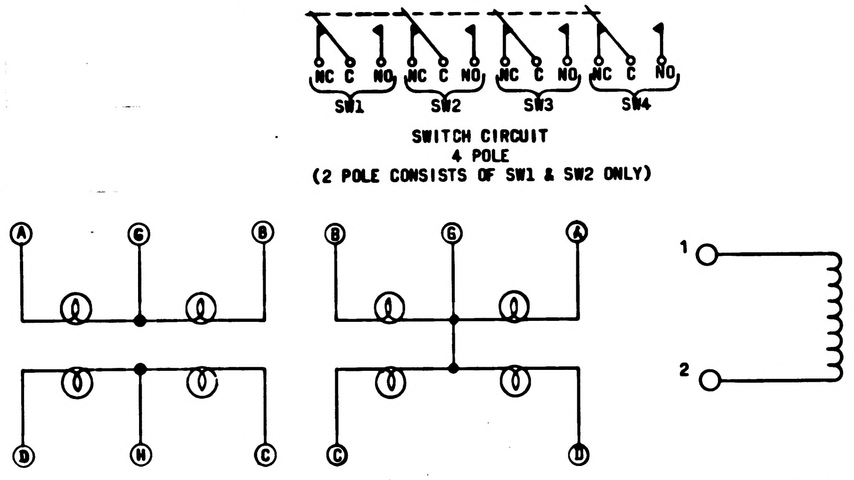
FIGURE 9


A
G
B
D
H
C
A
B
C
D

LAMP TERMINALS
(TERMINAL H DOES NOT APPEAR ON SINGLE GROUND UNITS)

LENS COLOR DISPLAY
FIGURE 10

FIGURE 10
(VIEWS FROM FRONT OF ASSEMBLY)


NC C NO
SW1
SW2
SW3
SW4
A
G
B
D
H
C
B
G
A
C
D
1
2

SWITCH CIRCUIT
4 POLE
(2 POLE CONSISTS OF SW1 & SW2 ONLY)

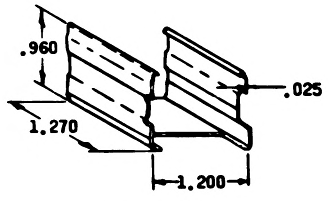
LAMP CIRCUIT
(ISOLATED DUAL GROUNDS)

LAMP CIRCUIT
(SINGLE GROUND)

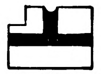
HOLDING COIL CIRCUIT

ALL CIRCUITS ARE INDEPENDANT OF EACH OTHER UNLESS OTHERWISE STATED

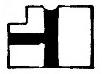
SCHEMATIC DIAGRAMS
(FOR REFERENCE ONLY)
FIGURE 11


.960
.025
1.270
1.200

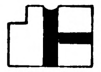
MOUNTING COVER
FIGURE 7



THREE (3) WAY SPLIT
-25 OF TABLE B



THREE (3) WAY SPLIT
-27 OF TABLE B

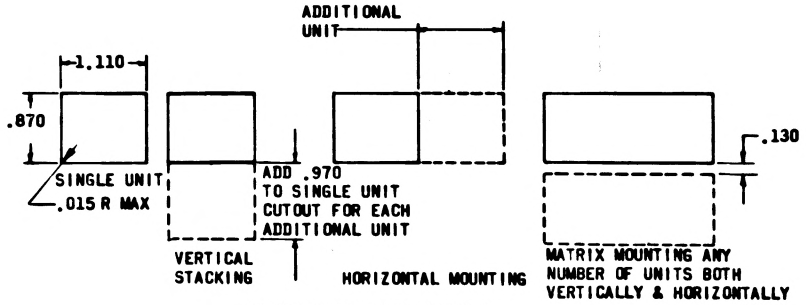


THREE (3) WAY SPLIT
-28 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)

FIGURE 6 CONTINUED


ADD 1.210 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
1.110
.870
SINGLE UNIT
.015 R MAX
ADD .970 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
VERTICAL STACKING
HORIZONTAL MOUNTING
.130
MATRIX MOUNTING ANY NUMBER OF UNITS BOTH VERTICALLY & HORIZONTALLY

RECOMMENDED PANEL CUTOUTS

FIGURE 8

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE —
WT
SHEET 3 OF 9

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A	REVISION STATUS CHANGED	[illegible]	[illegible]
B	REVISION STATUS CHANGED	30 SEP 65	B.
Ⓟ C	INITIAL RELEASE CLASS A PER TDRR 23416	8 OCT 65	REW
Ⓜ D	REVISION STATUS CHANGED	30 NOV 65	RLP
ⓜ E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP

TABLE A, B & C FOR SPARES

TABLE A - COLORED BOOTS (FIGURE 5)

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	COLOR
-10	10-R	RED
-11	10-G	GREEN
-12	10-A	AMBER
-13	10-W	WHITE
-14	10-515	INDICATOR CLIP (SEE FIG.9)

NOTE: WHITE COLOR IS PRODUCED WITH LIGHT BLUE BOOTS

TABLE B - LENS ASSEMBLY (FIGURE 6)

SPARE LEGEND PLATES ARE TO BE ORDERED PER THE MANUFACTURER'S PART NUMBERS LISTED IN TABLE 1 THRU 6

DIFFUSER

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	STYLE
-21	10-1	FULL DISPLAY
-22	10-2	HORIZONTALLY SPLIT DISPLAY
-23	10-3	VERTICALLY SPLIT DISPLAY
-24	10-5	FOUR (4) WAY SPLIT
-25	10-21	3 WAY SPLIT
-26	10-22	3 WAY SPLIT
-27	10-31	3 WAY SPLIT
-28	10-32	3 WAY SPLIT

TABLE C - SWITCHES

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	SWITCHING ACTION
-31	10-7	2 POLE MOMENTARY
-32	10-8	4 POLE MOMENTARY
-33	10-9	2 POLE ALTERNATE
-34	10-11	4 POLE ALTERNATE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. LEGEND CALLOUT IS DEFINED AS FOLLOWS:
   - a) A COMMA (,) IS USED TO SEPARATE LEGEND LINES
   - b) A SLASH (/) IS USED TO SEPARATE LEGENDS IN SPLIT DISPLAYS
   - c) A SHORT NARROW SLASH (/) IS USED ONLY AS A CHARACTER IN THE LEGEND.

EXAMPLE

G/N VOLTAGE PUSH RESET	
HIGH	LOW

G/N VOLTAGE, PUSH RESET/HIGH/LOW

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

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SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	[illegible] 65	[illegible]
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP

TABLE I
INDICATOR ONLY (FIGURE 1)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-101	P10-C3-1-W-X-0-E	10-4-14 G&N ON, (PTC, INHIBITED)	FULL DISPLAY	W	W	W	W		-201	10-4-14 G&N ON, (PTC, INHIBITED)

THE PART NUMBER IS THE DRAWING NUMBER
PLUS THE APPLICABLE DASH NUMBER.

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LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

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NASA DRAWING NO. 1897337
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TABLE 2

INDICATOR LIGHT - SWITCH ASSEMBLY
TWO POLE MOMENTARY ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	MAGNETIC HOLDING COIL	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURERS LEGEND PART NUMBER
-301	P10-A1-2-W-X-7-E	10-4-16 READ MODE/SET MODE	HORIZONTAL SPLIT	NO	W	W	W	W		-401	10-4-16 READ MODE/SET MODE
-302	↑	↑ MON COARSE/MON FINE	↑	↑	↑	↑	↑	↑		-402	↑ MON COARSE/MON FINE
-303		I G SELECT/SET ENABLE								-403	I G SELECT/SET ENABLE
-304		M G SELECT/SET ENABLE								-404	M G SELECT/SET ENABLE
-305		O G SELECT/SET ENABLE								-405	O G SELECT/SET ENABLE
-306	↓	↓ SHAFT SELECT/SET ENABLE	↓	↓	↓	↓	↓	↓		-406	↓ SHAFT SELECT/SET ENABLE
-307	P10-A1-2-W-X-7-E	10-4-16 TRUN SELECT/SET ENABLE	HORIZONTAL SPLIT	NO	W	W	W	W		-407	10-4-16 TRUN SELECT/SET ENABLE
-308	P10-A1-1-W-X-7-E	10-4-13 PUSH TO, INITIATE	FULL DISPLAY	NO	W	W	W	W		-408	10-4-13 PUSH TO, INITIATE
-309	P10-A1-1-W-X-7-E	10-4-12 POWER ON	FULL DISPLAY	NO	W	W	W	W		-409	10-4-12 POWER ON
-310	P10-A1-1-W-X-7-E	10-4-13 RELAY, COMMAND	FULL DISPLAY	NO	W	W	W	W		-410	10-4-13 RELAY, COMMAND

REVISIONS 23416

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
Ⓜ D	REVISION STATUS CHANGED	30 NOV 65	RLP
Ⓜ E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP

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LIGHT-INDICATOR SWITCH ASSEMBLY
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SIZE D
NASA DRAWING NO. 1897337
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A	REVISED PER MXC 204913	10 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR [illegible]	8 OCT 65	WRB TC
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISED PER TDRR 24404	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP

TABLE 3
INDICATOR - LIGHT SWITCH ASSEMBLY
TWO POLE ALTERNATE ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-501	P10-A1-1-W-X-9-E	10-4-14 INHIBIT, COMPUTER, POWER FAIL	FULL DISPLAY	W	W	W	W		-601	10-4-14 INHIBIT, COMPUTER, POWER FAIL
-502	P10-A1-2-W-X-9-E	10-4-16 MON COARSE/MON FINE	HORIZONTAL SPLIT	W	W	W	W		-602	10-4-16 MON COARSE/MON FINE
-503	P10-A1-1-W-X-9-E	10-4-14 READ, RATE TABLE, INPUT	FULL DISPLAY	W	W	W	W		-603	10-4-14 READ, RATE TABLE, INPUT
-504	P10-A1-1-W-X-9-E	10-4-14 LORS, RATE TABLE, CONTROL	FULL DISPLAY	W	W	W	W		-604	10-4-14 LORS, RATE TABLE, CONTROL

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A	REVISION STATUS CHANGED		EF
B	REVISED PER MXC-205309	30-SEP-65	B.
C	INITIAL RELEASE CLASS A PER TDRR 2346	18 OCT 65	WRB
D	REVISED PER TDRR 24063	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP

TABLE 4
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE MOMENTARY ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		MAGNETIC HOLDING COIL (FIGURE 4)	FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-701	P10-B2-2-WG-X-8-E	10-4-16 CHARGING/FULL CHARGE	YES	HORIZONTAL SPLIT	W	W	G	G		-801	10-4-16 CHARGING/FULL CHARGE
-702	P10-A1-2-W-X-8-E	10-4-17 X BAR, INPUT/ X BAR, OUTPUT	NO	HORIZONTAL SPLIT	W	W	W	W		-802	10-4-17 X BAR, INPUT/ X BAR, OUTPUT

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LIGHT - INDICATOR SWITCH ASSEMBLY

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REVISIONS	23416		
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B. EF
Ⓟ C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB FE
Ⓜ D	REVISION STATUS CHANGED	30 NOV 65	RLP
Ⓜ E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP

TABLE 5
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE ALTERNATE ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-751	P10-A1-1-W-X-11-E	10-4-13 POWER, ON	FULL DISPLAY	W	W	W	W		-851	10-4-13 POWER, ON
-752	P10-A1-2-W-X-11-E	10-4-17 800 CPS, PH GEN/ 3200 CPS, PH GEN	HORIZONTAL SPLIT	W	W	W	W		-852	10-4-17 800 CPS, PH GEN/ 3200 CPS, PH GEN
-753	P10-A1-1-W-X-11-E	10-4-12 VOLTMETER	FULL DISPLAY	W	W	W	W		-853	10-4-12 VOLTMETER
-754	P10-A1-2-W-X-11-E	10-4-17 DIRECT, PULSES/ VARIABLE, PULSES	HORIZONTAL SPLIT	W	W	W	W		-854	10-4-17 DIRECT, PULSES/ VARIABLE, PULSES
-755	P10-A1-1-W-X-11-E	10-4-12 SCOPE	FULL DISPLAY	W	W	W	W		-855	10-4-12 SCOPE
-756	P10-A1-2-W-X-11-E	10-4-16 PH GEN CAL/ NORMAL	HORIZONTAL SPLIT	W	W	W	W		-856	10-4-16 PH GEN CAL/ NORMAL

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APPROVAL J. M. Watkin 10-20-65
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO
99974	D	1897337
SCALE ——	WT	SHEET 9 OF 9

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REVISIONS			
SYM	DESCRIPTION	DATE	APPD.
A	REVISION STATUS CHANGED		
B	REVISION STATUS CHANGED	30 SEP. 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
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G	REVISION STATUS CHANGED	4 FEB 66	RJJ

ASSEMBLY AND MOUNTING INSTRUCTIONS

RECOMMENDED PANEL CUT-OUTS ARE SHOWN IN FIGURE 8.

DISASSEMBLY OF LIGHT

1. USING FINGERNAIL SLOTS ON SIDES, PULL LENS ASSEMBLY OUT APPROXIMATELY 5/8".
2. ROTATE LENS ASSEMBLY 90°. (SEE FIGURE A)
3. PUSH LENS IN TO RELEASE TENSION ON INDEX KEYS AND THEN PULL COMPLETE ASSEMBLY OUT.
4. BULBS, COLORED BOOTS, LENS AND LEGENDS MAY NOW BE REMOVED SEPARATELY AS SHOWN IN FIGURE B.
5. SWITCH ASSEMBLY MAY BE REMOVED BY SIMPLY RELEASING SPRING CLIPS AS SHOWN IN FIGURE B.

INSTALLATION OF LIGHT

6. TO INSTALL LIGHT IN PANEL FIRST PERFORM STEPS 1, 2, AND 3 OF DISASSEMBLY OF LIGHT.
7. UNSCREW (2) SCREWS UNTIL THE CAPTIVE NUTS REACH THE REAR OF THEIR TRAVEL RANGE (SHOWN IN FIGURE C) AND REMOVE COVER.
8. INSERT LIGHT THROUGH PANEL CUTOUT FROM THE FRONT OF PANEL AS SHOWN IN FIGURE D.
9. FROM REAR OF PANEL, SLIP COVER OVER LIGHT UNTIL IT FITS SNUGLY AGAINST REAR OF PANEL.

    A. IF MOUNTING PANEL THICKNESS IS APPROX .125 OR LESS, COVER IS INSTALLED AS SHOWN IN FIGURE D: IF PANEL THICKNESS IS GREATER THAN .125 INSTALL COVER WITH OPPOSITE END FIRST.

10. TIGHTEN THE TWO SCREWS FROM FRONT OF PANEL.
11. INSERT COMPLETE FRONT END ASSEMBLY SO THAT BULB BOARD SLOT ALIGNS WITH BULBBOARD INDEX.
12. ROTATE LENS ASSEMBLY 90° SO THAT LENS AND LEGEND INDEX IS AT TOP OF LIGHT.
13. PUSH ASSEMBLY INTO LIGHT TO COMPLETE INSTALLATION.

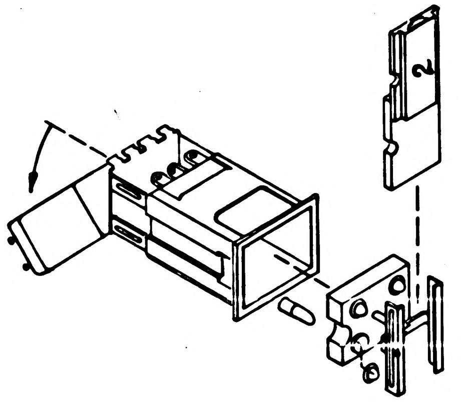

FIG. B

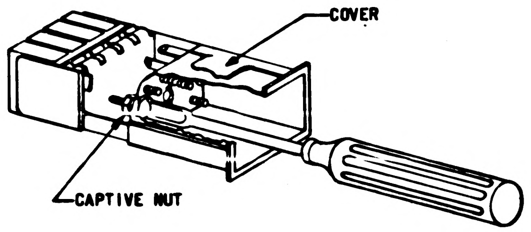

FIG. C

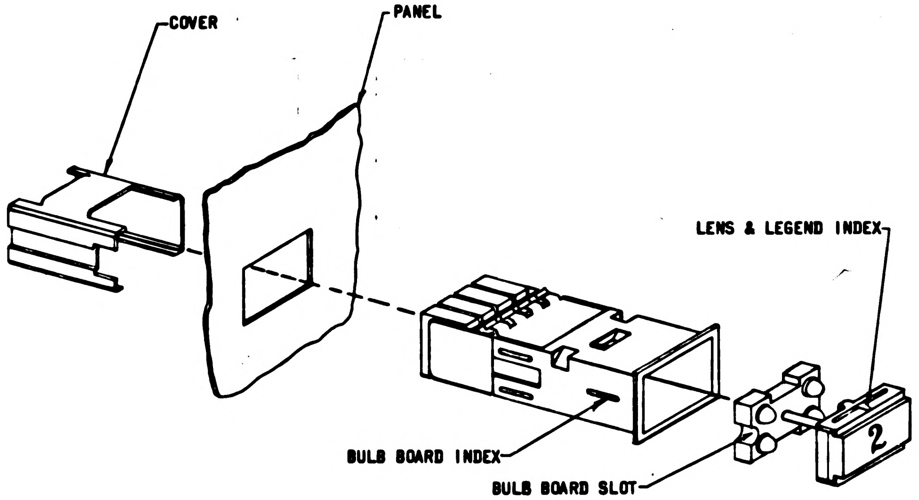

FIG. D

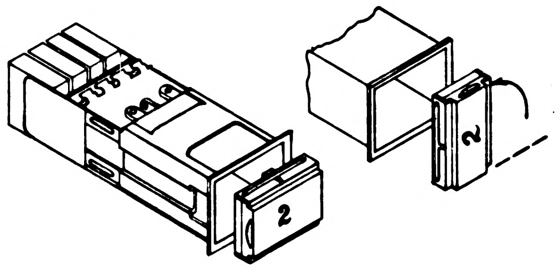

FIG. A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE D 1897337
SCALE — WT SHEET 1 OF 9

1897337 G

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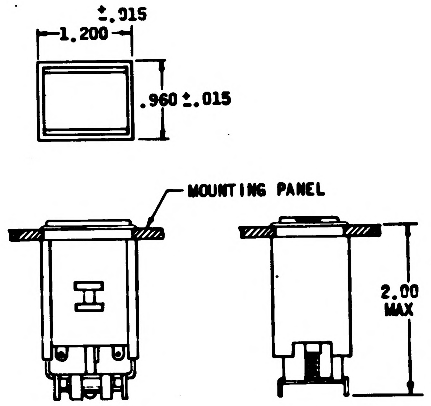
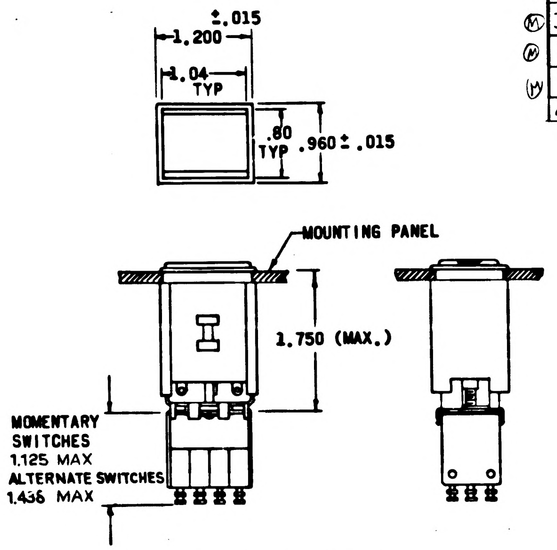
G	REVISION STATUS CHANGED	FEB 66	RJJ

REQUIREMENTS:

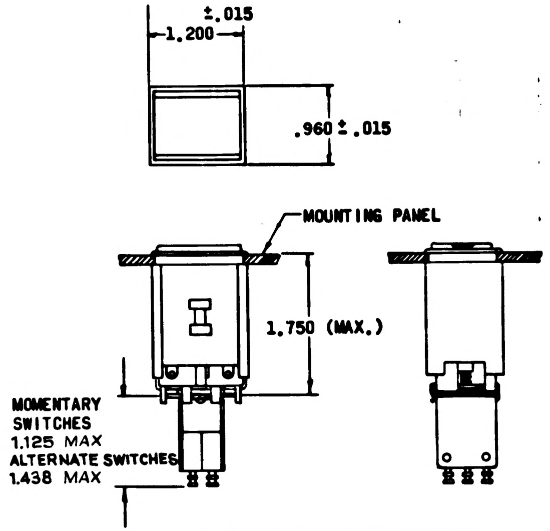
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINALS: SHALL ACCOMMODATE TWO(2) NUMBER 20 GAGE WIRES. SWITCH TERMINALS SHALL BE THE DOUBLE-TURRET TYPE, AND LAMP TERMINALS SHALL BE OF THE PIERCED SPADE TYPE. TERMINALS SHALL BE SUITABLE FOR SOLDERING.
     - (2) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - a. MANUFACTURER'S NAME OR SYMBOL
       - b. MANUFACTURER'S ASSEMBLY PART NUMBER
       - c. LAMP CIRCUIT DIAGRAM
       - d. SWITCH CALL-OUT (1,2,ETC.)(FIGURE 11)
       - e. TERMINAL NUMBERING (FIGURE 11)
         NC, C, NO FOR SWITCHES
         A, B, C, D, G, FOR LAMPS
     - (3) PHYSICAL CAPTIVITY: LAMP AND LENS ASSEMBLY SHALL BE PHYSICALLY CAPTIVE BY MEANS OF A FLEXIBLE HINGE ASSEMBLY.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) SWITCHING ACTION: PER TABLE 1 THRU 5 AND FIGURE 1 THRU 4 AND TABLE C.
     - (2) COLOR BACKGROUND: PER TABLE 1 AND FIGURE 10
     - (3) DIELECTRIC STRENGTH: UNIT SHALL WITHSTAND 1000 VRMS 60 CPS APPLIED FOR ONE MINUTE BETWEEN MUTUALLY INSULATED PARTS, AND INSULATED PARTS AND GROUND. THERE SHALL BE NO EVIDENCE OF ARCING, BREAKDOWN OR DAMAGE.
     - (4) INSULATION RESISTANCE: SHALL BE 100 MEGOHMS MINIMUM WHEN MEASURED WITH 100 VDC BETWEEN ALL MUTUALLY INSULATED POINTS



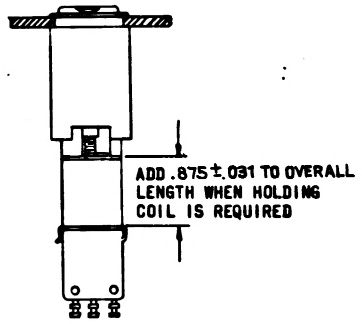
INDICATOR
FIGURE 1



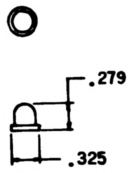
4 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 3



2 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 2


ADD .875 ± .031 TO OVERALL LENGTH WHEN HOLDING COIL IS REQUIRED

HOLDING COIL ADDITION
FIGURE 4



COLORED BULB BOOT
FIGURE 5

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

1897337 G

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LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
WT
SHEET 2 OF 9

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3. DESIGN REQUIREMENTS:

A. SWITCH CONTACTS: SHALL BE FINE SILVER, SILVER ALLOY OR SILVER PLATED BRASS.

B. SWITCH CONTACT RATING:

RATED LOAD	30V DC	125/250V AC
RESISTIVE	5.0 AMPS	5.0 AMPS
INDUCTIVE	3.0 AMPS	5.0 AMPS

C. FRONT LENS STYLE: PER TABLE 1 THRU 5 AND FIGURE 6 AND TABLE 8.

D. LEGEND: SHALL BE .120 HIGH WITH .015 STROKE WIDTH. LETTERS AS SPECIFIED IN TABLE SHALL BE REVERSE ENGRAVED ON BACK SIDE OF LENS AND THEN FILLED WITH BLACK INK. EACH LINE OF LETTERS SHALL BE CENTERED ON THE LENS.

E. LAMPS: THIS UNIT SHALL BE SUPPLIED WITH MS-25237-327 LAMPS, FOUR (4) PER UNIT, UNLESS OTHERWISE STATED IN TABLE 1 THRU TABLE 5.

F. GROUND CIRCUIT: SHALL BE SINGLE GROUND UNLESS OTHERWISE NOTED AS ISOLATED DUAL GROUNDS.

G. BOOT: SHALL BE AS SHOWN IN FIGURE 5 AND REFERENCED IN TABLE A AND TABLE 1 THRU 5.

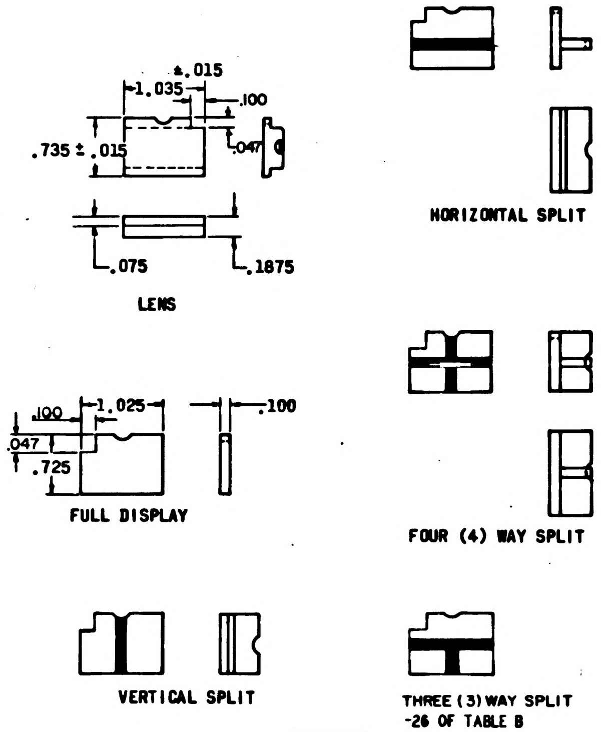
H. MOUNTING COVER: SHALL BE AS SHOWN IN FIGURE 7. (SEE ALSO ASSEMBLY & MOUNTING)

J. INDICATOR CLIP: SHALL BE POSITIONED ON THE SHAFT AS SHOWN IN FIGURE 9. (INDICATOR ONLY - TABLE 1)

K. MAGNETIC HOLDING COIL: MAGNETIC HOLDING COIL IS AVAILABLE AT 28 VDC ON ALL MOMENTARY ACTION MODELS. SEE FIGURE 4.
(1) HOLDING COIL RESISTANCE: 435 OHMS ± 10%. AT + 25°C
(2) HOLD-IN VOLTAGE: 18 VOLTS DC MINIMUM AT + 25°C.
(3) MAXIMUM OVERLOAD VOLTAGE: 32 VOLTS DC.

L. LIFE: 25,000 OPERATIONS MINIMUM AT RATED LOAD.

M. ENVIRONMENTAL REQUIREMENTS:
THESE UNITS SHALL MEET ALL THE FUNCTIONAL REQUIREMENTS, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTS WHEN TESTED PER THE PROCEDURES OF MIL-E-5272.
(1) VIBRATION: 10 TO 500 CPS, 10 G.
(2) SHOCK: 20 G FOR 10 MILLISECONDS
(3) TEMPERATURE: 71°C MAX. FOR 48 HOURS WITH ALL 4 LAMPS ILLUMINATED.


±.015
1.035
.100
.735 ± .015
.047
.075
.1875
.100
1.025
.047
.725
.100

LENS

FULL DISPLAY

HORIZONTAL SPLIT

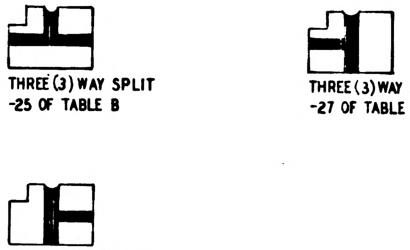
FOUR (4) WAY SPLIT

VERTICAL SPLIT

THREE (3) WAY SPLIT -26 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6



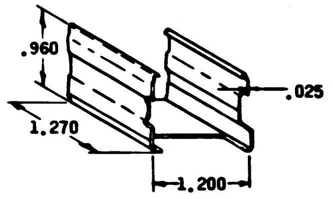
THREE (3) WAY SPLIT -25 OF TABLE B

THREE (3) WAY SPLIT -27 OF TABLE B

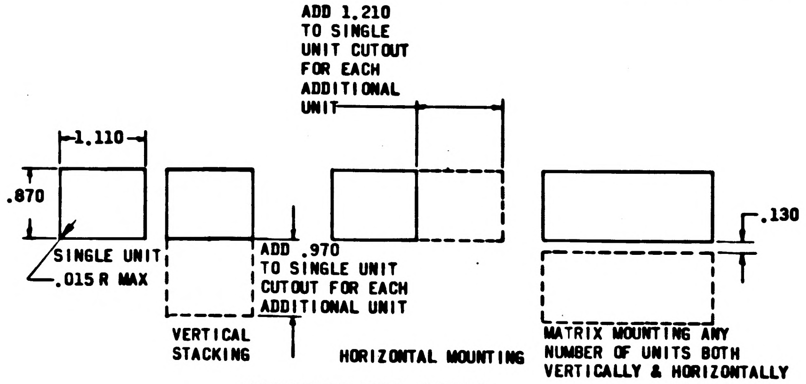
THREE (3) WAY SPLIT -28 OF TABLE B

DIFFUSER

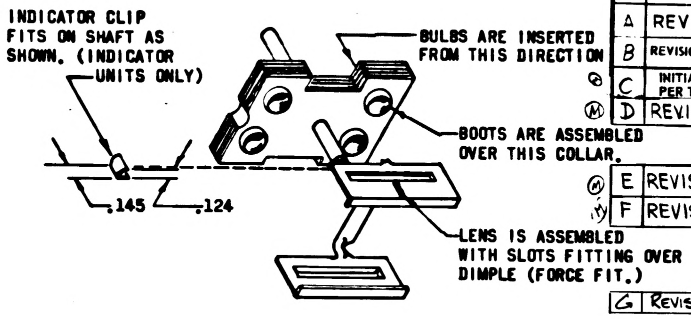
LENS ASSEMBLY (2 PIECES)
FIGURE 6 CONTINUED


.960
.025
1.270
1.200

MOUNTING COVER
FIGURE 7


ADD 1.210 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
1.110
.870
SINGLE UNIT
.015 R MAX
ADD .970 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
.130
VERTICAL STACKING
HORIZONTAL MOUNTING
MATRIX MOUNTING ANY NUMBER OF UNITS BOTH VERTICALLY & HORIZONTALLY

RECOMMENDED PANEL CUTOUTS
FIGURE 8


INDICATOR CLIP FITS ON SHAFT AS SHOWN. (INDICATOR UNITS ONLY)
BULBS ARE INSERTED FROM THIS DIRECTION
BOOTS ARE ASSEMBLED OVER THIS COLLAR.
LENS IS ASSEMBLED WITH SLOTS FITTING OVER DIMPLE (FORCE FIT.)
.145
.124

LAMP MODULE ASSEMBLY
FIGURE 9

REVISIONS			
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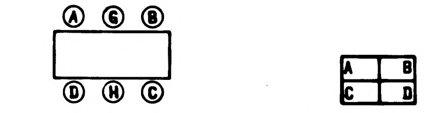
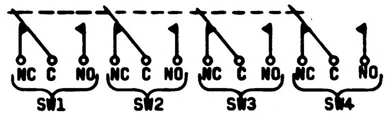

A
G
B
D
H
C
A
B
C
D

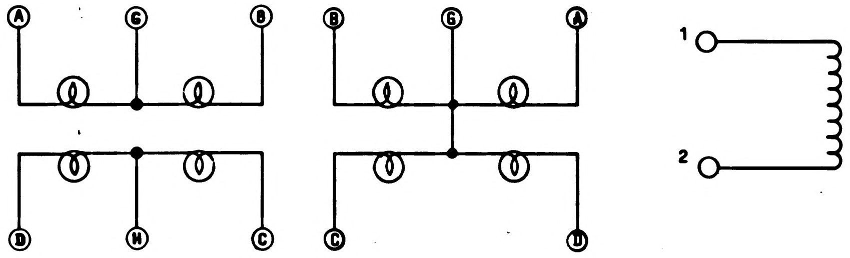
LAMP TERMINALS
(TERMINAL H DOES NOT APPEAR ON SINGLE GROUND UNITS)

LENS COLOR DISPLAY
FIGURE 10

FIGURE 10
(VIEWS FROM FRONT OF ASSEMBLY)


NC
C
NO
SW1
SW2
SW3
SW4

SWITCH CIRCUIT
4 POLE
(2 POLE CONSISTS OF SW1 & SW2 ONLY)


A
G
B
D
H
C
B
G
A
C
D
1
2

LAMP CIRCUIT
(ISOLATED DUAL GROUNDS)

LAMP CIRCUIT
(SINGLE GROUND)

HOLDING COIL CIRCUIT

ALL CIRCUITS ARE INDEPENDANT OF EACH OTHER UNLESS OTHERWISE STATED

SCHEMATIC DIAGRAMS
(FOR REFERENCE ONLY)
FIGURE 11

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TABLE A, B & C FOR SPARES

TABLE A - COLORED BOOTS (FIGURE 5)

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	COLOR
-10	10-R	RED
-11	10-G	GREEN
-12	10-A	AMBER
-13	10-W	WHITE
-14	10-515	INDICATOR CLIP(SEE FIG.9)

NOTE: WHITE COLOR IS PRODUCED WITH LIGHT BLUE BOOTS

TABLE B - LENS ASSEMBLY (FIGURE 6)

SPARE LEGEND PLATES ARE TO BE ORDERED PER THE MANUFACTURER'S PART NUMBERS LISTED IN TABLE 1 THRU 6

DIFFUSER

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	STYLE
-21	10-1	FULL DISPLAY
-22	10-2	HORIZONTALLY SPLIT DISPLAY
-23	10-3	VERTICALLY SPLIT DISPLAY
-24	10-5	FOUR (4) WAY SPLIT
-25	10-21	3 WAY SPLIT
-26	10-22	3 WAY SPLIT
-27	10-31	3 WAY SPLIT
-28	10-32	3 WAY SPLIT

TABLE C - SWITCHES

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	SWITCHING ACTION
-31	10-7	2 POLE MOMENTARY
-32	10-8	4 POLE MOMENTARY
-33	10-9	2 POLE ALTERNATE
-34	10-11	4 POLE ALTERNATE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. LEGEND CALLOUT IS DEFINED AS FOLLOWS:
   a) A COMMA (,) IS USED TO SEPARATE LEGEND LINES
   b) A SLASH (/) IS USED TO SEPARATE LEGENDS IN SPLIT DISPLAYS.
   c) A SHORT NARROW SLASH (/) IS USED ONLY AS A CHARACTER IN THE LEGEND.

EXAMPLE

G/N VOLTAGE PUSH RESET	
HIGH	LOW

G/N VOLTAGE, PUSH RESET/HIGH/LOW

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HEAT TREATMENT
SEE REQUIREMENTS

FINAL FINISH
SEE REQUIREMENTS

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LIGHT-INDICATOR SWITCH ASSEMBLY

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REVISIONS

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A	REVISION STATUS CHANGED		
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISED PER TDRR 25573	4 FEB 66	RJJ

TABLE I
INDICATOR ONLY (FIGURE 1)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-101	P10-C3-1-W-X-0-E	10-4-14 G&N ON, (PTC, INHIBITED)	FULL DISPLAY	W	W	W	W		-201	10-4-14 G&N ON, (PTC, INHIBITED)
-102	P10-C3-1-W-X-0-E	10-4-14 LORS, TEST, CONFIG	FULL DISPLAY	W	W	W	W		-202	10-4-14 LORS, TEST, CONFIG

1897337 G

THE PART NUMBER IS THE DRAWING NUMBER
PLUS THE APPLICABLE DASH NUMBER.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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HOUSTON, TEXAS

LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	D	1897337

SCALE —— WT SHEET 5 OF 9

NOTICE — WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

REVISIONS 3416			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ

TABLE 2
INDICATOR LIGHT - SWITCH ASSEMBLY
TWO POLE MOMENTARY ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	MAGNETIC HOLDING COIL	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURERS LEGEND PART NUMBER
-301	P10-A1-2-W-X-7-E	10-4-16 READ MODE/SET MODE	HORIZONTAL SPLIT	NO	W	W	W	W		-401	10-4-16 READ MODE/SET MODE
-302	↑	↑ MON COARSE/MON FINE	↑	↑	↑	↑	↑	↑		-402	↑ MON COARSE/MON FINE
-303	│	│ I G SELECT/SET ENABLE	│	│	│	│	│	│		-403	│ I G SELECT/SET ENABLE
-304	│	│ M G SELECT/SET ENABLE	│	│	│	│	│	│		-404	│ M G SELECT/SET ENABLE
-305	│	│ O G SELECT/SET ENABLE	│	│	│	│	│	│		-405	│ O G SELECT/SET ENABLE
-306	↓	↓ SHAFT SELECT/SET ENABLE	↓	↓	↓	↓	↓	↓		-406	↓ SHAFT SELECT/SET ENABLE
-307	P10-A1-2-W-X-7-E	10-4-16 TRUN SELECT/SET ENABLE	HORIZONTAL SPLIT	NO	W	W	W	W		-407	10-4-16 TRUN SELECT/SET ENABLE
-308	P10-A1-1-W-X-7-E	10-4-13 PUSH TO, INITIATE	FULL DISPLAY	NO	W	W	W	W		-408	10-4-13 PUSH TO, INITIATE
-309	P10-A1-1-W-X-7-E	10-4-12 POWER ON	FULL DISPLAY	NO	W	W	W	W		-409	10-4-12 POWER ON
-310	P10-A1-1-W-X-7-E	10-4-13 RELAY, COMMAND	FULL DISPLAY	NO	W	W	W	W		-410	10-4-13 RELAY, COMMAND

1897337 G

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	D	1897337
SCALE	WT	SHEET 6 OF 9

NOTICE - WHEN GOVERNMENT DRAWINGS SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO

TABLE 3
INDICATOR - LIGHT SWITCH ASSEMBLY
TWO POLE ALTERNATE ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D	
-501	P10-A1-1-W-X-9-E	10-4-14 INHIBIT, COMPUTER, POWER FAIL	FULL DISPLAY	W	W	W	W	
-502	P10-A1-2-W-X-9-E	10-4-16 MON COARSE/MON FINE	HORIZONTAL SPLIT	W	W	W	W	
-503	P10-A1-1-W-X-9-E	10-4-14 READ, RATE TABLE, INPUT	FULL DISPLAY	W	W	W	W	
-504	P10-A1-1-W-X-9-E	10-4-14 LORS, RATE TABLE, CONTROL	FULL DISPLAY	W	W	W	W	

LENS ASSEMBLY (LEGEND PLATES ONLY)

NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-601	10-4-14 INHIBIT, COMPUTER, POWER FAIL
-602	10-4-16 MON COARSE/MON FINE
-603	10-4-14 READ, RATE TABLE, INPUT
-604	10-4-14 LORS, RATE TABLE, CONTROL

REVISIONS

SYM	DESCRIPTION	DATE	APPD
A	REVISED PER MXC 204913	SEP 65	
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 3416	8 OCT 65	WSB
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISED PER TDRR 24404	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJU

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LIST OF MATERIALS

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
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SHEET 7 OF 9

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SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED		EF
B	REVISED PER MXC-205309	30-SEP-65	B.
C	INITIAL RELEASE CLASS A PER TDRR 2346	18 OCT 65	WRB
D	REVISED PER TDRR 24063	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP
G	REVISION STATUS CHANGED	FEB 66	RJJ

TABLE 4
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE MOMENTARY ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		MAGNETIC HOLDING COIL (FIGURE 4)	FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-701	P10-B2-2-WG-X-8-E	10-4-16 CHARGING/FULL CHARGE	YES	HORIZONTAL SPLIT	W	W	G	G		-801	10-4-16 CHARGING/FULL CHARGE
-702	P10-A1-2-W-X-8-E	10-4-17 X BAR, INPUT/ X BAR, OUTPUT	NO	HORIZONTAL SPLIT	W	W	W	W		-802	10-4-17 X BAR, INPUT/ X BAR, OUTPUT

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
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NASA DRAWING NO 1897337
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SHEET 8 OF 9

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REVISIONS 23416			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B. EF
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ

TABLE 5
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE ALTERNATE ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-751	P10-A1-1-W-X-11-E	10-4-13 POWER, ON	FULL DISPLAY	W	W	W	W		-851	10-4-13 POWER, ON
-752	P10-A1-2-W-X-11-E	10-4-17 800 CPS, PH GEN/ 3200 CPS, PH GEN	HORIZONTAL SPLIT	W	W	W	W		-852	10-4-17 800 CPS, PH GEN/ 3200 CPS, PH GEN
-753	P10-A1-1-W-X-11-E	10-4-12 VOLTMETER	FULL DISPLAY	W	W	W	W		-853	10-4-12 VOLTMETER
-754	P10-A1-2-W-X-11-E	10-4-17 DIRECT, PULSES/ VARIABLE, PULSES	HORIZONTAL SPLIT	W	W	W	W		-854	10-4-17 DIRECT, PULSES/ VARIABLE, PULSES
-755	P10-A1-1-W-X-11-E	10-4-12 SCOPE	FULL DISPLAY	W	W	W	W		-855	10-4-12 SCOPE
-756	P10-A1-2-W-X-11-E	10-4-16 PH GEN CAL/ NORMAL	HORIZONTAL SPLIT	W	W	W	W		-856	10-4-16 PH GEN CAL/ NORMAL

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

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SIZE D
NASA DRAWING NO 1897337
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SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	15 SEP 65	[illegible]
B	REVISION STATUS CHANGED	30 SEP. 65	JB.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	OKD

ASSEMBLY AND MOUNTING INSTRUCTIONS

RECOMMENDED PANEL CUT-OUTS ARE SHOWN IN FIGURE 8.

DISASSEMBLY OF LIGHT

1. USING FINGERNAIL SLOTS ON SIDES, PULL LENS ASSEMBLY OUT APPROXIMATELY 5/8".
2. ROTATE LENS ASSEMBLY 90°. (SEE FIGURE A)
3. PUSH LENS IN TO RELEASE TENSION ON INDEX KEYS AND THEN PULL COMPLETE ASSEMBLY OUT.
4. BULBS, COLORED BOOTS, LENS AND LEGENDS MAY NOW BE REMOVED SEPARATELY AS SHOWN IN FIGURE B.
5. SWITCH ASSEMBLY MAY BE REMOVED BY SIMPLY RELEASING SPRING CLIPS AS SHOWN IN FIGURE B.

INSTALLATION OF LIGHT

6. TO INSTALL LIGHT IN PANEL FIRST PERFORM STEPS 1, 2, AND 3 OF DISASSEMBLY OF LIGHT.
7. UNSCREW (2) SCREWS UNTIL THE CAPTIVE NUTS REACH THE REAR OF THEIR TRAVEL RANGE (SHOWN IN FIGURE C) AND REMOVE COVER.
8. INSERT LIGHT THROUGH PANEL CUTOUT FROM THE FRONT OF PANEL AS SHOWN IN FIGURE D.
9. FROM REAR OF PANEL, SLIP COVER OVER LIGHT UNTIL IT FITS SNUGLY AGAINST REAR OF PANEL.

   A. IF MOUNTING PANEL THICKNESS IS APPROX .125 OR LESS, COVER IS INSTALLED AS SHOWN IN FIGURE D: IF PANEL THICKNESS IS GREATER THAN .125 INSTALL COVER WITH OPPOSITE END FIRST.

10. TIGHTEN THE TWO SCREWS FROM FRONT OF PANEL.
11. INSERT COMPLETE FRONT END ASSEMBLY SO THAT BULB BOARD SLOT ALIGNS WITH BULBBOARD INDEX.
12. ROTATE LENS ASSEMBLY 90° SO THAT LENS AND LEGEND INDEX IS AT TOP OF LIGHT.
13. PUSH ASSEMBLY INTO LIGHT TO COMPLETE INSTALLATION.

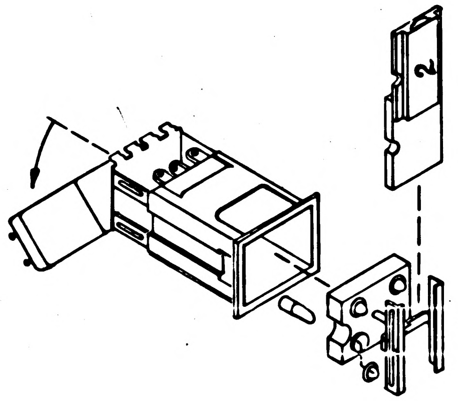

FIG. B

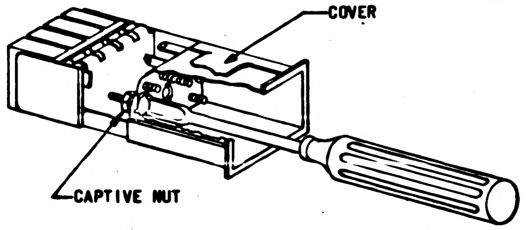

FIG. C

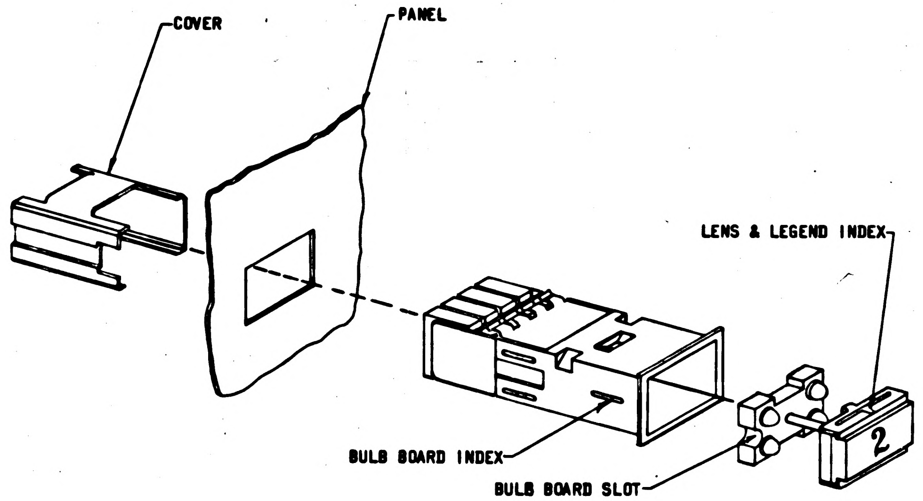

FIG. D

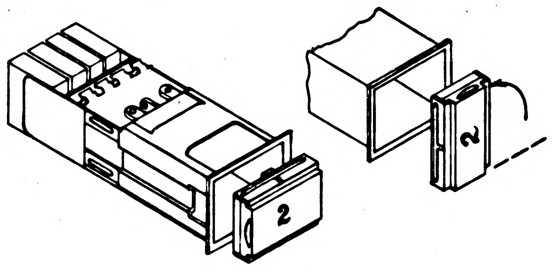

FIG. A

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
99974	D	1897337

SCALE —— WT SHEET 1 OF 9

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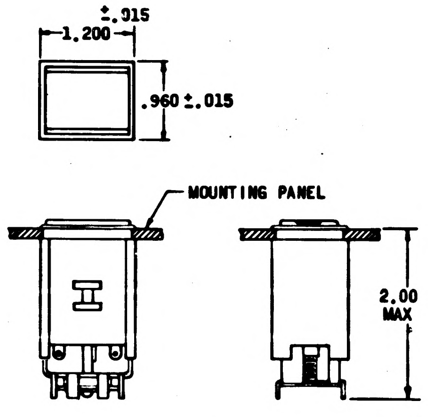
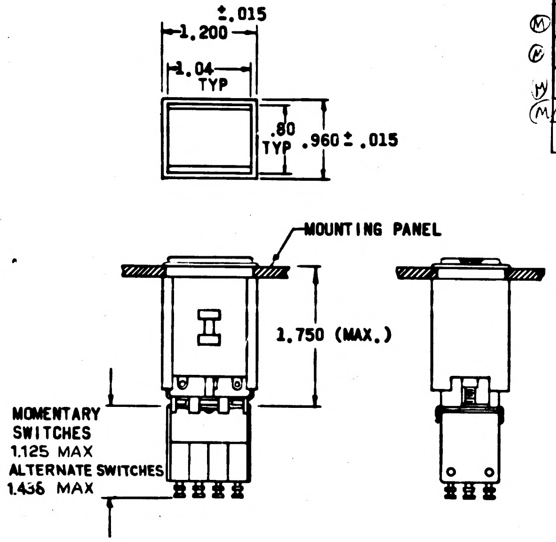
REVISIONS 3416			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED		
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 3416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	DKD

REQUIREMENTS:

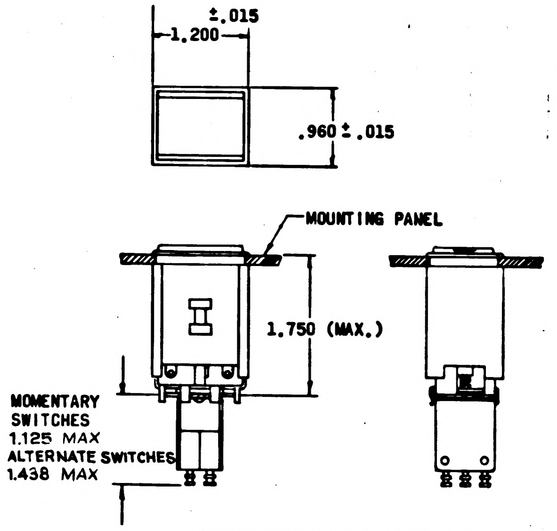
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINALS: SHALL ACCOMMODATE TWO (2) NUMBER 20 GAGE WIRES. SWITCH TERMINALS SHALL BE THE DOUBLE-TURRET TYPE, AND LAMP TERMINALS SHALL BE OF THE PIERCED SPADE TYPE. TERMINALS SHALL BE SUITABLE FOR SOLDERING.
     - (2) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - a. MANUFACTURER'S NAME OR SYMBOL
       - b. MANUFACTURER'S ASSEMBLY PART NUMBER
       - c. LAMP CIRCUIT DIAGRAM
       - d. SWITCH CALL-OUT (1, 2, ETC.) (FIGURE 11)
       - e. TERMINAL NUMBERING (FIGURE 11)
         NC, C, NO FOR SWITCHES
         A, B, C, D, G, FOR LAMPS
     - (3) PHYSICAL CAPTIVITY: LAMP AND LENS ASSEMBLY SHALL BE PHYSICALLY CAPTIVE BY MEANS OF A FLEXIBLE HINGE ASSEMBLY.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) SWITCHING ACTION: PER TABLE 1 THRU 5 AND FIGURE 1 THRU 4 AND TABLE C.
     - (2) COLOR BACKGROUND: PER TABLE 1 AND FIGURE 10
     - (3) DIELECTRIC STRENGTH: UNIT SHALL WITHSTAND 1000 VRMS 60 CPS APPLIED FOR ONE MINUTE BETWEEN MUTUALLY INSULATED PARTS, AND INSULATED PARTS AND GROUND. THERE SHALL BE NO EVIDENCE OF ARCING, BREAKDOWN OR DAMAGE.
     - (4) INSULATION RESISTANCE: SHALL BE 100 MEGOHMS MINIMUM WHEN MEASURED WITH 100 VDC BETWEEN ALL MUTUALLY INSULATED POINTS



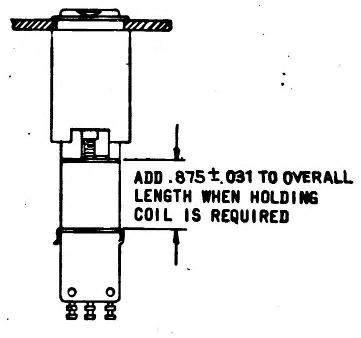
INDICATOR
FIGURE 1



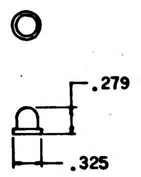
4 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 3



2 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 2


ADD .875 ±.031 TO OVERALL LENGTH WHEN HOLDING COIL IS REQUIRED

HOLDING COIL ADDITION
FIGURE 4



COLORED BULB BOOT
FIGURE 5

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

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LIST OF MATERIALS

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
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SHEET 2 OF 9

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REVISIONS 3			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	14 SEP 65	CF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJU
H	REVISION STATUS CHANGED	16 FEB 66	DKD

3. DESIGN REQUIREMENTS:

A. SWITCH CONTACTS: SHALL BE FINE SILVER, SILVER ALLOY OR SILVER PLATED BRASS.

B. SWITCH CONTACT RATING:

RATED LOAD	30V DC	125/250V AC
RESISTIVE	5.0 AMPS	5.0 AMPS
INDUCTIVE	3.0 AMPS	5.0 AMPS

C. FRONT LENS STYLE: PER TABLE 1 THRU 5 AND FIGURE 6 AND TABLE 8.

D. LEGEND: SHALL BE .120 HIGH WITH .015 STROKE WIDTH. LETTERS AS SPECIFIED IN TABLE SHALL BE REVERSE ENGRAVED ON BACK SIDE OF LENS AND THEN FILLED WITH BLACK INK. EACH LINE OF LETTERS SHALL BE CENTERED ON THE LENS.

E. LAMPS: THIS UNIT SHALL BE SUPPLIED WITH MS-25237-327 LAMPS, FOUR (4) PER UNIT, UNLESS OTHERWISE STATED IN TABLE 1 THRU TABLE 5.

F. GROUND CIRCUIT: SHALL BE SINGLE GROUND UNLESS OTHERWISE NOTED AS ISOLATED DUAL GROUNDS.

G. BOOT: SHALL BE AS SHOWN IN FIGURE 5 AND REFERENCED IN TABLE A AND TABLE 1 THRU 5.

H. MOUNTING COVER: SHALL BE AS SHOWN IN FIGURE 7. (SEE ALSO ASSEMBLY & MOUNTING)

J. INDICATOR CLIP: SHALL BE POSITIONED ON THE SHAFT AS SHOWN IN FIGURE 9. (INDICATOR ONLY - TABLE 1)

K. MAGNETIC HOLDING COIL: MAGNETIC HOLDING COIL IS AVAILABLE AT 28 VDC ON ALL MOMENTARY ACTION MODELS. SEE FIGURE 4.

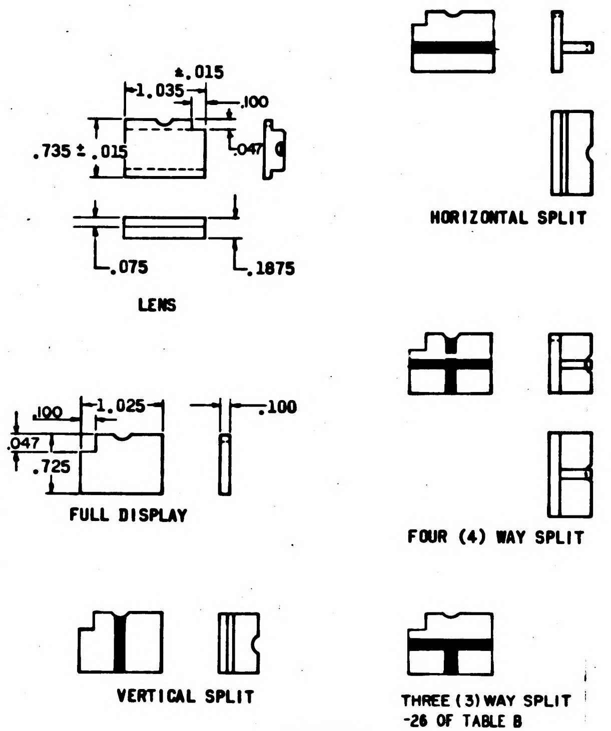
(1) HOLDING COIL RESISTANCE: 435 OHMS ±10% AT +25°C
(2) HOLD-IN VOLTAGE: 18 VOLTS DC MINIMUM AT +25°C.
(3) MAXIMUM OVERLOAD VOLTAGE: 32 VOLTS DC.

L. LIFE: 25,000 OPERATIONS MINIMUM AT RATED LOAD.

M. ENVIRONMENTAL REQUIREMENTS:

THESE UNITS SHALL MEET ALL THE FUNCTIONAL REQUIREMENTS, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTS WHEN TESTED PER THE PROCEDURES OF MIL-E-5272.

(1) VIBRATION: 10 TO 500 CPS, 10 G.
(2) SHOCK: 20 G FOR 10 MILLISECONDS
(3) TEMPERATURE: 71°C MAX. FOR 48 HOURS WITH ALL 4 LAMPS ILLUMINATED.


±.015
1.035
.100
.735 ± .015
.047
.075
.1875
.100
1.025
.100
.047
.725
.100

LENS

FULL DISPLAY

HORIZONTAL SPLIT

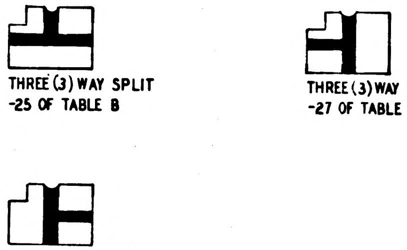
FOUR (4) WAY SPLIT

VERTICAL SPLIT

THREE (3) WAY SPLIT -26 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6



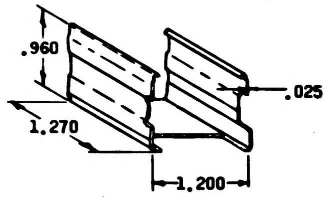
THREE (3) WAY SPLIT -25 OF TABLE B

THREE (3) WAY SPLIT -27 OF TABLE B

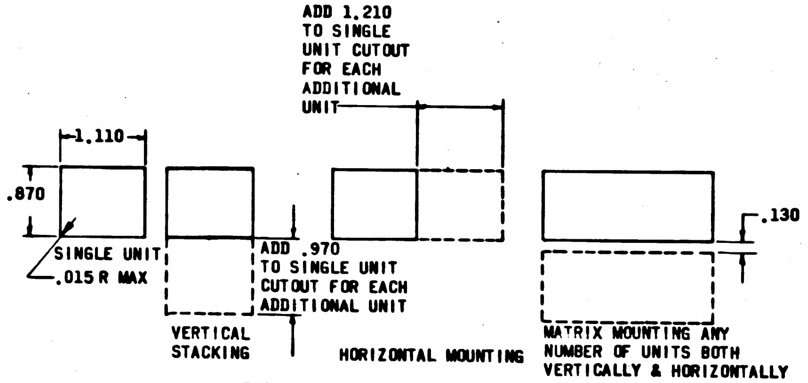
THREE (3) WAY SPLIT -28 OF TABLE B

DIFFUSER

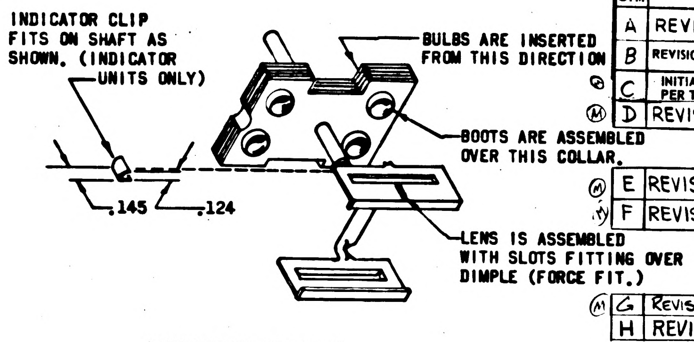
LENS ASSEMBLY (2 PIECES)
FIGURE 6 CONTINUED


.960
.025
1.270
1.200

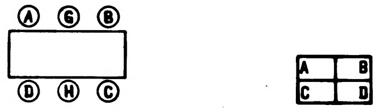
MOUNTING COVER
FIGURE 7


ADD 1.210 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
1.110
.870
SINGLE UNIT
.015 R MAX
ADD .970 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
.130
VERTICAL STACKING
HORIZONTAL MOUNTING
MATRIX MOUNTING ANY NUMBER OF UNITS BOTH VERTICALLY & HORIZONTALLY

RECOMMENDED PANEL CUTOUTS
FIGURE 8


INDICATOR CLIP FITS ON SHAFT AS SHOWN. (INDICATOR UNITS ONLY)
.145
.124
BULBS ARE INSERTED FROM THIS DIRECTION
BOOTS ARE ASSEMBLED OVER THIS COLLAR.
LENS IS ASSEMBLED WITH SLOTS FITTING OVER DIMPLE (FORCE FIT.)

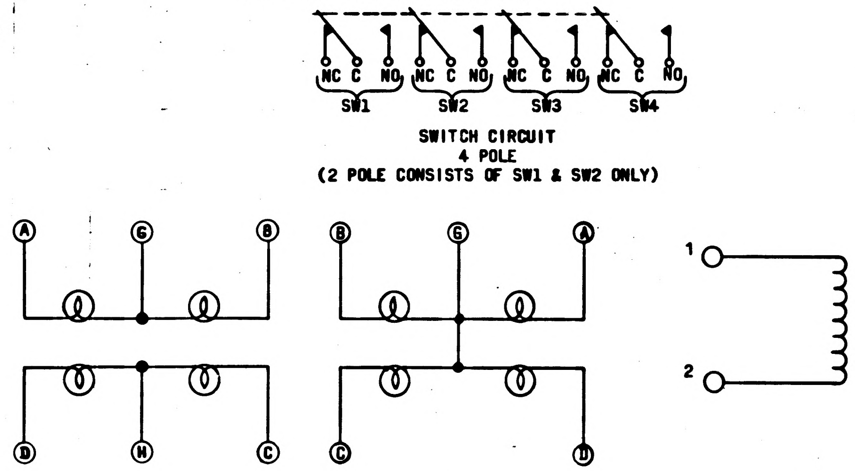
LAMP MODULE ASSEMBLY
FIGURE 9


A
G
B
D
H
C
A
B
C
D

LAMP TERMINALS
(TERMINAL H DOES NOT APPEAR ON SINGLE GROUND UNITS)

LENS COLOR DISPLAY
FIGURE 10

FIGURE 10
(VIEWS FROM FRONT OF ASSEMBLY)


NC C NO
NC C NO
NC C NO
NC C NO
SW1
SW2
SW3
SW4
A
G
B
D
H
C
B
G
A
C
D
1
2

SWITCH CIRCUIT
4 POLE
(2 POLE CONSISTS OF SW1 & SW2 ONLY)

LAMP CIRCUIT
(ISOLATED DUAL GROUNDS)

LAMP CIRCUIT
(SINGLE GROUND)

HOLDING COIL CIRCUIT

ALL CIRCUITS ARE INDEPENDANT OF EACH OTHER UNLESS OTHERWISE STATED

SCHEMATIC DIAGRAMS
(FOR REFERENCE ONLY)
FIGURE 11

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
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NASA DRAWING NO. 1897337
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SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	[illegible]
B	REVISION STATUS CHANGED	30 SEP 65	B.
Ⓟ C	INITIAL RELEASE CLASS A PER TDRR 23412	8 OCT 65	REW
Ⓜ D	REVISION STATUS CHANGED	30 NOV 65	RLP
Ⓜ E	REVISION STATUS CHANGED	3 DEC 65	RLP
Ⓥ F	REVISION STATUS CHANGED	18 JAN 66	RLP
Ⓐ G	REVISION STATUS CHANGED	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	OKD

TABLE A, B & C FOR SPARES

TABLE A - COLORED BOOTS (FIGURE 5)

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	COLOR
-10	10-R	RED
-11	10-G	GREEN
-12	10-A	AMBER
-13	10-W	WHITE
-14	10-515	INDICATOR CLIP (SEE FIG. 9)

NOTE: WHITE COLOR IS PRODUCED WITH LIGHT BLUE BOOTS

TABLE B - LENS ASSEMBLY (FIGURE 6)

SPARE LEGEND PLATES ARE TO BE ORDERED PER THE MANUFACTURER'S PART NUMBERS LISTED IN TABLE 1 THRU 6

DIFFUSER

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	STYLE
-21	10-1	FULL DISPLAY
-22	10-2	HORIZONTALLY SPLIT DISPLAY
-23	10-3	VERTICALLY SPLIT DISPLAY
-24	10-5	FOUR (4) WAY SPLIT
-25	10-21	3 WAY SPLIT
-26	10-22	3 WAY SPLIT
-27	10-31	3 WAY SPLIT
-28	10-32	3 WAY SPLIT

TABLE C - SWITCHES

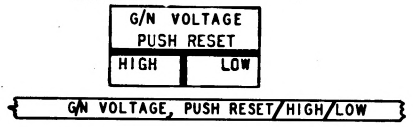
DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	SWITCHING ACTION
-31	10-7	2 POLE MOMENTARY
-32	10-8	4 POLE MOMENTARY
-33	10-9	2 POLE ALTERNATE
-34	10-11	4 POLE ALTERNATE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. LEGEND CALLOUT IS DEFINED AS FOLLOWS:
   - a) A COMMA (,) IS USED TO SEPARATE LEGEND LINES
   - b) A SLASH (/) IS USED TO SEPARATE LEGENDS IN SPLIT DISPLAYS.
   - c) A SHORT NARROW SLASH (/) IS USED ONLY AS A CHARACTER IN THE LEGEND.

EXAMPLE



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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

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TABLE I
INDICATOR ONLY (FIGURE 1)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-101	P10-C3-1-W-X-0-E	10-4-14 G&N ON, (PTC, INHIBITED)	FULL DISPLAY	W	W	W	W		-201	10-4-14 G&N ON, (PTC, INHIBITED)
-102	P10-C3-1-W-X-0-E	10-4-14 LORS, TEST, CONFIG	FULL DISPLAY	W	W	W	W		-202	10-4-14 LORS, TEST, CONFIG

REVISIONS 234

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	[illegible]
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISED PER TDRR 25573	4 FEB 66	RJJ
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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

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TABLE 2
INDICATOR LIGHT - SWITCH ASSEMBLY
TWO POLE MOMENTARY ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	MAGNETIC HOLDING COIL	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURERS LEGEND PART NUMBER
-301	P10-A1-2-W-X-7-E	10-4-16 READ MODE/SET MODE	HORIZONTAL SPLIT	NO	W	W	W	W		-401	10-4-16 READ MODE/SET MODE
-302	↑	↑ MON COARSE/MON FINE	↑	↑	↑	↑	↑	↑		-402	↑ MON COARSE/MON FINE
-303		I G SELECT/SET ENABLE								-403	I G SELECT/SET ENABLE
-304		M G SELECT/SET ENABLE								-404	M G SELECT/SET ENABLE
-305		O G SELECT/SET ENABLE								-405	O G SELECT/SET ENABLE
-306	↓	↓ SHAFT SELECT/SET ENABLE	↓	↓	↓	↓	↓	↓		-406	↓ SHAFT SELECT/SET ENABLE
-307	P10-A1-2-W-X-7-E	10-4-16 TRUN SELECT/SET ENABLE	HORIZONTAL SPLIT	NO	W	W	W	W		-407	10-4-16 TRUN SELECT/SET ENABLE
-308	P10-A1-1-W-X-7-E	10-4-13 PUSH TO, INITIATE	FULL DISPLAY	NO	W	W	W	W		-408	10-4-13 PUSH TO, INITIATE
-309	P10-A1-1-W-X-7-E	10-4-12 POWER ON	FULL DISPLAY	NO	W	W	W	W		-409	10-4-12 POWER ON
-310	P10-A1-1-W-X-7-E	10-4-13 RELAY, COMMAND	FULL DISPLAY	NO	W	W	W	W		-410	10-4-13 RELAY, COMMAND

REVISIONS -34116

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B. EF
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
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F	REVISED PER TDRR 25294	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	DKD

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
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TABLE 3
INDICATOR - LIGHT SWITCH ASSEMBLY
TWO POLE ALTERNATE ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-501	P10-A1-1-W-X-9-E	10-4-14 INHIBIT, COMPUTER, POWER FAIL	FULL DISPLAY	W	W	W	W		-601	10-4-14 INHIBIT, COMPUTER, POWER FAIL
-502	P10-A1-2-W-X-9-E	10-4-16 MON COARSE/MON FINE	HORIZONTAL SPLIT	W	W	W	W		-602	10-4-16 MON COARSE/MON FINE
-503	P10-A1-1-W-X-9-E	10-4-14 READ, RATE TABLE, INPUT	FULL DISPLAY	W	W	W	W		-603	10-4-14 READ, RATE TABLE, INPUT
-504	P10-A1-1-W-X-9-E	10-4-14 LORS, RATE TABLE, CONTROL	FULL DISPLAY	W	W	W	W		-604	10-4-14 LORS, RATE TABLE, CONTROL

REVISIONS 3-1/4

SYM	DESCRIPTION	DATE	APPD
A	REVISED PER MXC 204913	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 3416	8 OCT 65	WRB JC
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISED PER TDRR 24404	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	DKD

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
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SHEET 7 OF 9

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REVISIONS ≈34/6			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED		EF
B	REVISED PER MXC-205309	30-SEP-65	B.
C	INITIAL RELEASE CLASS A PER TDRR 2346	18 OCT 65	WRB
D	REVISED PER TDRR 24063	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP
G	REVISION STATUS CHANGED	FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	DKD

TABLE 4
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE MOMENTARY ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		MAGNETIC HOLDING COIL (FIGURE 4)	FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-701	P10-B2-2-WG-X-8-E	10-4-16 CHARGING/FULL CHARGE	YES	HORIZONTAL SPLIT	W	W	G	G		-801	10-4-16 CHARGING/FULL CHARGE
-702	P10-A1-2-W-X-8-E	10-4-17 X BAR, INPUT/ X BAR, OUTPUT	NO	HORIZONTAL SPLIT	W	W	W	W		-802	10-4-17 X BAR, INPUT/ X BAR, OUTPUT

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NASA DRAWING NO. 1897337
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REVISIONS	23416		
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISION STATUS CHANGED	16 SEP 65	EF
B	REVISION STATUS CHANGED	30 SEP 65	B. EF
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJS
H	REVISED PER TDRR 26081	16 FEB 66	DKD

TABLE 5
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE ALTERNATE ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-751	P10-A1-1-W-X-11-E	10-4-13 POWER, ON	FULL DISPLAY	W	W	W	W		-851	10-4-13 POWER, ON
-752	P10-A1-2-W-X-11-E	10-4-17 800 CPS, PH GEN / 3200 CPS, PH GEN	HORIZONTAL SPLIT	W	W	W	W		-852	10-4-17 800 CPS, PH GEN / 3200 CPS, PH GEN
-753	P10-A1-1-W-X-11-E	10-4-12 VOLTMETER	FULL DISPLAY	W	W	W	W		-853	10-4-12 VOLTMETER
-754	P10-A1-2-W-X-11-E	10-4-17 DIRECT, PULSES / VARIABLE, PULSES	HORIZONTAL SPLIT	W	W	W	W		-854	10-4-17 DIRECT, PULSES / VARIABLE, PULSES
-755	P10-A1-1-W-X-11-E	10-4-12 SCOPE	FULL DISPLAY	W	W	W	W		-855	10-4-12 SCOPE
-756	P10-A1-2-W-X-11-E	10-4-16 PH GEN CAL / NORMAL	HORIZONTAL SPLIT	W	W	W	W		-856	10-4-16 PH GEN CAL / NORMAL
-757	P10-A1-2-W-X-11-E	10-4-17 800~ EXC #1, VARIABLE / 800~ EXC #1, FIXED	HORIZONTAL SPLIT	W	W	W	W		-857	10-4-17 800~ EXC #1, VARIABLE / 800~ EXC #1, FIXED
-758	P10-A1-2-W-X-11-E	10-4-17 800~ EXC #2, VARIABLE / 800~ EXC #2, FIXED	HORIZONTAL SPLIT	W	W	W	W		-858	10-4-17 800~ EXC #2, VARIABLE / 800~ EXC #2, FIXED
-759	P10-A1-2-W-X-11-E	10-4-17 3200~ EXC, VARIABLE / 3200~ EXC, FIXED	HORIZONTAL SPLIT	W	W	W	W		-859	10-4-17 3200~ EXC, VARIABLE / 3200~ EXC, FIXED

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
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NASA DRAWING NO. 1897337
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ASSEMBLY AND MOUNTING INSTRUCTIONS

RECOMMENDED PANEL CUT-OUTS ARE SHOWN IN FIGURE B.

DISASSEMBLY OF LIGHT

1. USING FINGERNAIL SLOTS ON SIDES, PULL LENS ASSEMBLY OUT APPROXIMATELY 5/8".
2. ROTATE LENS ASSEMBLY 90°. (SEE FIGURE A)
3. PUSH LENS IN TO RELEASE TENSION ON INDEX KEYS AND THEN PULL COMPLETE ASSEMBLY OUT.
4. BULBS, COLORED BOOTS, LENS AND LEGENDS MAY NOW BE REMOVED SEPARATELY AS SHOWN IN FIGURE B.
5. SWITCH ASSEMBLY MAY BE REMOVED BY SIMPLY RELEASING SPRING CLIPS AS SHOWN IN FIGURE B.

INSTALLATION OF LIGHT

6. TO INSTALL LIGHT IN PANEL FIRST PERFORM STEPS 1, 2, AND 3 OF DISASSEMBLY OF LIGHT.
7. UNSCREW (2) SCREWS UNTIL THE CAPTIVE NUTS REACH THE REAR OF THEIR TRAVEL RANGE (SHOWN IN FIGURE C) AND REMOVE COVER.
8. INSERT LIGHT THROUGH PANEL CUTOUT FROM THE FRONT OF PANEL AS SHOWN IN FIGURE D.
9. FROM REAR OF PANEL, SLIP COVER OVER LIGHT UNTIL IT FITS SNUGLY AGAINST REAR OF PANEL.

   A. IF MOUNTING PANEL THICKNESS IS APPROX .125 OR LESS, COVER IS INSTALLED AS SHOWN IN FIGURE D: IF PANEL THICKNESS IS GREATER THAN .125 INSTALL COVER WITH OPPOSITE END FIRST.

10. TIGHTEN THE TWO SCREWS FROM FRONT OF PANEL.
11. INSERT COMPLETE FRONT END ASSEMBLY SO THAT BULB BOARD SLOT ALIGNS WITH BULBBOARD INDEX.
12. ROTATE LENS ASSEMBLY 90° SO THAT LENS AND LEGEND INDEX IS AT TOP OF LIGHT.
13. PUSH ASSEMBLY INTO LIGHT TO COMPLETE INSTALLATION.

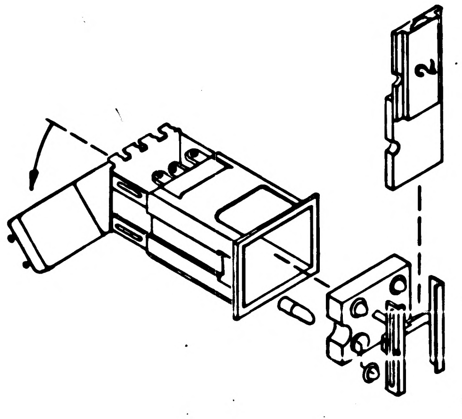

FIG. B

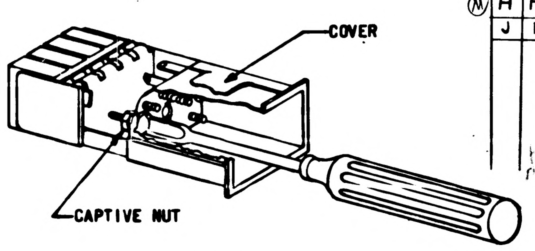

FIG. C

REVISIONS			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	15 SEP 65	
B	REVISION STATUS CHANGED	30 SEP 65	
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	DKD
J	REVISION STATUS CHANGED	24 MAY 66	RWB / CP

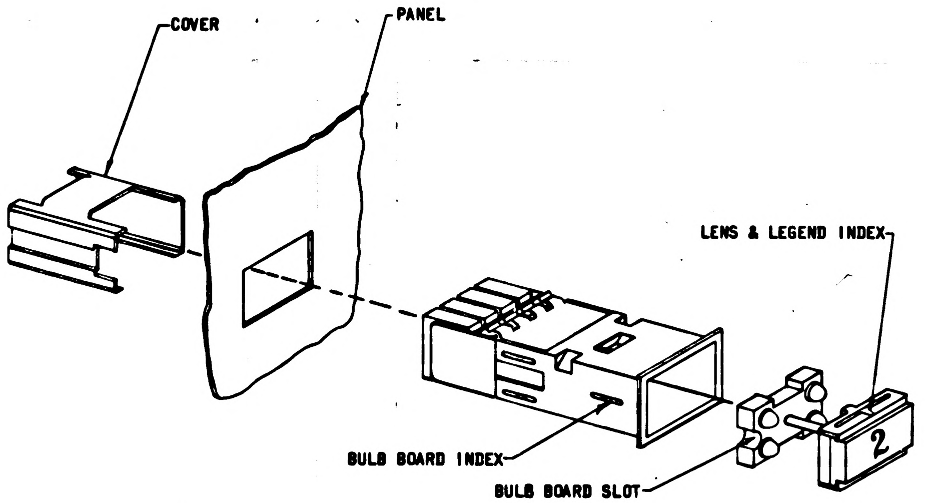

FIG. D

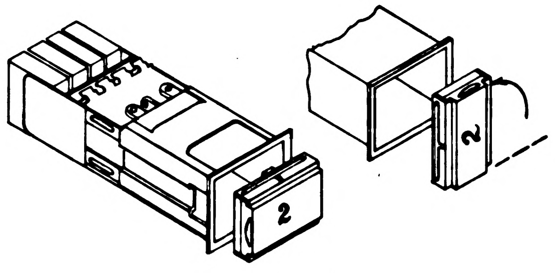

FIG. A

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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE D 1897337
SCALE — WT SHEET 1 OF 9

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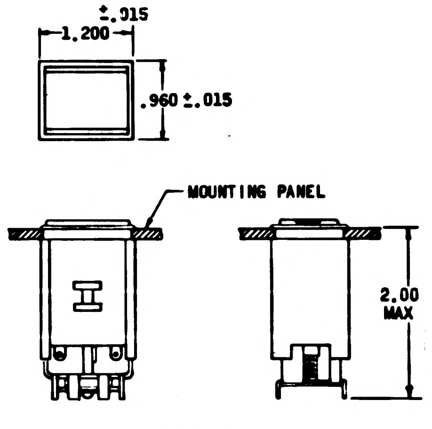
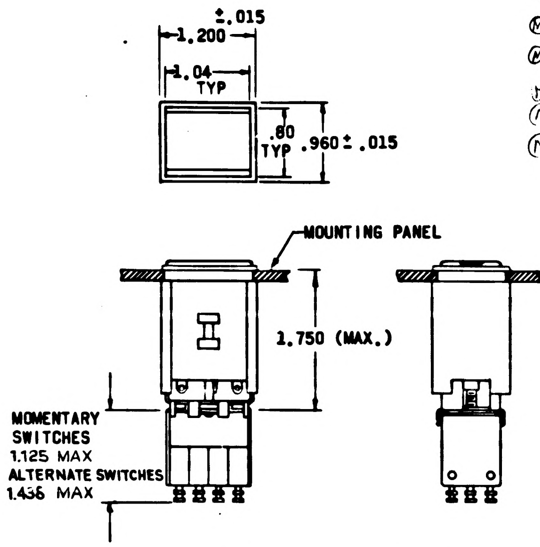
REQUIREMENTS:

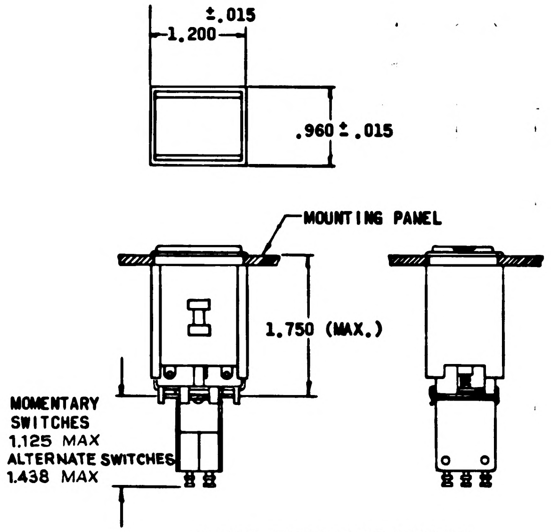
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINALS: SHALL ACCOMMODATE TWO(2) NUMBER 20 GAGE WIRES. SWITCH TERMINALS SHALL BE THE DOUBLE-TURRET TYPE, AND LAMP TERMINALS SHALL BE OF THE PIERCED SPADE TYPE. TERMINALS SHALL BE SUITABLE FOR SOLDERING.
     - (2) MARKING: UNIT SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE FOLLOWING:
       - a. MANUFACTURER'S NAME OR SYMBOL
       - b. MANUFACTURER'S ASSEMBLY PART NUMBER
       - c. LAMP CIRCUIT DIAGRAM
       - d. SWITCH CALL-OUT (1,2,ETC.)(FIGURE 11)
       - e. TERMINAL NUMBERING (FIGURE 11)
         NC, C, NO FOR SWITCHES
         A, B, C, D, G, FOR LAMPS
     - (3) PHYSICAL CAPTIVITY: LAMP AND LENS ASSEMBLY SHALL BE PHYSICALLY CAPTIVE BY MEANS OF A FLEXIBLE HINGE ASSEMBLY.
   - B. ELECTRICAL REQUIREMENTS:
     - (1) SWITCHING ACTION: PER TABLE 1 THRU 5 AND FIGURE 1 THRU 4 AND TABLE C.
     - (2) COLOR BACKGROUND: PER TABLE 1 AND FIGURE 10
     - (3) DIELECTRIC STRENGTH:
       UNIT SHALL WITHSTAND 1000 VRMS 60 CPS APPLIED FOR ONE MINUTE BETWEEN MUTUALLY INSULATED PARTS, AND INSULATED PARTS AND GROUND. THERE SHALL BE NO EVIDENCE OF ARCING, BREAKDOWN OR DAMAGE.
     - (4) INSULATION RESISTANCE:
       SHALL BE 100 MEGOHMS MINIMUM WHEN MEASURED WITH 100 VDC BETWEEN ALL MUTUALLY INSULATED POINTS



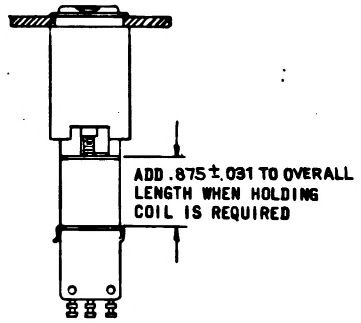
INDICATOR
FIGURE 1



4 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 3

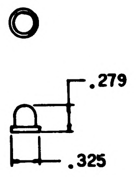


2 POLE SWITCH-LIGHT ASSEMBLY
FIGURE 2



ADD .875 ±.031 TO OVERALL LENGTH WHEN HOLDING COIL IS REQUIRED

HOLDING COIL ADDITION
FIGURE 4



COLORED BULB BOOT
FIGURE 5

REVISIONS 3.7

	SYM	DESCRIPTION	DATE	APP'D
	A	REVISION STATUS CHANGED	65	
	B	REVISION STATUS CHANGED	30 SEP 65	B.
Ⓜ	C	INITIAL RELEASE CLASS A PER TDRR 34166	18 OCT 65	REW
Ⓜ	D	REVISION STATUS CHANGED	30 NOV 65	RLP
Ⓜ	E	REVISION STATUS CHANGED	3 DEC 65	RLP
M	F	REVISION STATUS CHANGED	18 JAN 66	RLP
(M	G	REVISION STATUS CHANGED	4 FEB 66	RJJ
Ⓜ	H	REVISION STATUS CHANGED	16 FEB 66	DKD
	J	REVISION STATUS CHANGED	24 MAY 66	RGB / CP

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APPROVAL
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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO 99974
SIZE D
NASA DRAWING NO 1897337
SCALE ——
WT
SHEET 2 OF 9

1897337 J

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3. DESIGN REQUIREMENTS:

A. SWITCH CONTACTS: SHALL BE FINE SILVER, SILVER ALLOY OR SILVER PLATED BRASS.

B. SWITCH CONTACT RATING:

RATED LOAD	30V DC	125/250V AC
RESISTIVE	5.0 AMPS	5.0 AMPS
INDUCTIVE	3.0 AMPS	5.0 AMPS

C. FRONT LENS STYLE: PER TABLE 1 THRU 5 AND FIGURE 6 AND TABLE 8.

D. LEGEND: SHALL BE .120 HIGH WITH .015 STROKE WIDTH. LETTERS AS SPECIFIED IN TABLE SHALL BE REVERSE ENGRAVED ON BACK SIDE OF LENS AND THEN FILLED WITH BLACK INK. EACH LINE OF LETTERS SHALL BE CENTERED ON THE LENS.

E. LAMPS: THIS UNIT SHALL BE SUPPLIED WITH MS-25237-327 LAMPS, FOUR (4) PER UNIT, UNLESS OTHERWISE STATED IN TABLE 1 THRU TABLE 5.

F. GROUND CIRCUIT: SHALL BE SINGLE GROUND UNLESS OTHERWISE NOTED AS ISOLATED DUAL GROUNDS.

G. BOOT: SHALL BE AS SHOWN IN FIGURE 5 AND REFERENCED IN TABLE A AND TABLE 1 THRU 5.

H. MOUNTING COVER: SHALL BE AS SHOWN IN FIGURE 7. (SEE ALSO ASSEMBLY & MOUNTING)

J. INDICATOR CLIP: SHALL BE POSITIONED ON THE SHAFT AS SHOWN IN FIGURE 9. (INDICATOR ONLY - TABLE 1)

K. MAGNETIC HOLDING COIL: MAGNETIC HOLDING COIL IS AVAILABLE AT 28 VDC ON ALL MOMENTARY ACTION MODELS. SEE FIGURE 4.

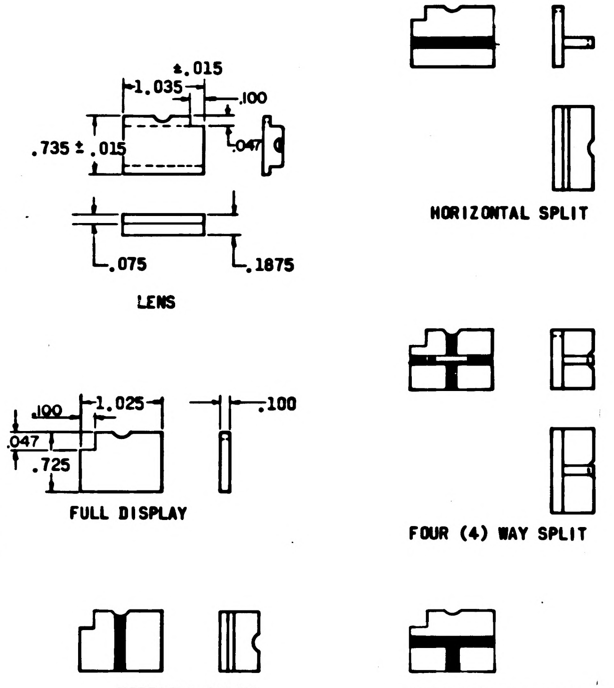
(1) HOLDING COIL RESISTANCE: 435 OHMS ±10%, AT +25°C
(2) HOLD-IN VOLTAGE: 18 VOLTS DC MINIMUM AT +25°C.
(3) MAXIMUM OVERLOAD VOLTAGE: 32 VOLTS DC.

L. LIFE: 25,000 OPERATIONS MINIMUM AT RATED LOAD.

M. ENVIRONMENTAL REQUIREMENTS:

THESE UNITS SHALL MEET ALL THE FUNCTIONAL REQUIREMENTS, BEFORE, DURING AND AFTER EXPOSURE TO THE FOLLOWING ENVIRONMENTS WHEN TESTED PER THE PROCEDURES OF MIL-E-5272.

(1) VIBRATION: 10 TO 500 CPS, 10 G.
(2) SHOCK: 20 G FOR 10 MILLISECONDS
(3) TEMPERATURE: 71°C MAX. FOR 48 HOURS WITH ALL 4 LAMPS ILLUMINATED.


±.015
1.035
.100
.735 ±.015
.047
.075
.1875
.100
1.025
.100
.047
.725

LENS

FULL DISPLAY

VERTICAL SPLIT

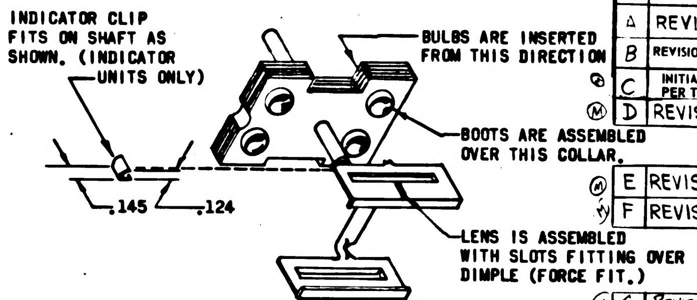
HORIZONTAL SPLIT

FOUR (4) WAY SPLIT

THREE (3) WAY SPLIT -26 OF TABLE B

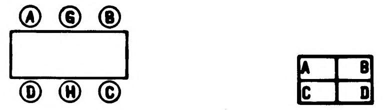
DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6


INDICATOR CLIP FITS ON SHAFT AS SHOWN. (INDICATOR UNITS ONLY)
BULBS ARE INSERTED FROM THIS DIRECTION
BOOTS ARE ASSEMBLED OVER THIS COLLAR.
LENS IS ASSEMBLED WITH SLOTS FITTING OVER DIMPLE (FORCE FIT.)
.145
.124

LAMP MODULE ASSEMBLY
FIGURE 9

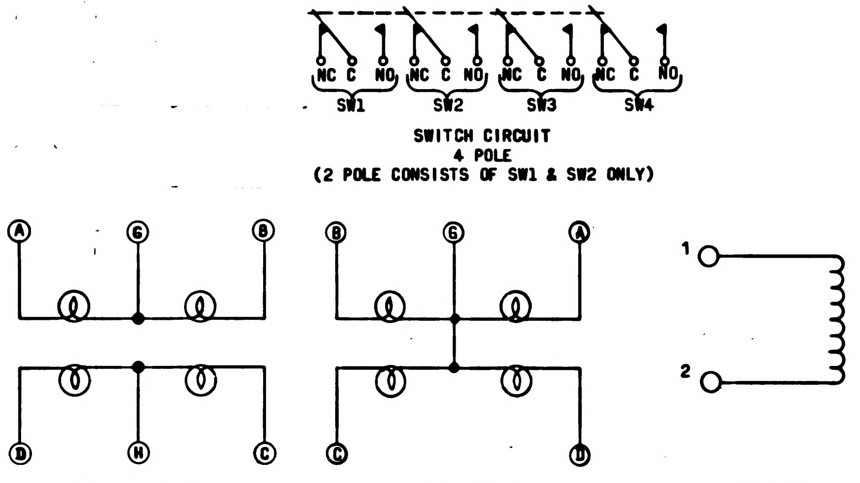
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	[illegible]	EF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP PF
G	REVISION STATUS CHANGED	4 FEB 66	RJU
H	REVISION STATUS CHANGED	16 FEB 66	OKD
J	REVISION STATUS CHANGED	24 MAY 66	RGB CP


A
G
B
D
H
C
A B
C D

LAMP TERMINALS
(TERMINAL H DOES NOT APPEAR ON SINGLE GROUND UNITS)

LENS COLOR DISPLAY
FIGURE 10

FIGURE 10
(VIEWS FROM FRONT OF ASSEMBLY)


NC C NO
SW1
SW2
SW3
SW4
A
G
B
D
H
C
1
2

SWITCH CIRCUIT
4 POLE
(2 POLE CONSISTS OF SW1 & SW2 ONLY)

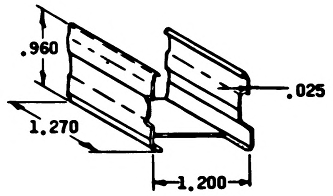
LAMP CIRCUIT
(ISOLATED DUAL GROUNDS)

LAMP CIRCUIT
(SINGLE GROUND)

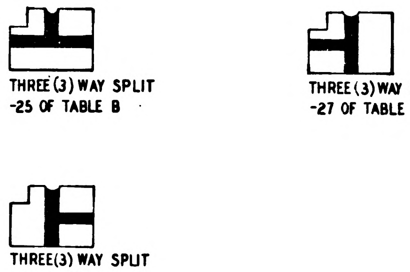
HOLDING COIL CIRCUIT

ALL CIRCUITS ARE INDEPENDANT OF EACH OTHER UNLESS OTHERWISE STATED

SCHEMATIC DIAGRAMS
(FOR REFERENCE ONLY)
FIGURE 11


.960
.025
1.270
1.200

MOUNTING COVER
FIGURE 7



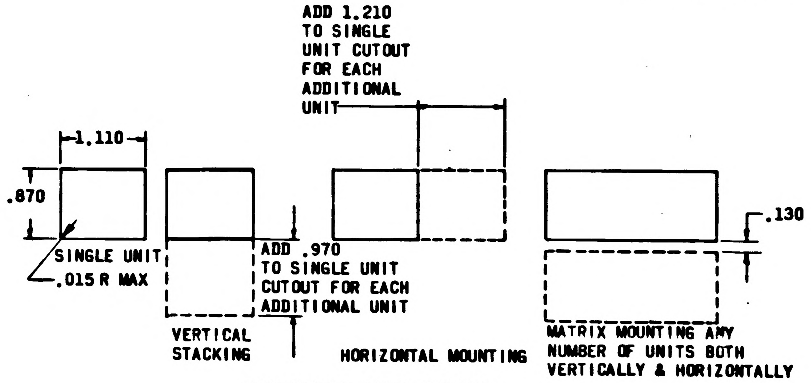
THREE (3) WAY SPLIT -25 OF TABLE B

THREE (3) WAY SPLIT -27 OF TABLE B

THREE (3) WAY SPLIT -28 OF TABLE B

DIFFUSER

LENS ASSEMBLY (2 PIECES)
FIGURE 6 CONTINUED


ADD 1.210 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
1.110
.870
SINGLE UNIT
.015 R MAX
ADD .970 TO SINGLE UNIT CUTOUT FOR EACH ADDITIONAL UNIT
.130
VERTICAL STACKING
HORIZONTAL MOUNTING
MATRIX MOUNTING ANY NUMBER OF UNITS BOTH VERTICALLY & HORIZONTALLY

RECOMMENDED PANEL CUTOUTS
FIGURE 8

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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SEE REQUIREMENTS

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NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO 1897337
SCALE —
WT
SHEET 3 OF 9

1897337 J

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REVISIONS 3

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR	8 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJW
H	REVISION STATUS CHANGED	16 FEB 66	OKD
J	REVISION STATUS CHANGED	24 MAY 66	CP

TABLE A, B & C FOR SPARES

TABLE A - COLORED BOOTS (FIGURE 5)

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	COLOR
-10	10-R	RED
-11	10-G	GREEN
-12	10-A	AMBER
-13	10-W	WHITE
-14	10-515	INDICATOR CLIP (SEE FIG. 9)

NOTE: WHITE COLOR IS PRODUCED WITH LIGHT BLUE BOOTS

TABLE B - LENS ASSEMBLY (FIGURE 6)

SPARE LEGEND PLATES ARE TO BE ORDERED PER THE MANUFACTURER'S PART NUMBERS LISTED IN TABLE 1 THRU 6

DIFFUSER

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	STYLE
-21	10-1	FULL DISPLAY
-22	10-2	HORIZONTALLY SPLIT DISPLAY
-23	10-3	VERTICALLY SPLIT DISPLAY
-24	10-5	FOUR (4) WAY SPLIT
-25	10-21	3 WAY SPLIT
-26	10-22	3 WAY SPLIT
-27	10-31	3 WAY SPLIT
-28	10-32	3 WAY SPLIT

TABLE C - SWITCHES

DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF.)	SWITCHING ACTION
-31	10-7	2 POLE MOMENTARY
-32	10-8	4 POLE MOMENTARY
-33	10-9	2 POLE ALTERNATE
-34	10-11	4 POLE ALTERNATE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. LEGEND CALLOUT IS DEFINED AS FOLLOWS:
   a) A COMMA (,) IS USED TO SEPARATE LEGEND LINES
   b) A SLASH (/) IS USED TO SEPARATE LEGENDS IN SPLIT DISPLAYS
   c) A SHORT NARROW SLASH (/) IS USED ONLY AS A CHARACTER IN THE LEGEND.

EXAMPLE

G/N VOLTAGE PUSH RESET	
HIGH	LOW

G/N VOLTAGE, PUSH RESET/HIGH/LOW

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

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HOUSTON, TEXAS

LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE —
WT
SHEET 4 OF 9

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TABLE I
INDICATOR ONLY (FIGURE 1)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-101	P10-C3-1-W-X-0-E	10-4-14 G&N ON, (PTC, INHIBITED)	FULL DISPLAY	W	W	W	W		-201	10-4-14 G&N ON, (PTC, INHIBITED)
-102	P10-C3-1-W-X-0-E	10-4-14 LORS, TEST, CONFIG	FULL DISPLAY	W	W	W	W		-202	10-4-14 LORS, TEST, CONFIG

REVISIONS 23416

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	[illegible]
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	Revised Per TDRR 25573	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	DKD
J	REVISION STATUS CHANGED	26 MAY 66	RGB / CP

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

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NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE —
WT
SHEET 5 OF 9

1897337 J

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TABLE 2
INDICATOR LIGHT - SWITCH ASSEMBLY
TWO POLE MOMENTARY ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	MAGNETIC HOLDING COIL	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURERS LEGEND PART NUMBER
-301	P10-A1-2-W-X-7-E	10-4-16 READ MODE/SET MODE	HORIZONTAL SPLIT	NO	W	W	W	W		-401	10-4-16 READ MODE/SET MODE
-302	↑	↑ MON COARSE/MON FINE	↑	↑	↑	↑	↑	↑		-402	↑ MON COARSE/MON FINE
-303		IG SELECT/SET ENABLE								-403	IG SELECT/SET ENABLE
-304		MG SELECT/SET ENABLE								-404	MG SELECT/SET ENABLE
-305		OG SELECT/SET ENABLE								-405	OG SELECT/SET ENABLE
-306	↓	↓ SHAFT SELECT/SET ENABLE	↓	↓	↓	↓	↓	↓		-406	↓ SHAFT SELECT/SET ENABLE
-307	P10-A1-2-W-X-7-E	10-4-16 TRUN SELECT/SET ENABLE	HORIZONTAL SPLIT	NO	W	W	W	W		-407	10-4-16 TRUN SELECT/SET ENABLE
-308	P10-A1-1-W-X-7-E	10-4-13 PUSH TO, INITIATE	FULL DISPLAY	NO	W	W	W	W		-408	10-4-13 PUSH TO, INITIATE
-309	P10-A1-1-W-X-7-E	10-4-12 POWER ON	FULL DISPLAY	NO	W	W	W	W		-409	10-4-12 POWER ON
-310	P10-A1-1-W-X-7-E	10-4-13 RELAY, COMMAND	FULL DISPLAY	NO	W	W	W	W		-410	10-4-13 RELAY, COMMAND

REVISIONS 23416

SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED	16 SEP 65	CF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	REW
(M) D	REVISION STATUS CHANGED	30 NOV 65	RLP
(M) E	REVISION STATUS CHANGED	3 DEC 65	RLP
(M) F	REVISED PER TDRR 25294	18 JAN 66	RLP
(M) G	REVISION STATUS CHANGED	4 FEB 66	RJJ
(M) H	REVISION STATUS CHANGED	16 FEB 66	DKD
J	REVISION STATUS CHANGED	24 MAY 66	RGB CP

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LIST OF MATERIALS

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LIGHT-INDICATOR AND
LIGHT-INDICATOR SWITCH ASSEMBLY
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE
WT
SHEET 6 OF 9

1897337 J

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REVISIONS 34?6			
SYM	DESCRIPTION	DATE	APPD
A	REVISED PER MXC 204913	16 SEP 65	CF
B	REVISION STATUS CHANGED	30 SEP 65	B.
C	INITIAL RELEASE CLASS A PER TDRR 34?6	8 OCT 65	WRB JC
D	REVISION STATUS CHANGED	30 NOV 65	RLP
E	REVISED PER TDRR 24404	3 DEC 65	RLP
F	REVISION STATUS CHANGED	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJU
H	REVISION STATUS CHANGED	16 FEB 66	DKD
J	REVISED PER TDRR 28933	24 MAY 66	RGB CP

TABLE 3
INDICATOR - LIGHT SWITCH ASSEMBLY
TWO POLE ALTERNATE ACTION (FIGURE 2)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-501	P10-A1-1-W-X-9-E	10-4-14 INHIBIT, COMPUTER, POWER FAIL	FULL DISPLAY	W	W	W	W		-601	10-4-14 INHIBIT, COMPUTER, POWER FAIL
-502	P10-A1-2-W-X-9-E	10-4-16 MON COARSE/MON FINE	HORIZONTAL SPLIT	W	W	W	W		-602	10-4-16 MON COARSE/MON FINE
-503	P10-A1-1-W-X-9-E	10-4-14 READ, RATE TABLE, INPUT	FULL DISPLAY	W	W	W	W		-603	10-4-14 READ, RATE TABLE, INPUT
-504	P10-A1-1-W-X-9-E	10-4-14 LORS, RATE TABLE, CONTROL	FULL DISPLAY	W	W	W	W		-604	10-4-14 LORS, RATE TABLE, CONTROL
-505	P10-A1-2-W-X-9-E	10-4-16 DC POSITIVE/DC NEGATIVE	HORIZONTAL SPLIT	W	W	W	W		-605	10-4-16 DC POSITIVE/DC NEGATIVE

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99974	D	1897337
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REVISIONS			
SYM	DESCRIPTION	DATE	APPD
A	REVISION STATUS CHANGED		
B	REVISED PER MXC-205309	30-SEP-65	B.
C	INITIAL RELEASE CLASS A PER TDRR 2346	18 OCT 65	WRB
D	REVISED PER TDRR 24063	30 NOV 65	RLP
E	REVISION STATUS CHANGED	3 DEC 65	RLP
F	REVISED PER TDRR 25294	18 JAN 66	RLP
G	REVISION STATUS CHANGED	4 FEB 66	RJJ
H	REVISION STATUS CHANGED	16 FEB 66	DKD
J	REVISION STATUS CHANGED	24 MAY 66	RGB CP

TABLE 4
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE MOMENTARY ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		MAGNETIC HOLDING COIL (FIGURE 4)	FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)			A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-701	P10-B2-2-WG-X-8-E	10-4-16 CHARGING/FULL CHARGE	YES	HORIZONTAL SPLIT	W	W	G	G		-801	10-4-16 CHARGING/FULL CHARGE
-702	P10-A1-2-W-X-8-E	10-4-17 X BAR, INPUT/ X BAR, OUTPUT	NO	HORIZONTAL SPLIT	W	W	W	W		-802	10-4-17 X BAR, INPUT/ X BAR, OUTPUT

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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HEAT TREATMENT SEE REQUIREMENTS
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LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
99974	D	1897337

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TABLE 5
INDICATOR LIGHT - SWITCH ASSEMBLY
FOUR POLE ALTERNATE ACTION (FIGURE 3)

NASA DASH NUMBER	MASTER SPECIALTIES PART NUMBER (FOR REF) (TOTAL MFG. P/N CONSISTS OF ASSEMBLY P/N AND LEGEND P/N)		FRONT LENS STYLE (FIGURE 6)	DISPLAY COLORS (FIGURE 10)				REMARKS	LENS ASSEMBLY (LEGEND PLATES ONLY)	
	ASSEMBLY PART NUMBER	LEGEND PART NUMBER (SEE NOTE 1)		A	B	C	D		NASA DASH NUMBER	MANUFACTURER'S LEGEND PART NUMBER
-751	P10-A1-1-W-X-11-E	10-4-13 POWER, ON	FULL DISPLAY	W	W	W	W		-851	10-4-13 POWER, ON
-752	P10-A1-2-W-X-11-E	10-4-17 800 CPS, PH GEN / 3200 CPS, PH GEN	HORIZONTAL SPLIT	W	W	W	W		-852	10-4-17 800 CPS, PH GEN / 3200 CPS, PH GEN
-753	P10-A1-1-W-X-11-E	10-4-12 VOLTMETER	FULL DISPLAY	W	W	W	W		-853	10-4-12 VOLTMETER
-754	P10-A1-2-W-X-11-E	10-4-17 DIRECT, PULSES / VARIABLE, PULSES	HORIZONTAL SPLIT	W	W	W	W		-854	10-4-17 DIRECT, PULSES / VARIABLE, PULSES
-755	P10-A1-1-W-X-11-E	10-4-12 SCOPE	FULL DISPLAY	W	W	W	W		-855	10-4-12 SCOPE
-756	P10-A1-2-W-X-11-E	10-4-16 PH GEN CAL / NORMAL	HORIZONTAL SPLIT	W	W	W	W		-856	10-4-16 PH GEN CAL / NORMAL
-757	P10-A1-2-W-X-11-E	10-4-17 800~ EXC #1, VARIABLE / 800~ EXC #1, FIXED	HORIZONTAL SPLIT	W	W	W	W		-857	10-4-17 800~ EXC #1, VARIABLE / 800~ EXC #1, FIXED
-758	P10-A1-2-W-X-11-E	10-4-17 800~ EXC #2, VARIABLE / 800~ EXC #2, FIXED	HORIZONTAL SPLIT	W	W	W	W		-858	10-4-17 800~ EXC #2, VARIABLE / 800~ EXC #2, FIXED
-759	P10-A1-2-W-X-11-E	10-4-17 3200~ EXC, VARIABLE / 3200~ EXC, FIXED	HORIZONTAL SPLIT	W	W	W	W		-859	10-4-17 3200~ EXC, VARIABLE / 3200~ EXC, FIXED

REVISIONS 23416

	SYM	DESCRIPTION	DATE	APPROVAL
	A	REVISION STATUS CHANGED	16 SEP 65	EF
	B	REVISION STATUS CHANGED	30 SEP 65	B. EF
Ⓒ	C	INITIAL RELEASE CLASS A PER TDRR 23416	18 OCT 65	WRB
Ⓜ	D	REVISION STATUS CHANGED	30 NOV 65	RLP
Ⓜ	E	REVISION STATUS CHANGED	3 DEC 65	RLP
Ⓜ	F	REVISED PER TDRR 25294	18 JAN 66	RLP
Ⓜ	G	REVISION STATUS CHANGED	4 FEB 66	RJJ
Ⓜ	H	REVISED PER TDRR 26081	16 FEB 66	DKD
	J	REVISION STATUS CHANGED	24 MAY 66	RGB CP

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .010 ANGLES ± 1/2°
DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

HEAT TREATMENT
SEE REQUIREMENTS

FINAL FINISH
SEE REQUIREMENTS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT NAS9 497

DRAWN J. Patterson DATE 30 JUL 65
CHECKED Ed Foster 29 JUL 65
APPROVAL 11 AUG 65
APPROVAL J. M. Watkins 10-20-65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LIGHT - INDICATOR AND
LIGHT - INDICATOR SWITCH ASSEMBLY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE D
NASA DRAWING NO. 1897337
SCALE —
WT
SHEET 9 OF 9

1897337 J

REVISIONS 23398					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC-204951		16-SEP-65	B. CP
B		INITIAL RELEASE CLASS A PER TDRR 23398		18 OCT 65	RH

REQUIREMENTS:

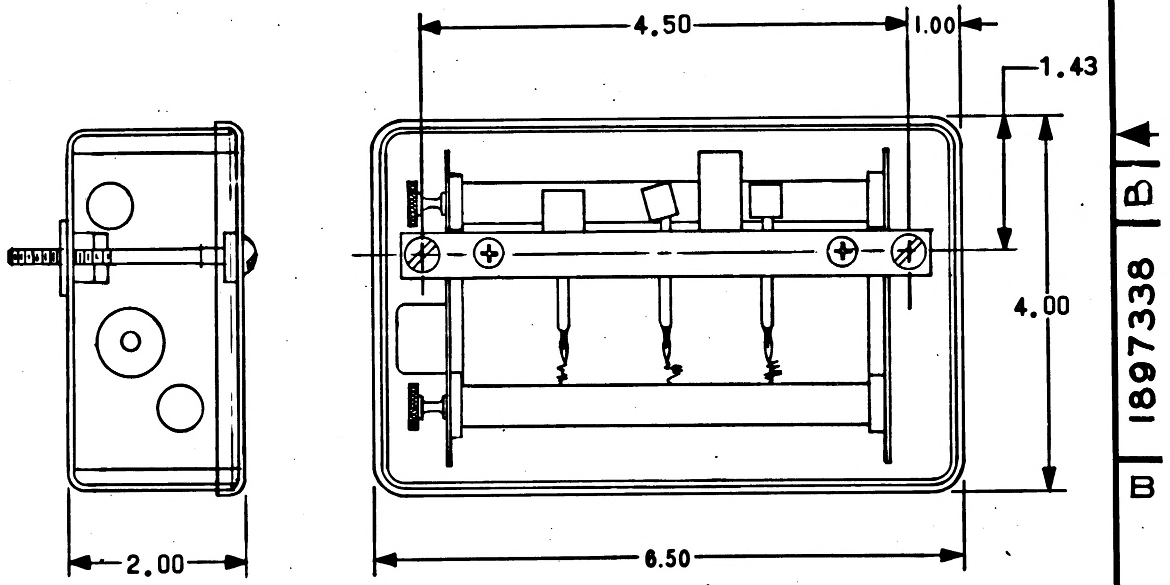
1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   A. MARKING:
      (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. MANUFACTURER'S PART NUMBER MAY APPEAR ON THE UNIT.
      (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
          SUPPLIER'S NAME
          NASA PART NUMBER
          DATE CODE, OR DATE OF MANUFACTURE
   B. MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   A. EACH CHART ROLL TO BE TWO FEET LONG.
   B. CHART ADVANCE TO BE BY RATCHET.
   C. STANDARD MOUNTING BRACKET IS NOT REQUIRED.
   D. MATERIAL:
      (1) CASE: CLEAR TENITE BUTYRATE.
      (2) MOUNTING SCREWS: STAINLESS STEEL (6-32 THD X 2-1/2 LONG).
      (3) CHART ROLL: PLASTIC COATED PAPER TAPE (+220°F. MAX TEMP) (PART NO. 24T REF.)
   E. WEIGHT: ONE AND ONE HALF POUNDS.
   F. ACCURACY: ±10% OF RECORDED "G" LEVEL.

DASH NUMBER	"G" LEVEL (MAXIMUM)	MANUFACTURER'S PART NUMBER (REF)
-001	30	30XYZ-24-T
-002	25	25XYZ-24-T
-003	20	20XYZ-24-T
-004	15	15XYZ-24-T
-005	10	10XYZ-24-T

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



ALL DIMENSIONS FOR REFERENCE ONLY

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± __ DECIMALS ± __ ANGLES ± __
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R.W. Turner DATE 11-AUG-65
CHECKED RwHogue 13 AUG 65
APPROVAL J.V. WEAN 16 AUG 65
APPROVAL L Gedeman 10/12/65
NASA APPROVAL
MIT APPROVAL 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, SHOCK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | 1897338
SCALE — | SHEET 1 OF 1

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
		REVISIONS 23398			
A		REVISED PER MXC-204951		16-SEP-65	B. CP
B		INITIAL RELEASE CLASS A PER TDRR 23390		8 OCT 65	RH CW
C		REVISED PER TDRR 24062		23-NOV-65	B. JH

REQUIREMENTS:

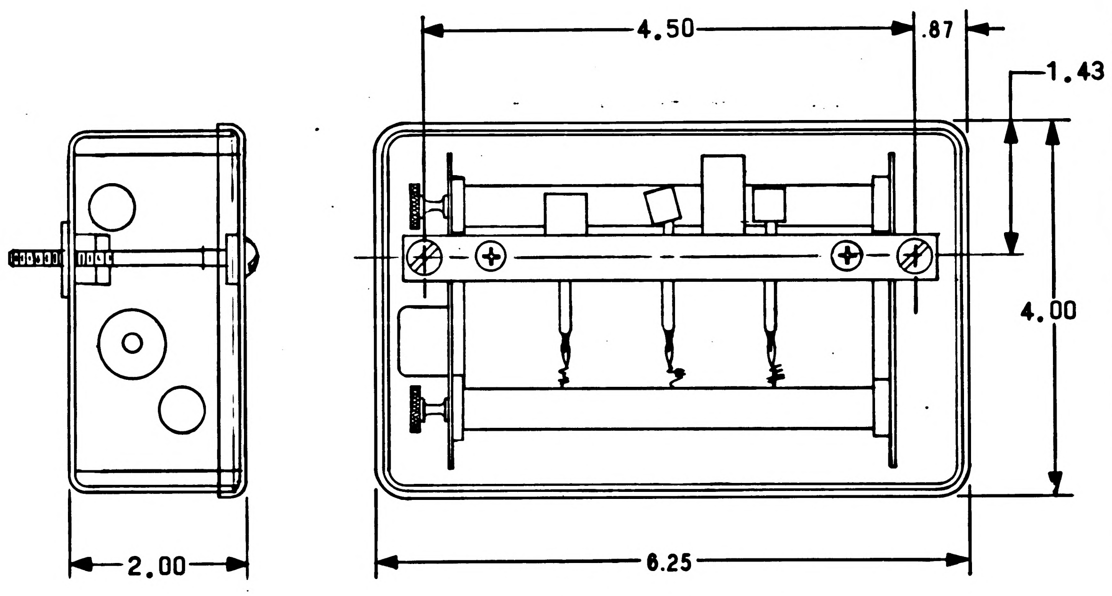
1. GENERAL:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   A. MARKING:
      (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. MANUFACTURER'S PART NUMBER MAY APPEAR ON THE UNIT.
      (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         SUPPLIER'S NAME
         NASA PART NUMBER
         DATE CODE, OR DATE OF MANUFACTURE
   B. MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   A. EACH CHART ROLL TO BE TWO FEET LONG.
   B. CHART ADVANCE TO BE BY RATCHET.
   C. STANDARD MOUNTING BRACKET IS NOT REQUIRED.
   D. MATERIAL:
      (1) CASE: CLEAR TENITE BUTYRATE.
      (2) MOUNTING SCREWS: STAINLESS STEEL (6-32 THD X 2-1/2 LONG).
      (3) CHART ROLL: PLASTIC COATED PAPER TAPE (+220°F. MAX TEMP) (PART NO. 24T REF.)
   E. WEIGHT: ONE AND ONE HALF POUNDS.
   F. ACCURACY: ±10% OF RECORDED "G" LEVEL.

DASH NUMBER	"G" LEVEL (MAXIMUM)	ASSEMBLY	CHART ROLL
-001	30	30XYZ	24T
-002	25	25XYZ	24T
-003	20	20XYZ	24T
-004	15	15XYZ	24T
-005	10	10XYZ	24T
-006			24T

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



ALL DIMENSIONS FOR REFERENCE ONLY

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − DECIMALS + — − ANGLES + — −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN R.W. Turner DATE 11-AUG-65
CHECKED R.W. Hogue 13 AUG 65
APPROVAL J.V. WEAN 16 AUG 65
APPROVAL L. Jedeman 10/12/65
NASA APPROVAL
MIT APPROVAL W Kupfer 20 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, SHOCK

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | 1897338
SCALE — | SHEET 1 OF 1

MIL 1077C—P

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		UPGRADED TO CLASS A PER TDRR 25325	—	7 DEC 65	J.J.

REVISIONS

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE FOLLOWING:
     - (1) NASA PART NUMBER.
     - (2) MANUFACTURER'S NAME OR SYMBOL.
     - (3) POLARITY OF TERMINALS (+ & -).
     - (4) DATE OF MANUFACTURE.
   - B. ELECTRICAL CHARACTERISTICS: BATTERIES SHALL BE SHIPPED IN A FULLY DISCHARGED STATE.
3. DESIGN:
   - A. OPEN CIRCUIT VOLTAGE: 1.5 VOLTS NOMINAL.
   - B. CAPACITY: 20 AMPERE HOURS.
   - C. OPERATION: VENT TRAP AND EDGE PACKING SHALL BE UTILIZED TO ENABLE DISCHARGE OF BATTERIES IN ANY POSITION.

DASH NUMBER	FIGURE NUMBER	MANUFACTURER'S PART NUMBER (REF)
-001	1	LR-20 MODIFIED (PER REQ 3.C.)
-002	2	6199

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

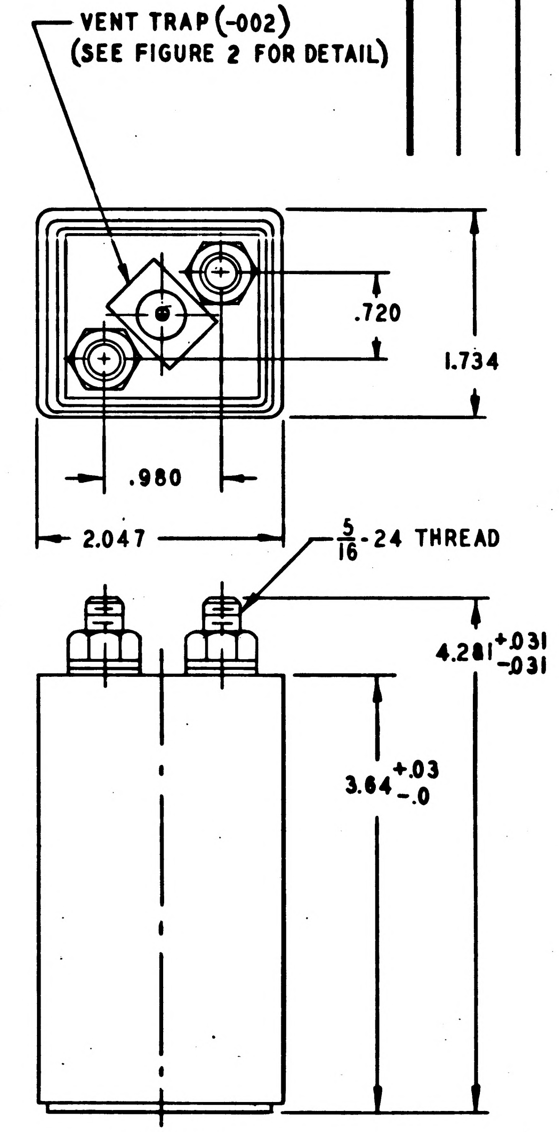
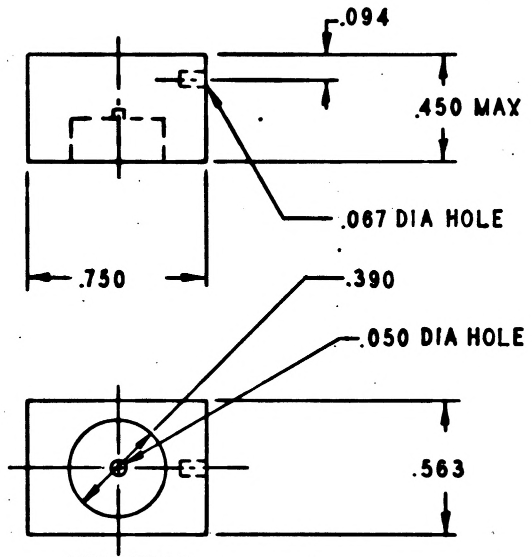


FIGURE I



VENT TRAP
FIGURE 2

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.016	+ —
− —	−.016	− —

DO NOT SCALE THIS DRAWING

MATERIAL —

Contract NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

DRAWN L.J. Tanko DATE 6 Aug 65
CHECKED MALIKOWSKI/CF
APPROVAL Becenthal 8-18-65
APPROVAL J. M. Watson 1-5-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Klupfer 18 Jan 66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY, STORAGE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897339
SCALE NONE
SHEET 1 OF 1

MIL 1077C—P

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		UPGRADED TO CLASS A PER TDRR 25325	—	7 DEC 65	JJJ
B		REVISED PER TDRR 26987		14 MAR 66	JHP C9P

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE FOLLOWING:
     - (1) NASA PART NUMBER.
     - (2) MANUFACTURER'S NAME OR SYMBOL.
     - (3) POLARITY OF TERMINALS (+ & -).
     - (4) DATE OF MANUFACTURE.
   - B. ELECTRICAL CHARACTERISTICS: BATTERIES SHALL BE SHIPPED IN A FULLY DISCHARGED STATE.
3. DESIGN:
   - A. OPEN CIRCUIT VOLTAGE: 1.5 VOLTS NOMINAL.
   - B. CAPACITY: 20 AMPERE HOURS.
   - C. OPERATION: VENT TRAP AND EDGE PACKING SHALL BE UTILIZED TO ENABLE DISCHARGE OF BATTERIES IN ANY POSITION.

DASH NUMBER	FIGURE NUMBER	MANUFACTURER'S PART NUMBER (REF)	DESCRIPTION
-001	1	LR-20 MODIFIED (PER REQ 3.C.)	INCLUDES BATTERY AND VENT TRAP (-002 REF.)
-002	2	6199	VENT TRAP ONLY

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

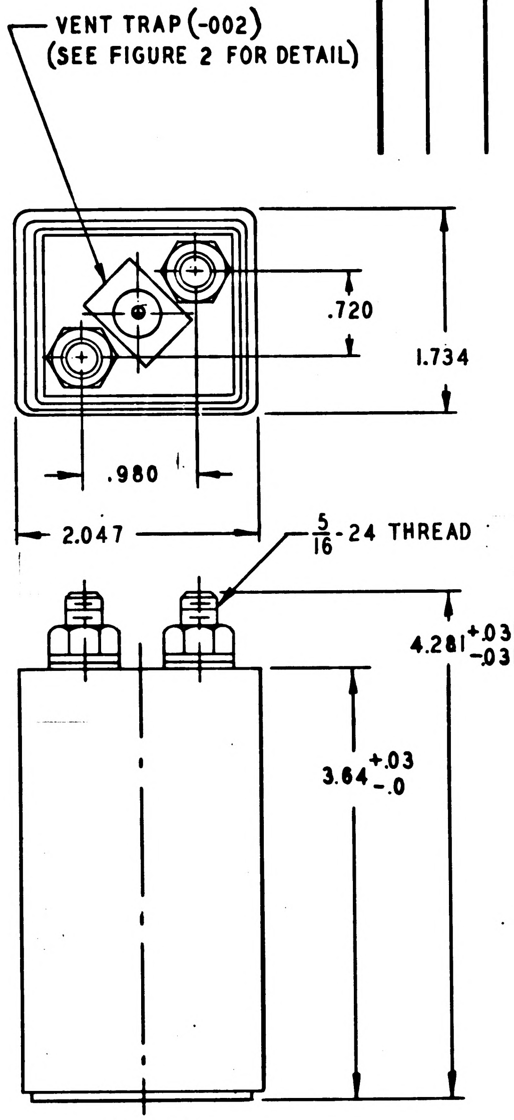
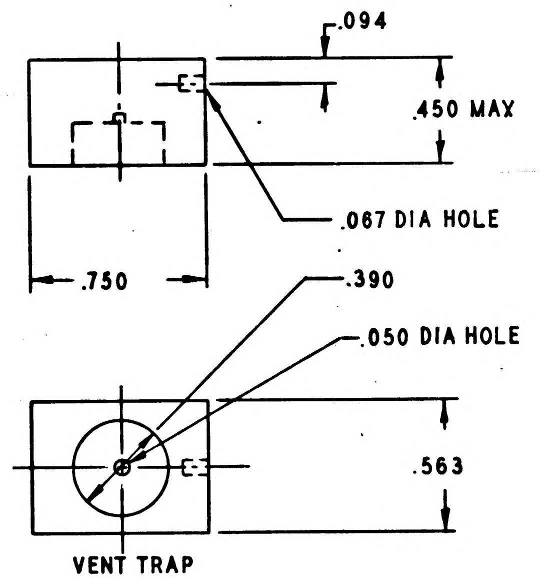


FIGURE I



VENT TRAP
FIGURE 2

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.016	+ —
- —	-.016	- —

DO NOT SCALE THIS DRAWING

MATERIAL —

Contract NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

DRAWN L. J. Tanko DATE 6 Aug 65
CHECKED MALIKOWSKI/CF
APPROVAL Beccenthal 8-18-65
APPROVAL J M Watson 1-5-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL W. Kupfer 18 Jan 66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY, STORAGE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897339
SCALE NONE
SHEET 1 OF 1

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		UPGRADED TO CLASS A PER TDRR 25325	—	7 DEC 65	JJJ
Ⓜ B		REVISED PER TDRR 26987		14 MAR 66	JHP / C9P
C		REVISED PER TDRR 30444		8 AUG 66	EMF / JI

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER ND 1002019 WITH THE FOLLOWING:
     - (1) NASA PART NUMBER.
     - (2) MANUFACTURER'S NAME OR SYMBOL.
     - (3) POLARITY OF TERMINALS (+ & -).
     - (4) DATE OF MANUFACTURE AND DATE OF (DASH NO. 001 ONLY) ACTIVATION.
   - B. DASH NO. 001: ELECTRICAL CHARACTERISTICS: BATTERIES SHALL BE SHIPPED IN A FULLY DISCHARGED STATE.
   - C. DASH NO. 003: ELECTRICAL CHARACTERISTICS; BATTERIES SHALL BE SHIPPED IN A DRY UNCHARGED STATE. A FILLING KIT CONTAINING THE FOLLOWING ITEMS SHALL BE SUPPLIED:
     - (1) PREMEASURED (50 CC SOLUTION OF POTASSIUM HYDROXIDE REF.) ELECTROLITE IN A SEALED FILLING BOTTLE.
     - (2) FILLER CAP AND RUBBER WASHER.
     - (3) SPONGE RUBBER PLUG.
     - (4) ABSORBENT COTTON.
     - (5) VENT CLEANER.
     - (6) VENT TRAP.
     - (7) ACTIVATION LABLE.
3. DESIGN:
   - A. OPEN CIRCUIT VOLTAGE: 1.5 VOLTS NOMINAL.
   - B. CAPACITY: 20 AMPERE HOURS.
   - C. OPERATION: VENT TRAP AND EDGE PACKING SHALL BE UTILIZED TO ENABLE DISCHARGE OF BATTERIES IN ANY POSITION.

DASH NUMBER	FIGURE NUMBER	MANUFACTURER'S PART NUMBER (REF)	DESCRIPTION
-001	1	LR-20-3 MODIFIED (PER REQ 3.C.)	INCLUDES BATTERY AND VENT TRAP (-002 REF.)
-002	2	6199	VENT TRAP ONLY
-003	1	LR-20-3 MODIFIED PER REQ 2.C AND 3.C	INCLUDES DRY UNCHARGED BATTERY, VENT TRAP (-002 REF.) AND FILLING KIT DESCRIBED IN REQ 2.C

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

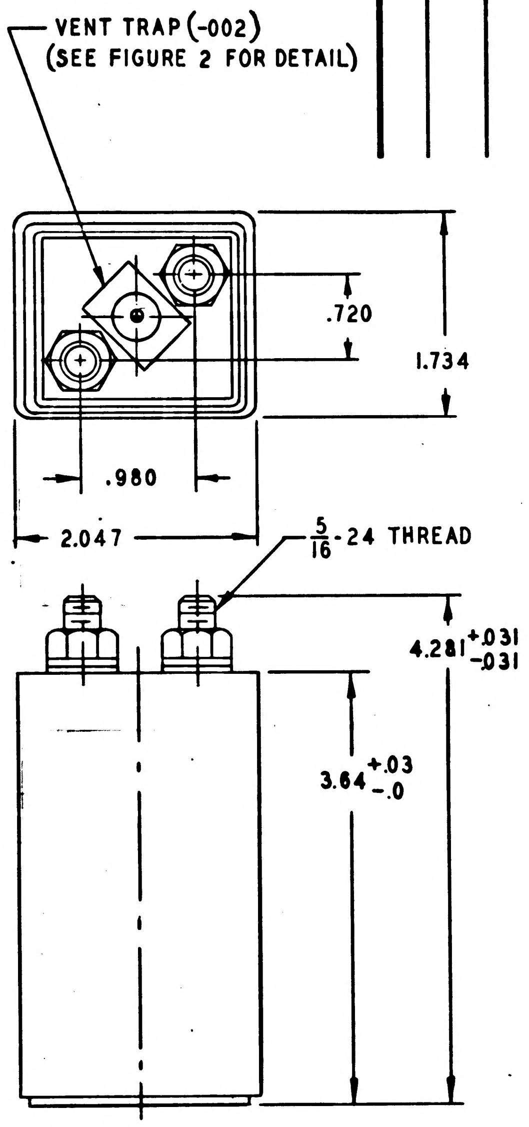
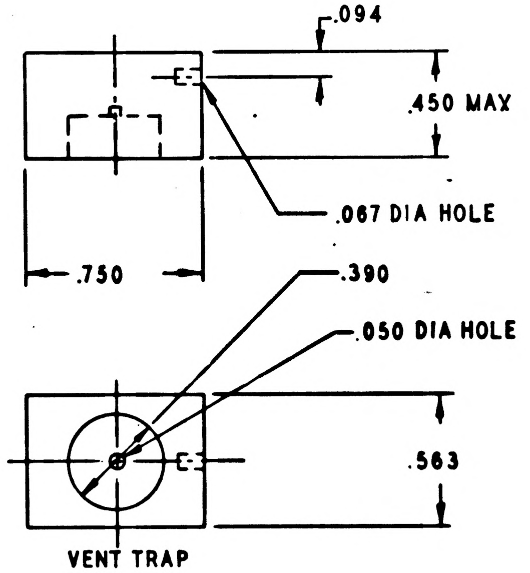


FIGURE I



VENT TRAP
FIGURE 2

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ .016	+ —
— —	— .016	— —

DO NOT SCALE THIS DRAWING

MATERIAL —

Contract NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS

DRAWN L. J. Banko DATE 6 Aug 65
CHECKED MALIKOWSKI/EF
APPROVAL Becenthal 8-8-65
APPROVAL J M Walson 1-5-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL W Kupfer 18 Jan 66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY, STORAGE

SPECIFICATION CONTROL DRAWING

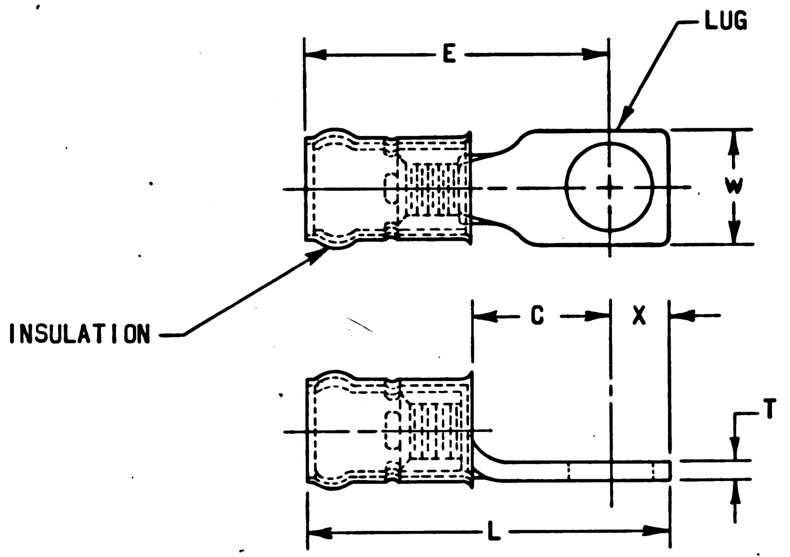
CODE IDENT NO.	SIZE	
99974	C	1897339
SCALE NONE		SHEET 1 OF 1

REVISIONS 23919					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23919		19 OCT 65	LF

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. PRESERVATION, PACKAGING, PACKING AND CONTAINER MARKING: PER ND 1002215, CLASS 1, CODE 7.
2. DESIGN:
   - A. MATERIAL:
     - (1) LUG: COPPER PER QQ-C-576.
     - (2) INSULATION: VINYL PER MIL-T-7928.
   - B. FINISH:
     - (1) LUG: ELECTRODEPOSITED .0003 MIN THICKNESS PER MIL-T-10727A TYPE I.

DASH NUMBER	WIRE RANGE (REF)	STUD SIZE (REF)	C MIN	W REF	X REF	E MAX	L MAX	T REF	AIRCRAFT-MARINE PRODUCTS INC CATALOG ITEM (FOR REF)	
									WIRE INSUL. DIA	
									.080-.125	.105-.140
-001	22 TO 16	4	.187	.296	.140	.593	.734	.031	34841	
-003		6	.296	.250	.125	.703	.828	.031	33475	
-004										33476
-005			.187	.296	.140	.593	.734	.031	32453	
-006										32454
-007			.203	.343	.156	.609	.765	.031	32465	
-009			.203	.312	.156	.609	.765	.031	33178	
-010										33179
-011		10	.281	.468	.203	.656	.859	.031	33166	
-012			.281	.468	.203	.671	.875	.031		33167
-015		2	.203	.187	.109	.593	.718	.031		324572
-016			.203	.187	.109	.593	.718	.031	325148	



THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Patterson DATE 10 AUG 65
CHECKED J G Lima 12 AUG 65
APPROVAL 13 AUG 65
APPROVAL L Jedeman 10/19/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, LUG - INSULATED RECTANGULAR TONGUE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897342
SCALE NONE SHEET 1 OF 2

MIL 1077C—P

J.L.

REVISIONS 23919					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23919		19 OCT 65	

TABLE (CONTINUED)

DASH NUMBER	WIRE RANGE (REF)	STUD SIZE (REF)	C MIN	W REF	X REF	E MAX	L MAX	T REF	AIRCRAFT-MARINE PRODUCTS INC CATALOG ITEM (FOR REF)	
									WIRE INSUL. DIA	
									.105-.150	.115-.170
-018	16 TO 14	4	.256	.218	.109	.596	.390	.031		33177
-019			.203	.343	.156	.593	.750	.031	36235	
-021		6	.312	.250	.125	.703	.828	.031	33172	
-022			.312	.250	.125	.718	.843	.031		33173
-023			.203	.296	.140	.593	.734	.031	33168	
-024			.203	.296	.140	.593	.734	.031		33169
-025			.203	.296	.140	.593	.734	.031	33168	
-026			.203	.343	.156	.593	.750	.031		36238
-028		8	.312	.250	.125	.703	.828	.031		35279
-029			.343	.375	.187	.734	.921	.031	33174	
-030			.281	.312	.250	.671	.921	.031		321445
-031			.203	.343	.156	.593	.750	.031	36239	
-032			.203	.343	.156	.593	.750	.031		36240
-033		10	.203	.343	.156	.593	.750	.031		36242
									WIRE INSUL. DIA .230 MAX	
-051	12 TO 10	5 OR 6	.218	.296	.140	.796	.937	.046	34512	
-061		8	.281	.312	.250	.859	1.437	.046	321447	
									WIRE INSUL. DIA .050-.082	
-081	26 TO 22	1 OR 2	.203	.165	.109	.515	.625	.018	321620	
-085		5 OR 6	.296	.312	.187	.640	.828	.018	321023	
-094		8	.296	.312	.187	.640	.828	.018	322791	
-102		10	.296	.312	.187	.640	.828	.018	322792	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Patterson DATE 10 AUG 65
CHECKED De Lima 12 AUG 65
APPROVAL 13 AUG 65
APPROVAL 10/19/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, LUG - INSULATED RECTANGULAR TONGUE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897342
SCALE —
SHEET 2 OF 2

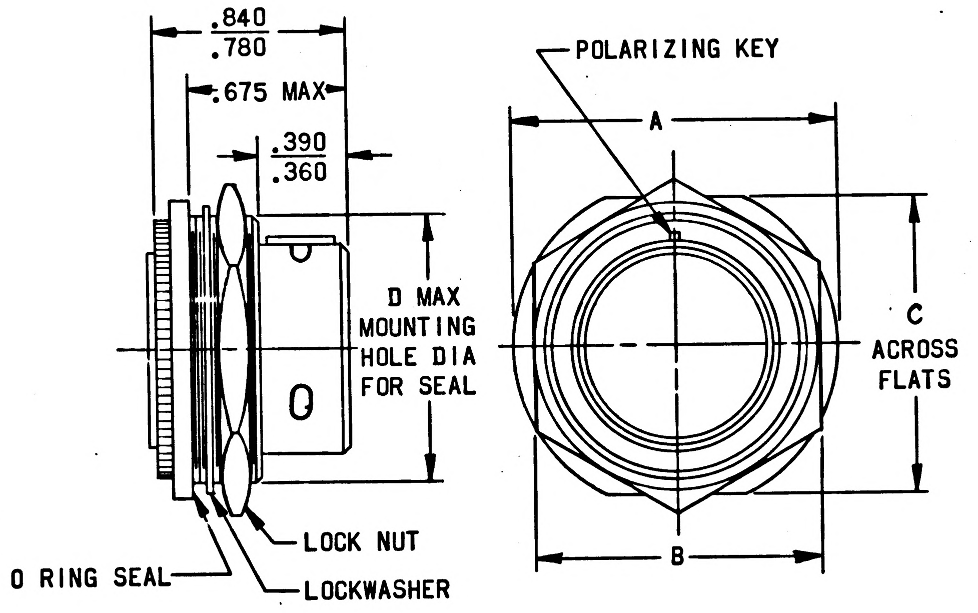
REVISIONS			21988		
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER TDRR 22908		8 OCT 65	cmk / EF

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP-TYPE PIN CONTACTS SHALL BE PER 1010770 OR 1897190.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY PER MIL-C-26482.
       - (b) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT PLUS SILICONE RUBBER GROMMET.
       - (c) GASKETS: SILICONE RUBBER.
     - (2) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C, 500 VDC 5000 MEGOHMS AT 125°C, 500 VDC.
     - (3) FINISH: CLEAR CADMIUM FINISH.
     - (4) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES.
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC.
     - (3) WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 7 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM THE REAR OF THE SOCKET CONTACT CRIMP BARREL TO THE REAR OF THE PIN CONTACT CRIMP BARREL.
     - (5) OPERATING TEMPERATURE: +125°C.
   - B. MECHANICAL REQUIREMENTS:
     - (1) COUPLING MECHANISM: PUSH PULL QUICK DISCONNECT.
     - (2) MAX ENGAGEMENT FORCE: MIN DISENGAGEMENT FORCE (WITH CONTACTS). PER TABLE.
     - (3) CONTACT RETENTION: 20 LBS MIN, IN DIRECTION OF MATING FORCE.



PROCURE ONLY FROM APPROVED SOURCES LISTED ON *CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST.*

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Neissert DATE 10-AUG-65
CHECKED W. Diehl 12 AUG. 65
APPROVAL R. Trumneck 17 Aug 65
APPROVAL J. M. Watson 8-24-65
NASA APPROVAL
MIT APPROVAL 8-26-65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL

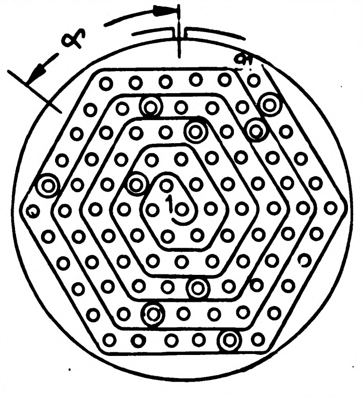
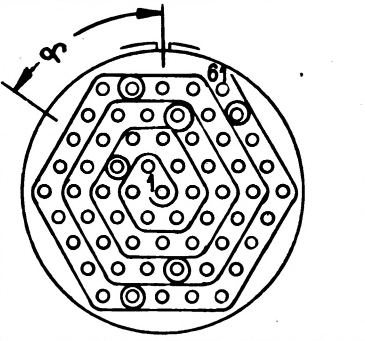
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897345
SCALE —
SHEET 1 OF 2

MIL 1077C—P

W.V.

REVISIONS 21988					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER TDRR 22908		11 OCT 65	cmk EF

DASH NUMBER	DEGREES α	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS A	DIMENSIONS B	DIMENSIONS C	DIMENSIONS D	MOUNTING THREAD SIZE	FIG NO.	INSERT ARRANGEMENT (MATING FACE VIEW)	MANUFACTURER'S PART NUMBER (REF)
-001 -002 -003 -004	N=0 W=225 X=150 Y=75	91	PIN	1.343 1.297	1.265 1.235	1.327 1.297	1.135	1-1/8-18NEF-2A	1		32053-27-30P 32053-27-30PW 32053-27-30PX 32053-27-30PY
-005 -006 -007 -008	N=0 W=225 X=150 Y=75	61	PIN	1.218 1.172	1.077 1.047	1.171 1.141	1.010	1-20UNEF-2A	1		32053-19-33P 32053-19-33PW 32053-19-33PX 32053-19-33PY

THE PART NUMBER IS THE DRAWING NUMBER
PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED DEGREES COUNTERCLOCKWISE RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. MATES WITH REVERSE SOCKET CONTACT PLUG PER 1010771 OR 1897207.
4. MOUNTS TO .093 MAX THICK PANEL.
5. FOR EXTRA SEALING PLUGS, SEE 1010958.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Weissert DATE 10-AUG-65
CHECKED W. Diehl 12 Aug. 65
APPROVAL R Trummer 12 Aug 65
APPROVAL J. M. Watson 8-24-65
NASA APPROVAL
MIT APPROVAL MG Miche 8-26-65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897345
SCALE —— SHEET 2 OF 2

MIL 1077C—P

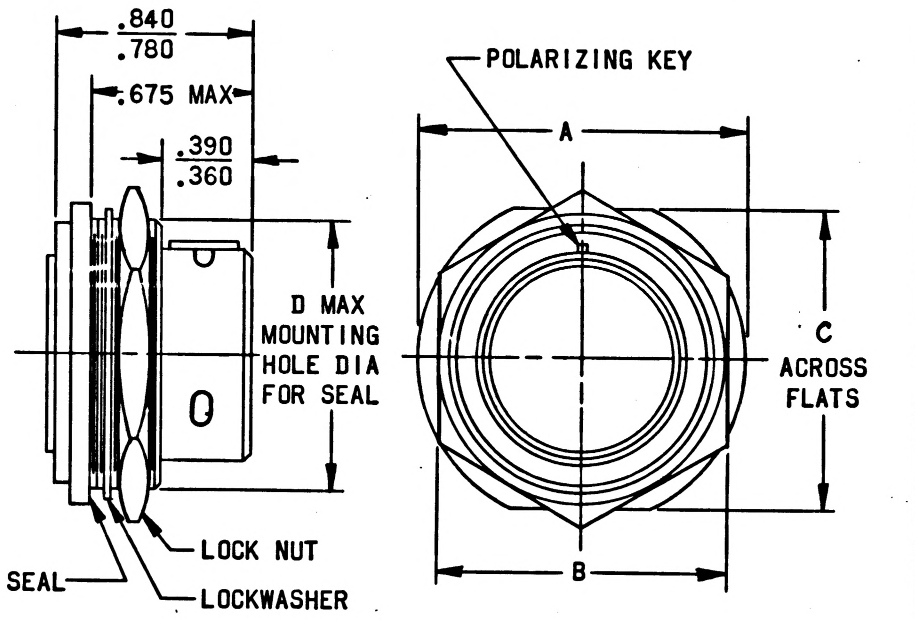
REVISIONS			21988		
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING ALL APPLICABLE REQUIREMENTS OF MIL-C-26482.
   - D. CRIMP-TYPE PIN CONTACTS SHALL BE PER 1010770 OR 1897190.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY PER MIL-C-26482.
       - (b) INSERT: SOLID DIELECTRIC PER MIL-M-14, TYPE MFH OR EQUIVALENT PLUS SILICONE RUBBER GROMMET.
       - (c) GASKETS: SILICONE RUBBER.
     - (2) INSULATION RESISTANCE: 100,000 MEGOHMS AT 25°C, 500 VDC 5000 MEGOHMS AT 125°C, 500 VDC.
     - (3) FINISH: CLEAR CADMIUM FINISH.
     - (4) MARKING:
       - (a) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
         - SUPPLIER'S NAME
         - NASA PART NUMBER
         - DATE CODE, OR DATE OF MANUFACTURE
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PACKAGE.

3. DESIGN:
   - A. ELECTRICAL REQUIREMENTS:
     - (1) CONTACT CURRENT RATING: 3 AMPERES.
     - (2) VOLTAGE RATING: 250 VOLTS RMS OR 350 VDC.
     - (3) WITHSTANDING VOLTAGE: 375 V RMS AT 70,000 FT. 1500 V RMS AT SEA LEVEL.
     - (4) CONTACT RESISTANCE: 7 MILLIVOLTS MAX AT 3 AMP WHEN MEASURED FROM THE REAR OF THE SOCKET CONTACT CRIMP BARREL TO THE REAR OF THE PIN CONTACT CRIMP BARREL.
     - (5) OPERATING TEMPERATURE: +125°C.
   - B. MECHANICAL REQUIREMENTS:
     - (1) COUPLING MECHANISM: PUSH PULL QUICK DISCONNECT.
     - (2) MAX ENGAGEMENT FORCE: MIN DISENGAGEMENT FORCE (WITH CONTACTS). PER TABLE.
     - (3) CONTACT RETENTION: 20 LBS MIN, IN DIRECTION OF MATING FORCE.



MASTER

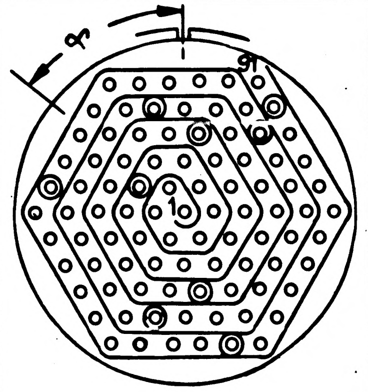
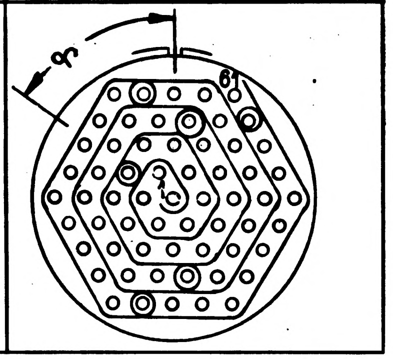
PROCURE ONLY FROM APPROVED SOURCES LISTED ON *CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST.*

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + – DECIMALS + – ANGLES + – DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL SEE REQUIREMENTS	DRAWN Heissert DATE 10-AUG-65 CHECKED W. Diehl 12 AUG. 65 APPROVAL R. Trummer 12 Aug 65 APPROVAL J. M. Watson 8-24-65	CONNECTOR, RECEPTACLE, ELECTRICAL SPECIFICATION CONTROL DRAWING
		CONTRACT NAS9-497	NASA APPROVAL MIT APPROVAL 8-26-65	CODE IDENT NO. 99974 SIZE C 1897345 SCALE — SHEET 1 OF 2

MIL 1077C-P

W.D,

REVISIONS 21988					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

DASH NUMBER	DEGREES ∝	NO. OF CONTACT CAVITIES	CONTACT TYPE	DIMENSIONS A	B	C	D	MOUNTING THREAD SIZE	FIG NO.	INSERT ARRANGEMENT (MATING FACE VIEW)
-001 -002 -003 -004	N=0 W=225 X=150 Y=75	91	PIN	1.343 1.297	1.265 1.235	1.327 1.297	1.135	1-1/8-18NEF-2B	1	
-005 -006 -007 -008	N=0 W=225 X=150 Y=75	61	PIN	1.218 1.172	1.077 1.047	1.171 1.141	1.010	1-20UNEF-2B	1	

THE PART NUMBER IS THE DRAWING NUMBER
PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR INSERTION AND REMOVAL OF CONTACTS.
2. ALTERNATE POSITIONS; THE INSERT, AS SHOWN, IS ROTATED DEGREES COUNTERCLOCKWISE RELATIVE TO THE ℄ OF THE MASTER KEY AS INDICATED. THIS ALTERATION SHALL NOT BE ACCOMPLISHED BY USER.
3. MATES WITH REVERSE SOCKET CONTACT PLUG PER 1010771 OR 1897207.
4. MOUNTS TO .093 MAX THICK PANEL.
5. FOR EXTRA SEALING PLUGS, SEE 1010958.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Weissert DATE 10-AUG-65
CHECKED W. Diehl 12 Aug. 65
APPROVAL R Trummer 13 Aug 65
APPROVAL J. M. Watson 8-24-65
NASA APPROVAL
MIT APPROVAL MG Mish 8-26-65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, RECEPTACLE, ELECTRICAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897345
SCALE ——
SHEET 2 OF 2

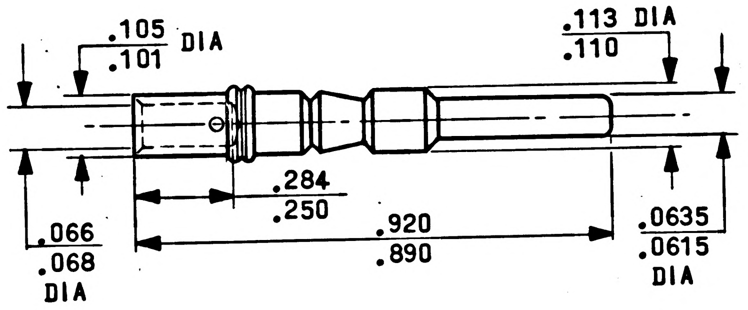
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
		REVISIONS 23392			
A		REVISED PER MXC-206103		19-OCT-65	B. EF
B		INITIAL RELEASE CLASS A PER TDRR 23392		19 OCT 65	WRB CW

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS SPECIFIED IN MIL-C-26636.

2. ACCEPTANCE AND INSPECTION:
   - A. MARKING:
     - (1) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: LEADED COPPER ALLOY PER MIL-C-26482.
   - B. FINISH (CONTACT BODY): .000100 MIN GOLD PLATE OVER COPPER PLATE.
   - C. MECHANICAL REQUIREMENTS:
     - (1) CONTACT RETENTION: 25 POUNDS MIN. AFTER 10 INSERTIONS AND WITHDRAWALS IN EITHER DIRECTION, WITHOUT DISPLACEMENT, WHEN INSTALLED IN CONNECTOR.
     - (2) CRIMP TENSILE STRENGTH: 50 POUNDS MIN. USING NO. 16 AWG STRANDED WIRE; 38 POUNDS MIN. USING NO. 18 AWG STRANDED WIRE; 19 POUNDS MIN. USING NO. 20 AWG STRANDED WIRE.
   - D. ELECTRICAL REQUIREMENTS:
     - (1) CURRENT RATING: 20 AMPERES MAX.
     - (2) CONTACT RESISTANCE: 21 MILLIVOLTS DC MAX. AT 20 AMPS USING NO. 16 AWG STRANDED WIRE. TEST PER MIL-C-26636.



DASH NUMBER	CONTACT SIZE	FOR USE WITH CONNECTOR SERIES (REF)	MANUFACTURER'S PART NUMBER (REF)
-001	NO. 16 AWG	DTK	0004-263-000

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR CRIMPING, INSERTION AND REMOVAL OF CONTACTS.
2. USABLE WIRE SIZES: AWG 16, 18 AND 20

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL: SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Btterson DATE 12 AUG 65
CHECKED RW Hogue 23 AUG 65
APPROVAL R. Trummer 23 Aug 65
APPROVAL L Gedinan 9/21/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, PIN, ELECTRICAL - CRIMP TYPE,
NO. 16

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897346
SCALE NONE SHEET 1 OF 1

MIL 1077C—P

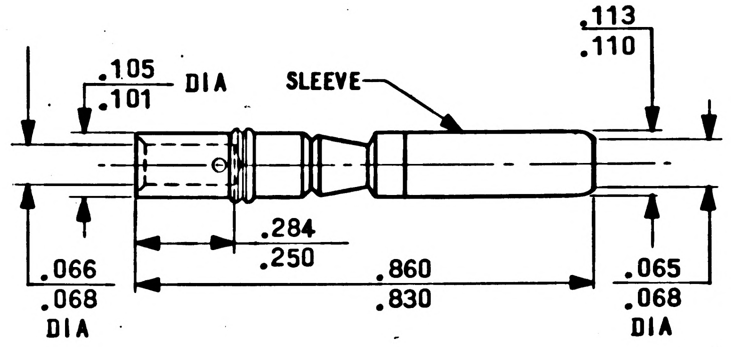
REVISIONS					23392
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED PER MXC-206104		19-OCT-65	B. EF
B		INITIAL RELEASE CLASS A PER TDRR 23392		19 OCT 65	WRB CW

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS SPECIFIED IN MIL-C-26636.

2. ACCEPTANCE AND INSPECTION:
   - A. CONTACT WITHDRAWAL FORCE: 2 OUNCES MIN. USING $\begin{matrix}.0616\\.0615\end{matrix}$ DIA TUNGSTEN CARBIDE TEST PIN PER MS 3197.
   - B. MARKING:
     - (1) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: LEADED COPPER ALLOY PER MIL-C-26482.
     - (2) SLEEVE (SOCKET): MONEL.
   - B. FINISH (CONTACT BODY): .000100 MIN GOLD PLATE OVER COPPER PLATE.
   - C. MECHANICAL REQUIREMENTS:
     - (1) CONTACT RETENTION: 25 POUNDS MIN. AFTER 10 INSERTIONS AND WITHDRAWALS IN EITHER DIRECTION, WITHOUT DISPLACEMENT, WHEN INSTALLED IN CONNECTOR.
     - (2) CRIMP TENSILE STRENGTH: 50 POUNDS MIN. USING NO. 16 AWG STRANDED WIRE; 38 POUNDS MIN. USING NO. 18 AWG STRANDED WIRE; 19 POUNDS MIN. USING NO. 20 AWG STRANDED WIRE.
   - D. ELECTRICAL REQUIREMENTS:
     - (1) CURRENT RATING: 20 AMPERES MAX.
     - (2) CONTACT RESISTANCE: 21 MILLIVOLTS DC MAX. AT 20 AMPS USING NO. 16 AWG STRANDED WIRE. TEST PER MIL-C-26636.



DASH NUMBER	CONTACT SIZE	FOR USE WITH CONNECTOR SERIES (REF)	MANUFACTURER'S PART NUMBER (REF)
-001	NO. 16 AWG	DTK	0007-094-000

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. SPECIAL TOOLING REQUIRED FOR CRIMPING, INSERTION AND REMOVAL OF CONTACTS.
2. USABLE WIRE SIZES: AWG 16, 18 AND 20.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + – DECIMALS + – ANGLES + –
DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 16 AUG 65
CHECKED A. Udovich 17 AUG 65
APPROVAL R. Trummer 18 Aug 65
APPROVAL L. Yedinan 10/21/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, SOCKET, ELECTRICAL - CRIMP TYPE, NO. 16

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897347
SCALE NONE
SHEET 1 OF 1

MIL 1077C–P

A, U

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23807		20 OCT 65	WER CW

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS SPECIFIED IN MIL-C-26636.

2. ACCEPTANCE AND INSPECTION:
   - A. CONTACT WITHDRAWAL FORCE:
     - (1) NO. 12 SOCKET CONTACTS: 2 OUNCES, MIN, USING $^{.0931}_{.0930}$ DIA TUNGSTEN CARBIDE TEST PINS PER MS 3197.
     - (2) NO. 16 SOCKET CONTACTS: 2 OUNCES, MIN, USING $^{.0616}_{.0615}$ DIA TUNGSTEN CARBIDE TEST PIN PER MS 3197.
   - B. MARKING:
     - (1) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: LEADED COPPER ALLOY PER MIL-C-26482.
     - (2) SLEEVE (SOCKET): BRASS.
   - B. FINISH (CONTACT BODY): .000030 MIN. GOLD PLATE PER MIL-G-45204, TYPE II, OVER .0002 MIN. COPPER PLATE.
   - C. MECHANICAL REQUIREMENTS:
     - (1) CONTACT RETENTION: 25 POUNDS MIN. AFTER 10 INSERTIONS AND WITHDRAWALS IN EITHER DIRECTION, WITHOUT DISPLACEMENT, WHEN INSTALLED IN CONNECTOR.
     - (2) CRIMP TENSILE STRENGTH:
       - (a) NO. 12 CONTACTS: 110 POUNDS MIN. USING NO. 12 AWG STRANDED WIRE; 70 POUNDS MIN. USING NO. 14 AWG STRANDED WIRE.
       - (b) NO. 16 CONTACTS: 50 POUNDS MIN. USING NO. 16 AWG STRANDED WIRE; 38 POUNDS MIN. USING NO. 18 AWG.
   - D. ELECTRICAL REQUIREMENTS:
     - (1) CURRENT RATING:
       - (a) NO. 12 CONTACTS: 40 AMPERES MAX.
       - (b) NO. 16 CONTACTS: 25 AMPERES MAX.
     - (2) CONTACT RESISTANCE:
       - (a) NO. 12 CONTACTS: 22 MILLIVOLTS DC. MAX. AT 35 AMPS USING NO. 12 AWG STRANDED WIRE. TEST PER MIL-C-26636.
       - (b) NO. 16 CONTACTS: 18 MILLIVOLTS DC, MAX. AT 20 AMPS USING NO. 16 AWG STRANDED WIRE. TEST PER MIL-C-26636.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

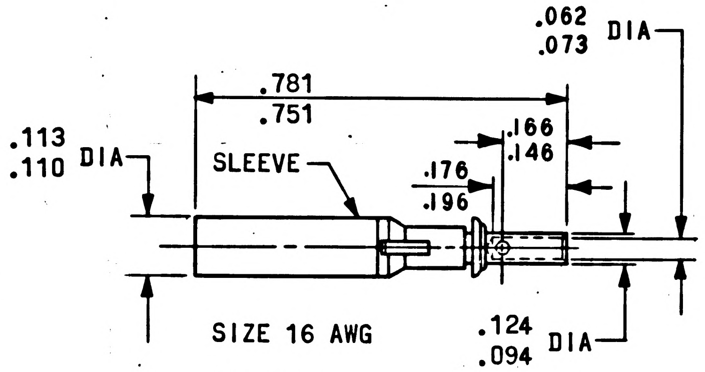


FIGURE 1

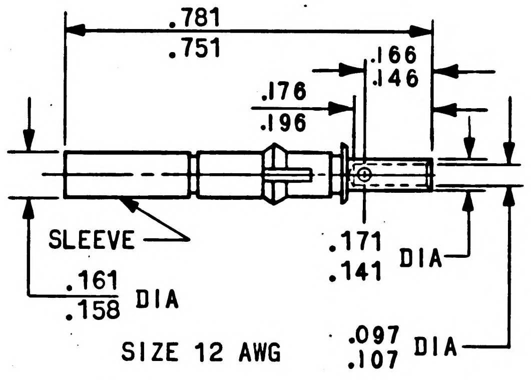


FIGURE 2

DASH NUMBER	FIG NO.	CONTACT SIZE	FOR USE WITH CONNECTOR SERIES (REF)	MANUFACTURER'S PART NUMBER (REF)
-001	1	NO. 16 AWG	DS	200-16/30-3
-002	2	NO. 12 AWG	DS	200-12/30-3

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 17 AUG 65
CHECKED Ed Foster 18 AUG 65
APPROVAL R. Trummer 19 Aug 65
APPROVAL L Gedman 10/26/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W Kupfer 4 Nov 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL - CRIMP TYPE,
NO. 16 AND NO. 12

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897348
SCALE NONE
SHEET 1 OF 1

MIL 1077C-P

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
REVISIONS					
Ⓜ A		INITIAL RELEASE CLASS A PER TDRR 23807		20 OCT 65	WRR CW
B		REVISED PER TDRR 26626		2 FEB 66	JMP JAJ

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS SPECIFIED IN MIL-C-26636.

2. ACCEPTANCE AND INSPECTION:
   - A. CONTACT WITHDRAWAL FORCE:
     - (1) NO. 12 SOCKET CONTACTS: 2 OUNCES, MIN, USING $^{.0931}_{.0930}$ DIA TUNGSTEN CARBIDE TEST PINS PER MS 3197.
     - (2) NO. 16 SOCKET CONTACTS: 2 OUNCES, MIN, USING $^{.0616}_{.0615}$ DIA TUNGSTEN CARBIDE TEST PIN PER MS 3197.
   - B. MARKING:
     - (1) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - DATE CODE OR DATE OF MANUFACTURE
       - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
   - A. MATERIAL:
     - (1) BODY: LEADED COPPER ALLOY PER MIL-C-26482.
     - (2) SLEEVE (SOCKET): BRASS.
   - B. FINISH (CONTACT BODY): .000030 MIN. GOLD PLATE PER MIL-G-45204, TYPE II, OVER .0002 MIN. SILVER PLATE.
   - C. MECHANICAL REQUIREMENTS:
     - (1) CONTACT RETENTION: 25 POUNDS MIN. AFTER 10 INSERTIONS AND WITHDRAWALS IN EITHER DIRECTION, WITHOUT DISPLACEMENT, WHEN INSTALLED IN CONNECTOR.
     - (2) CRIMP TENSILE STRENGTH:
       - (a) NO. 12 CONTACTS: 110 POUNDS MIN. USING NO. 12 AWG STRANDED WIRE; 70 POUNDS MIN. USING NO. 14 AWG STRANDED WIRE.
       - (b) NO. 16 CONTACTS: 50 POUNDS MIN. USING NO. 16 AWG STRANDED WIRE; 38 POUNDS MIN. USING NO. 18 AWG.
   - D. ELECTRICAL REQUIREMENTS:
     - (1) CURRENT RATING:
       - (a) NO. 12 CONTACTS: 40 AMPERES MAX.
       - (b) NO. 16 CONTACTS: 25 AMPERES MAX.
     - (2) CONTACT RESISTANCE:
       - (a) NO. 12 CONTACTS: 22 MILLIVOLTS DC. MAX. AT 35 AMPS USING NO. 12 AWG STRANDED WIRE. TEST PER MIL-C-26636.
       - (b) NO. 16 CONTACTS: 18 MILLIVOLTS DC, MAX. AT 20 AMPS USING NO. 16 AWG STRANDED WIRE. TEST PER MIL-C-26636.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

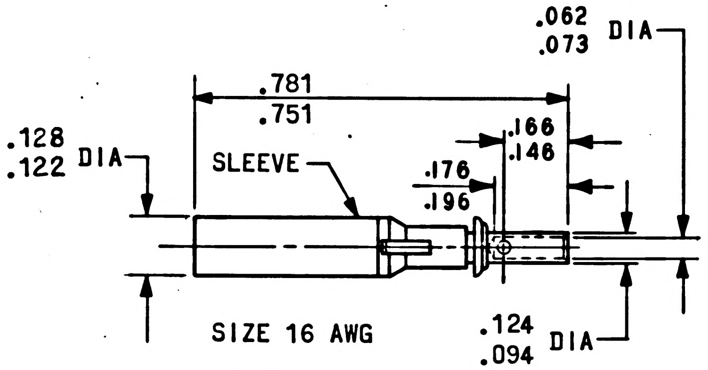


FIGURE 1

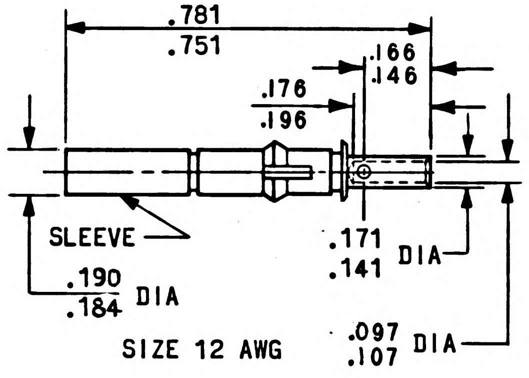


FIGURE 2

DASH NUMBER	FIG NO.	CONTACT SIZE	FOR USE WITH CONNECTOR SERIES (REF)	MANUFACTURER'S PART NUMBER (REF)
-001	1	NO. 16 AWG	DS	200-16/30-3
-002	2	NO. 12 AWG	DS	200-12/30-3

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS
DRAWN S. Amyx DATE 17 AUG 65
CHECKED Ed Foster 18 AUG 65
APPROVAL R. Trummer 19 Aug 65
APPROVAL L Gedeman 10/26/65
NASA APPROVAL A. C. METZGER
MIT APPROVAL W Kupka 4 Nov 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL - CRIMP TYPE,
NO. 16 AND NO. 12

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897348
SCALE NONE
SHEET 1 OF 1

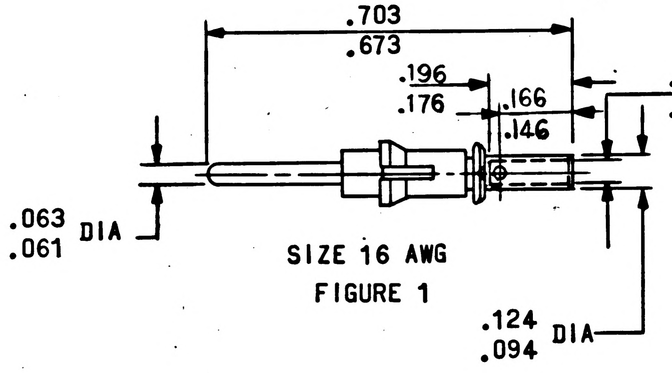
REVISIONS 23392					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23392		10-18-65	MRC

REQUIREMENTS:

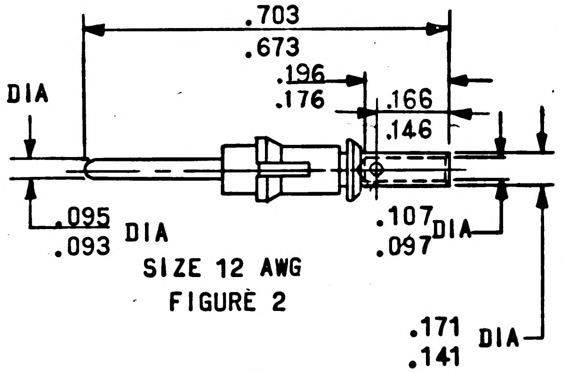
1. GENERAL:
    - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
    - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
    - C. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE QUALIFICATION REQUIREMENTS SPECIFIED IN MIL-C-26636.

2. ACCEPTANCE AND INSPECTION:
    - A. MARKING:
        - (1) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
            - SUPPLIER'S NAME
            - NASA PART NUMBER
            - DATE CODE OR DATE OF MANUFACTURE
            - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
    - A. MATERIAL:
        - (1) BODY: LEADED COPPER ALLOY PER MIL-C-26482.
    - B. FINISH (CONTACT BODY): .000030 MIN. GOLD PLATE PER MIL-G-45204, TYPE II, OVER .0002 MIN. COPPER PLATE.
    - C. MECHANICAL REQUIREMENTS:
        - (1) CONTACT RETENTION: 25 POUNDS MIN. AFTER 10 INSERTIONS AND WITHDRAWALS IN EITHER DIRECTION, WITHOUT DISPLACEMENT, WHEN INSTALLED IN CONNECTOR.
        - (2) CRIMP TENSILE STRENGTH:
            - (a) NO. 12 CONTACTS: 110 POUNDS MIN. USING NO. 12 AWG STRANDED WIRE; 70 POUNDS MIN. USING NO. 14 AWG STRANDED WIRE.
            - (b) NO. 16 CONTACTS: 50 POUNDS MIN. USING NO. 16 AWG STRANDED WIRE; 38 POUNDS MIN. USING NO. 18 AWG.
    - D. ELECTRICAL REQUIREMENTS:
        - (1) CURRENT RATING:
            - (a) NO. 12 CONTACTS: 40 AMPERES MAX.
            - (b) NO. 16 CONTACTS: 25 AMPERES MAX.
        - (2) CONTACT RESISTANCE:
            - (a) NO. 12 CONTACTS: 22 MILLIVOLTS DC. MAX. AT 35 AMPS USING NO. 12 AWG STRANDED WIRE. TEST PER MIL-C-26636.
            - (b) NO. 16 CONTACTS: 18 MILLIVOLTS DC, MAX. AT 20 AMPS USING NO. 16 AWG STRANDED WIRE. TEST PER MIL-C-26636.



SIZE 16 AWG
FIGURE 1



SIZE 12 AWG
FIGURE 2

DASH NUMBER	FIG NO.	CONTACT SIZE	FOR USE WITH CONNECTOR SERIES (REF)	MANUFACTURER'S PART NUMBER (REF)
-001	1	NO. 16 AWG	DS	800-16/32-1
-002	2	NO. 12 AWG	DS	800-12/32-1

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. Patterson DATE 16 AUG 65
CHECKED A. Udovich 17 AUG 65
APPROVAL R. Trummer 19 Aug 65
APPROVAL L. Gediman 10/21/65
NASA APPROVAL
MIT APPROVAL 10/21/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTACT, ELECTRICAL - CRIMP TYPE, NO. 16 AND NO. 12

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897349
SCALE NONE
SHEET 1 OF 1

MIL 1077C-P

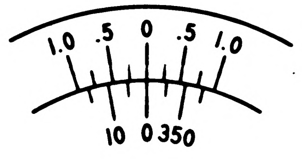
REVISIONS		~~23418~~			
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23418		18 OCT. 65	W.R.B.

REQUIREMENTS:

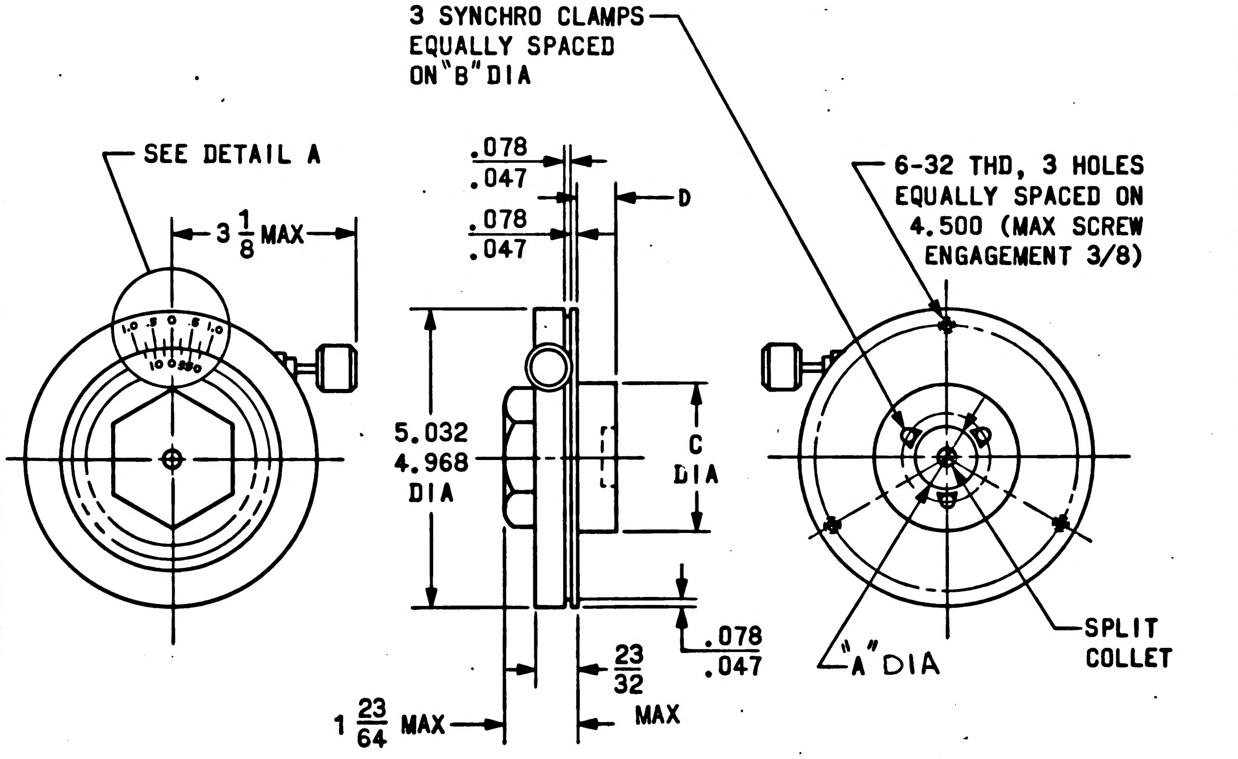
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
     - (2) PACKAGE(S): SHALL BE MARKED, PER MIL-STD-129, WITH THE SUPPLIERS NAME AND NASA PART NUMBER.
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. MATERIAL: ALUMINUM
   - B. FINISH: BLACK ANODIZE
   - C. RATIO, VERNIER KNOB TO OUTPUT SHAFT 1440:1 APPROXIMATELY
   - D. CLOCKWISE ROTATION PRODUCES INCREASING NUMBERS.


1.0 .5 0 .5 1.0
10 0 350

DETAIL A


3 SYNCHRO CLAMPS EQUALLY SPACED ON "B" DIA
SEE DETAIL A
$3\frac{1}{8}$ MAX
.078
.047
.078
.047
D
6-32 THD, 3 HOLES EQUALLY SPACED ON 4.500 (MAX SCREW ENGAGEMENT 3/8)
5.032
4.968
DIA
C
DIA
.078
.047
$\frac{23}{32}$
MAX
$1\frac{23}{64}$ MAX
"A" DIA
SPLIT COLLET

NASA DASH NUMBER	DIA "A"	DIA "B"	C	D	COMPONENT		ROTATION	MANUFACTURER'S PART NUMBER (REF)
					SIZE	SHAFT DIA. (NOMINAL)		
-001	.825 .815	1.200 1.190	2.475 2.445	.688 MAX	10	.090	CW	DR-10-.090
-002	1.015 1.005	1.330 1.320	2.475 2.445	.688 MAX	11	.120	CW	DR-11-.120
-003	1.327 1.317	1.698 1.688	2.475 2.445	.688 MAX	15	.125	CW	DR-15-.125
-004	1.567 1.557	2.013 2.003	2.475 2.445	.688 MAX	18	.1875	CW	DR-18-.1875
-005	2.013 2.003	2.531 2.521	2.890 2.860	.985 MAX	23	.2405	CW	DR-23-.2405
-006	2.326 2.316	2.750 2.740	3.015 2.985	.985 MAX	25	.250	CW	DR-25-.250

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ± __ ANGLES ± __
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bender DATE 20-AUG-65
CHECKED Wilson 24 AUG 65
APPROVAL J. V. WEAN 24 AUG 65
APPROVAL 10-11-65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DIAL, CONTROL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897352
SCALE —
SHEET 1 of 1

C.W

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 24569		5 NOV 65	RP

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER PROCESS AND QUALITY CONTROL. INCLUDING FINAL TESTING, SHALL BE IN ACCORDANCE WITH MIL-Q-9858.
   - C. EACH SHIPPING AND UNIT CONTAINER SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, ITEM NAME, NASA DRAWING NUMBER, NET CONTENTS, LOT NUMBER, AND DATE OF MANUFACTURE.

2. ACCEPTANCE AND INSPECTION:
   - A. MATERIAL: THE MATERIAL COVERED BY THIS SPECIFICATION SHALL BE A CHLORINATED NATURAL RUBBER BASED COMPOUND SUITABLE FOR SPRAY AND KNIFE APPLICATION FOR FILLING CASTING SURFACE IRREGULARITIES.
   - B. PROPERTIES: THE PROPERTIES OF THE MATERIALS SPECIFIED HEREIN SHALL COMPLY WITH THE REQUIREMENTS LISTED IN TABLE I.

3. DESIGN:
   - A. SHELF LIFE: THE MATERIAL SHALL HAVE A MINIMUM SHELF LIFE OF 12 MONTHS FROM THE DATE OF MANUFACTURE AND SHALL HAVE A MINIMUM OF 11 MONTHS SHELF LIFE REMAINING ON RECEIPT BY THE PURCHASER WHEN STORED IN THE UNOPENED CONTAINERS AT TEMPERATURES NOT EXCEEDING 85°F.
   - B. APPLICATION CHARACTERISTICS:
     - (1) THE SPRAY GRADE GLAZE FILLER 1897353-1, SHALL BE CAPABLE OF SPRAY APPLICATION WITH CONVENTIONAL PAINT SPRAY EQUIPMENT.
     - (2) THE KNIFE GRADE GLAZE FILLER 1897353-2 SHALL BE CAPABLE OF APPLICATION WITH A BROAD KNIFE OR RUBBER SQUEEGEE APPLICATOR AND SHALL REMAIN WORKABLE ON THE APPLIED SURFACE FOR A MINIMUM OF 20 KNIFE STROKES WITHOUT TENDENCY TO PULL OR ROLL.
   - C. CURE PROPERTIES: 1897353-1 AND 1897353-2 GLAZE FILLERS SHALL BE CAPABLE OF COMPLETELY AIR DRYING AT ROOM TEMPERATURE WITHIN 16 HOURS AND THE RESULTANT FILM SHALL SAND FREELY USING A NO. 320 GRIT PAPER.
   - D. INTENDED USE: THE MATERIALS SPECIFIED HEREIN ARE INTENDED TO BE USED AS PART OF A CASTING SURFACE FINISHING SYSTEM TO PROVIDE A UNIFORM SMOOTH SURFACE PRIOR TO APPLICATION OF COATING COMPOUND 1016234 AND SUBSEQUENT TOP COATING.

TABLE I

DASH NUMBER	GRADE	COLOR (VISUAL)	PERCENT SOLIDS ASTM D1644	DENSITY (LB/GAL) ASTM D1475	VISCOSITY ASTM D562 (SEE NOTE 1)
-1	SPRAY	GRAY	56.12±2	10.89±0.25	31 TO 36
-2	KNIFE	GRAY	77.81±2	13.62±0.40	HEAVY CONSISTENCY NOT MEASURABLE

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. TIME IN SECONDS FOR 100 REVOLUTIONS OF THE ROTOR AGAINST A 100 GRAM LOAD.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + ___ − DECIMALS + ___ − ANGLES + ___ −
DO NOT SCALE THIS DRAWING
MATERIAL ______
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 27 AUG 65
CHECKED G. Ulrich 2 SEP 65
APPROVAL 2 SEP 65
APPROVAL 11-30-65
NASA APPROVAL A. C. METZGER
MIT APPROVAL 7 Dec 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FILLER, GLAZE, RUBBER BASE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897353
SCALE ——
SHEET 1 OF 1

MIL 1077C-P

40

1897356

REVISIONS 23919					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23419		19OCT 65	FE

REQUIREMENTS:

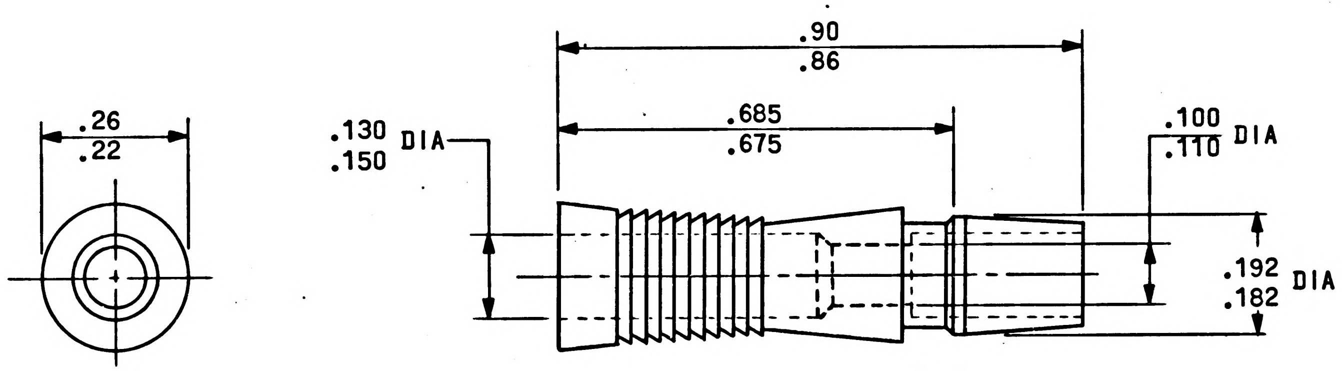
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. PRESERVATION, PACKAGING, PACKING AND CONTAINER MARKING: PER ND 1002215, CLASS 1, CODE 7.
   - D. CONTACTS MUST BE PROCURED SEPARATELY. REFERENCE SCD 1016369 FOR CONTACTS.

2. DESIGN:
   - A. MATERIAL: NYLON PER MIL-M-20693, TYPE 1.
   - B. COLOR: NATURAL (WHITE).

3. APPLICATION DATA:
   - A. PART MATES WITH SCD 1897357.

DASH NUMBER	MANUFACTURER'S PART NUMBER (REFERENCE)
-001	RSCDEX-2

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Amyx DATE 27 AUG 65
CHECKED C. Udovich 1 SEP 65
APPROVAL 1 SEP 65
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RETAINER, ELECTRICAL CONNECTOR - COAXIAL, PIN

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897356
SCALE NONE
SHEET 1 OF 1

MIL 1077C—P

1897356 A

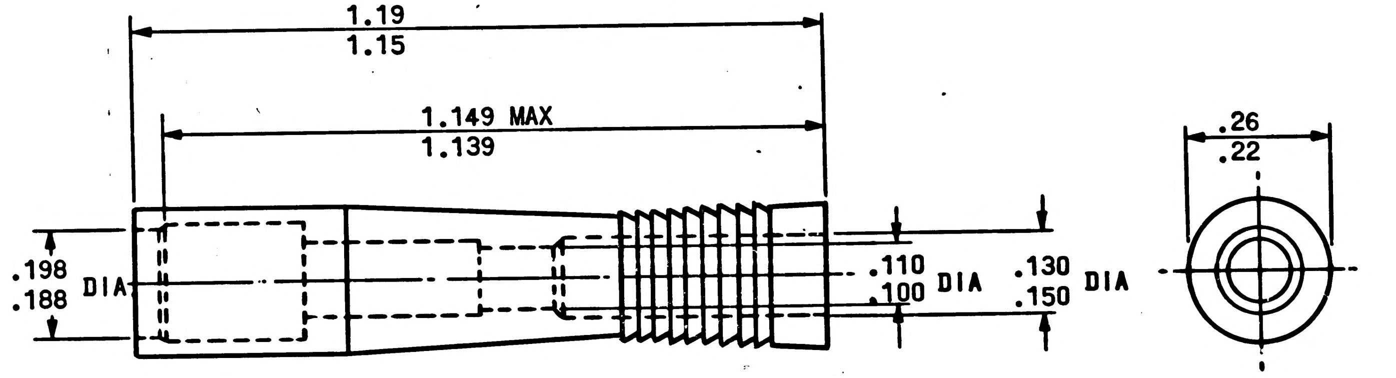
REVISIONS 23419					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 23419		19 OCT 65	LF

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. CONTACTS MUST BE PROCURED SEPARATELY. REFERENCE SCD 1016369 FOR CONTACTS.
   - D. PRESERVATION, PACKAGING, PACKING AND CONTAINER MARKING: PER ND 1002215, CLASS 1, CODE 7.
2. DESIGN:
   - A. MATERIAL: NYLON PER MIL-M-20693, TYPE 1.
   - B. COLOR: NATURAL (WHITE)
3. APPLICATION DATA:
   - A. PART MATES WITH SCD 1897356.

DASH NUMBER	MANUFACTURER'S PART NUMBER (REFERENCE)
-001	RSMDEX-2

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + _ − DECIMALS + _ − ANGLES + _ −
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Janowiak DATE 1 SEP 65
CHECKED A. Udovich 2 SEP 65
APPROVAL 3 SEP 65
APPROVAL 10/19/65
NASA APPROVAL
MIT APPROVAL 21 Oct 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RETAINER, ELECTRICAL CONNECTOR - COAXIAL, SOCKET

SPECIFICATION CONTROL DRAWING

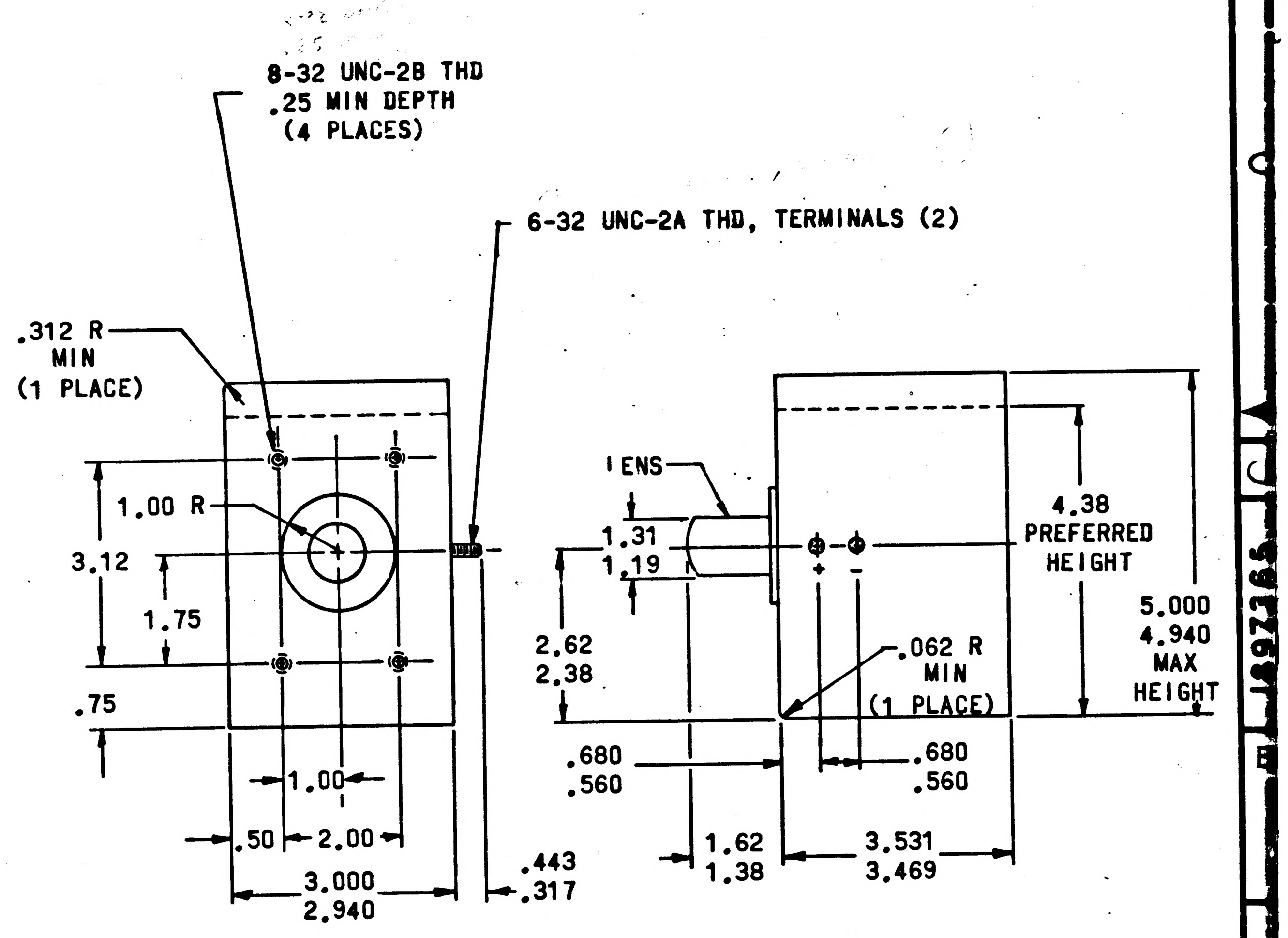
CODE IDENT NO.	SIZE	
99974	C	1897357
SCALE NONE		SHEET 1 OF 1

MIL 1077C—P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		① REVISED PER MXC 206665		15 NOV 65	
B		REVISED PER MXC 207331	–	3 DEC 65	JJJ CP
C		UPGRADED TO CLASS A PER TDRR 25325	–	6 DEC 65	JJJ

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. PARTS USED, PARTS SOURCES, AND OTHER MATERIAL ARE SUBJECT TO APPROVAL BY THE PROCURING ACTIVITY.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL:
     - (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME OR SYMBOL AND THE NASA PART NUMBER. TERMINALS SHALL BE PERMANENTLY AND LEGIBLY MARKED TO INDICATE POLARITY.
     - (2) WEIGHT: APPROXIMATELY 2 POUNDS.
     - (3) HARDWARE TO BE SUPPLIED BY VENDOR TO INCLUDE 2 6-32 NUTS, 2 FLAT WASHERS AND 2 INTERNAL TOOTH LOCK WASHERS FOR TERMINALS.
     - (4) LENS TO BE CLEAR WITH 180° MIN VIEWING ANGLE.
   - B. ELECTRICAL:
     - (1) POWER INPUT: 28 VDC ±20%; 0.4 A NOM.
     - (2) FLASH RATE: 50/MINUTE NOM.
     - (3) THERE SHALL BE NO ELECTRICAL CONTINUITY BETWEEN THE CASE AND THE INPUT TERMINALS (1 MEGOHM MIN).
3. DESIGN:
   - A. ENVIRONMENTS:
     - (1) UNIT SHALL WITHSTAND WITHOUT BREAKDOWN AND BE CAPABLE OF PROPER OPERATION DURING AND/OR AFTER THE FOLLOWING ENVIRONMENTS PER MIL-E-5272.
       - (a) HUMIDITY: 5 CYCLES NON-OPERATING.
       - (b) TEMPERATURE: -40°C TO +71°C NON-OPERATING. +20°C TO +50°C OPERATING.
       - (c) VIBRATION: 10 TO 500 CPS AT 10 G NON-OPERATING.
       - (d) SHOCK: 20 G AT 11 ± 1 MILLISECONDS NON-OPERATING.
   - B. REQUIREMENTS:
     - (1) LAMP INTENSITY: 2 JOULES NOM.


8-32 UNC-2B THD
.25 MIN DEPTH
(4 PLACES)
6-32 UNC-2A THD, TERMINALS (2)
.312 R
MIN
(1 PLACE)
1.00 R
3.12
1.75
.75
1.00
.50
2.00
3.000
2.940
.443
.317
LENS
1.31
1.19
2.62
2.38
+
–
.062 R
MIN
(1 PLACE)
.680
.560
.680
.560
1.62
1.38
3.531
3.469
4.38
PREFERRED
HEIGHT
5.000
4.940
MAX
HEIGHT

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.02	+ —
– —	±.005	– —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT Contract NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

DRAWN J. Kowalski DATE 15 SEP 65
CHECKED Ed Foster 17 SEP 65
APPROVAL G.A. Hoffman 17 SEP 65
APPROVAL J. M. Watson 1-4-66
NASA APPROVAL A. C. METZGER
MIT APPROVAL 18 Jan 66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FLASHER, WARNING, XENON -
SOLID STATE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897365
SCALE
SHEET 1 OF 1

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 25565		13 DEC 65	JRC Aud

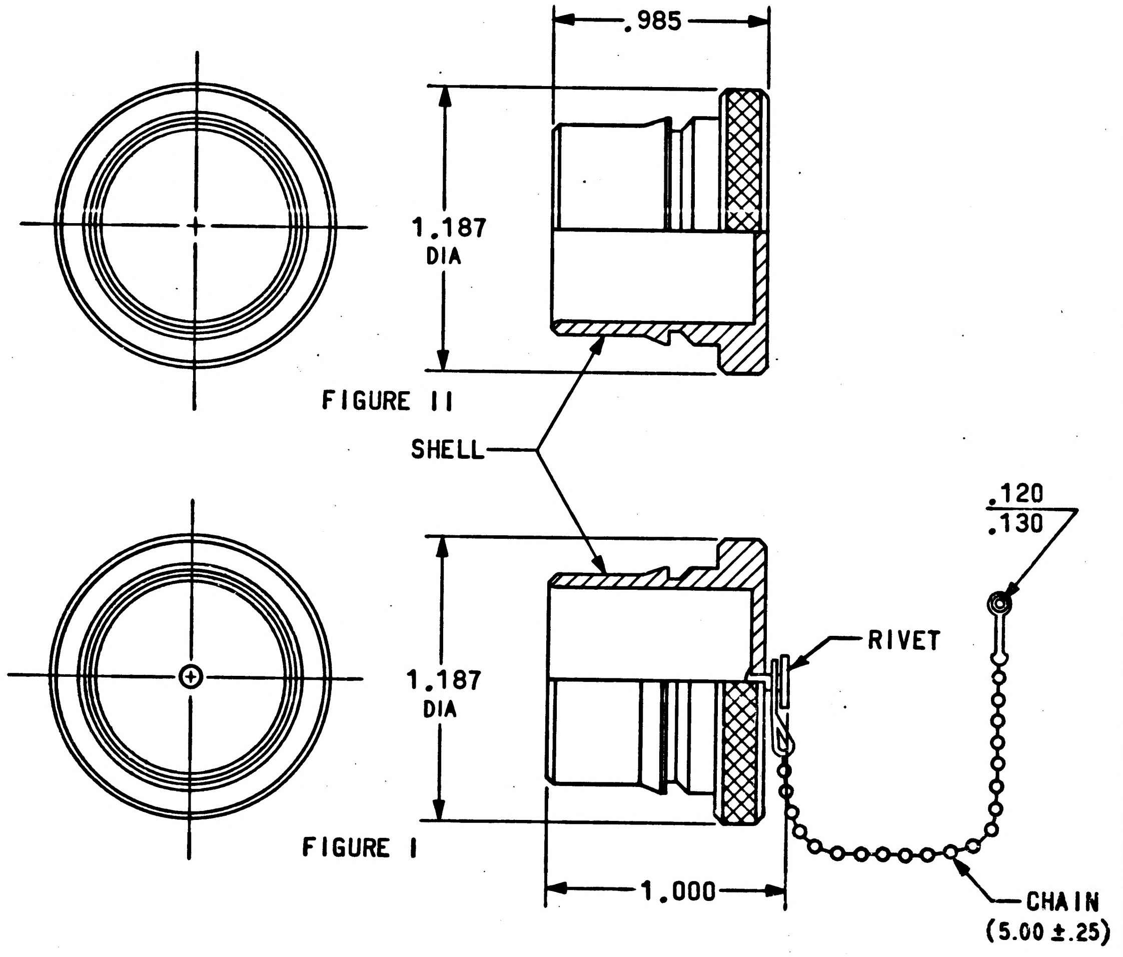
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - MANUFACTURER'S NAME AND/OR SYMBOL
       - NASA PART NUMBER
     - (3) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MATERIAL:
       - (a) SHELL: ALUMINUM ALLOY PER QQ-A-225/5, T4.
       - (b) RIVET: ALUMINUM ALLOY PER QQ-A-225/6, T4.
       - (c) CHAIN: BRASS, FREE MACHINING
     - (2) FINISH:
       - (a) SHELL: PER TABLE
       - (b) CHAIN AND RIVET: CLEAR CADMIUM PLATE (.0002-.0004) PER QQ-P-416, TYPE II.

NASA DASH NUMBER	FIG. NO.	MATERIAL FINISH	FOR USE WITH CONNECTOR (REF)	MANUFACTURER'S PART NUMBER (REF)
-001	I	CLEAR ANODIZE	1897180	086-0054
-002	II		1010782, 1010965, 1897180	086-0055
-003	I	BLACK ANODIZE	1897366	086-0081
-004	II		1897366	086-0082



THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.020 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bender DATE 14-OCT-65
CHECKED Ed Foster 19 OCT 65
APPROVAL R. Trummer 19 Oct 65
APPROVAL L. Feldman 1/24/66
NASA APPROVAL A. C. METZGER
MIT APPROVAL MG Hurley 1-25-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COVER, ELECTRICAL
CONNECTOR

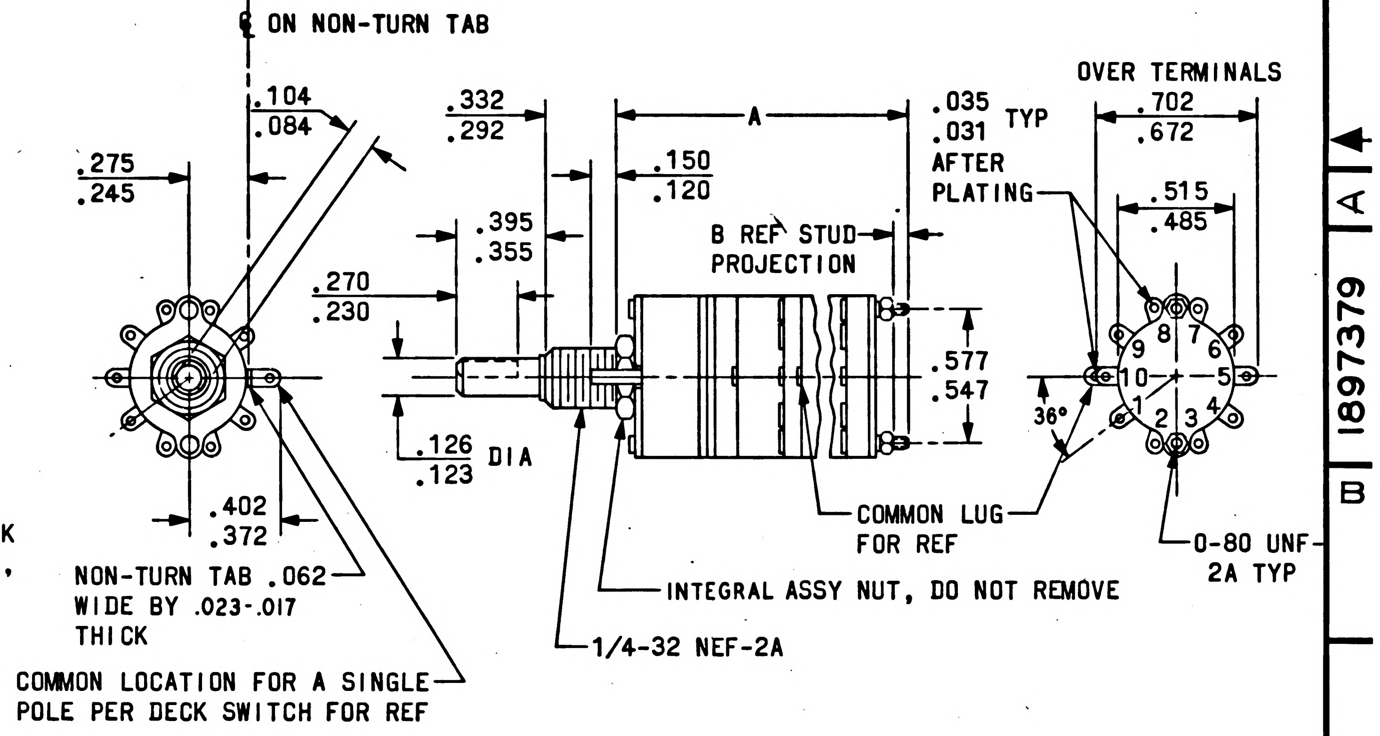
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897377
SCALE NONE
SHEET 1 of 1

REVISIONS					
SYM	ZONE	DESCRIPTION		DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 28578	CHG NO.	2 MAY 66	RLP EF

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING:
       - (a) PIECEMARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130 WITH THE FOLLOWING INFORMATION:
         - NASA PART NUMBER
         - MANUFACTURER'S NAME OR TRADEMARK
         - TERMINAL AND CONTACT LOCATIONS SHALL BE MARKED ON BACK PLATE.
       - (b) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED PER MIL-STD-129 WITH THE FOLLOWING INFORMATION:
         - NASA PART NUMBER
         - MANUFACTURER'S NAME OR TRADEMARK
       - (c) MANUFACTURER'S PART NUMBER, LOT OR SERIAL NUMBER, AND DATE CODE OR DATE OF MANUFACTURE MAY APPEAR ON THE PART OR PACKAGE.
     - (2) TERMINALS: COMMON TERMINALS FOR SINGLE POLE DECKS SHALL BE AT LOCATION 10; COMMON TERMINALS FOR 2-POLE DECKS SHALL BE AT LOCATIONS 1 AND 6; ALL BASE TERMINALS SHALL BE IN CONSECUTIVE LOCATIONS STARTING WITH FIRST TERMINAL IN LOCATION 1. PROVISION OF TERMINALS IN POSITIONS NOT USED IS OPTIONAL.
     - (3) SHAFT FLAT: SHALL BE OPPOSITE CONTACTING POSITION OF POLE NUMBER ONE.
     - (4) INDEX: 36°, WITH POSITIVE DETENT POSITIONING ACTION.
     - (5) ROTATION: NON-ADJUSTABLE STOPS SHALL BE POSITIONED SUCH THAT MECHANICAL ROTATION OF THE SWITCH IS LIMITED TO THE NUMBER OF POSITIONS SPECIFIED PER TABLE, WITHOUT OBJECTIONABLE OVERTRAVEL.
     - (6) MOUNTING HARDWARE: TWO 1/4-32 NEF-2B HEX NUTS, .062 THICK AND 5/16 ACROSS FLATS; ONE INTERNAL TOOTH LOCKWASHER; AND, WHEN REQUIRED, TWO NO. 0-80 UNF-2B HEX NUTS, .046 THICK AND .125 ACROSS FLATS (FOR REAR END MOUNTING) TO BE FURNISHED WITH THE SWITCH.


℄ ON NON-TURN TAB
.104
.084
.275
.245
.332
.292
.395
.355
.270
.230
.150
.120
A
.035
.031 TYP
AFTER PLATING
OVER TERMINALS
.702
.672
.515
.485
B REF STUD PROJECTION
.577
.547
.126
.123 DIA
36°
1
2
3
4
5
6
7
8
9
10
.402
.372
NON-TURN TAB .062 WIDE BY .023-.017 THICK
COMMON LOCATION FOR A SINGLE POLE PER DECK SWITCH FOR REF
COMMON LUG FOR REF
INTEGRAL ASSY NUT, DO NOT REMOVE
1/4-32 NEF-2A
0-80 UNF-2A TYP

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± —	± .005	± —

DO NOT SCALE THIS DRAWING

MATERIAL SEE REQUIREMENTS

CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS

DRAWN Bender DATE 26-OCT-65
CHECKED Dayles 27 OCT 65
APPROVAL 28 OCT 65
APPROVAL 5/4/66
NASA APPROVAL 5/4/66
MIT APPROVAL 5-4-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 | SIZE C | 1897379

SCALE FULL | SHEET 1 OF 3

MIL 1077C—P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 28598		2 MAY 66	RP / EF

REQUIREMENTS: (CONTINUED)

B. ELECTRICAL REQUIREMENTS:

(1) CIRCUIT CONFIGURATION: SHALL BE AS SHOWN IN TABLE WITH NON-SHORTING CONTACTS.

(2) CONTACT RESISTANCE: SHALL NOT EXCEED .020 OHMS INITIALLY BETWEEN ANY TWO CONTACTS IN THE MAKE POSITION WHEN TESTED WITH A TEST CURRENT OF 100 MILLIAMPERES AND AN OPEN-CIRCUIT TEST VOLTAGE OF 2 VOLTS.

(3) INSULATION RESISTANCE: SHALL BE NOT LESS THAN 1000 MEGOHMS. A DC MEASURING POTENTIAL OF 100 VOLTS SHALL BE APPLIED; FIRST, BETWEEN ANY TWO ADJACENT TERMINALS WHICH ARE AT MINIMUM SPACING AND SECOND, BETWEEN TWO ADJACENT TERMINALS AT MINIMUM SPACING, WHICH ARE DIAMETRICALLY OPPOSITE THE FIRST TWO TERMINALS, IF POSSIBLE.

(4) DIELECTRIC STRENGTH: SHALL WITHSTAND, WITHOUT BREAKDOWN OR FLASHOVER, A POTENTIAL OF 1000 VOLTS, 60 CPS (RMS) INITIALLY BETWEEN ADJACENT CURRENT CARRYING PARTS AND GROUND AND BETWEEN ANY TWO ADJACENT UNCONNECTED TERMINALS FOR 5 SECONDS.

3. DESIGN:

A. CONTACT RATING:

(1) MAKE AND BREAK:
1/4 AMP AT 115 V AC RESISTIVE
1/4 AMP AT 6-28V DC RESISTIVE
.020 AMP AT 115 V DC RESISTIVE
.050 AMP AT 115 V AC INDUCTIVE

(2) CARRY: 4 AMPS CONTINUOUS.

B. CONTACT RESISTANCE: SHALL BE .020 OHMS MAXIMUM INITIALLY AND .060 OHMS MAXIMUM AFTER EXPOSURE TO ENVIRONMENTS, AND DURING OR AFTER 25,000 CYCLES OF OPERATION.

C. VOLTAGE BREAKDOWN: AFTER ENVIRONMENTAL EXPOSURE OR LIFE, SHALL WITHSTAND, WITHOUT BREAKDOWN OR FLASHOVER, A POTENTIAL OF 500 VOLTS, 60 CPS (RMS), FOR ONE MINUTE.

D. LIFE: SHALL BE CAPABLE OF PERFORMING 25,000 ROTARY CYCLES MINIMUM. AFTER LIFE THE SWITCH SHALL BE ELECTRICALLY AND MECHANICALLY FUNCTIONAL AND SHALL BE CAPABLE OF PASSING THE CONTACT RESISTANCE (PARA. 3.B.) AND VOLTAGE BREAKDOWN (PARA. 3.C.) REQUIREMENTS.

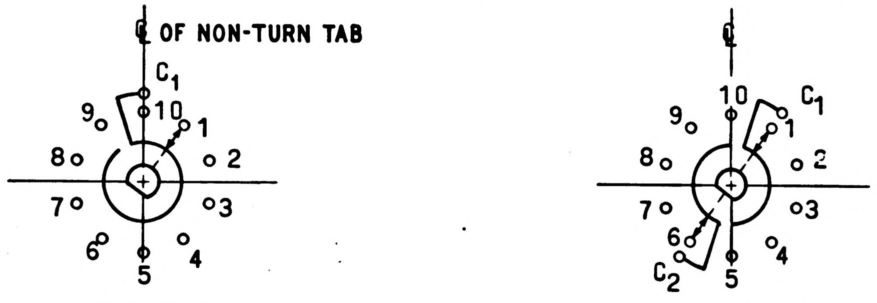
E. STOP STRENGTH: 12 POUND-INCHES MINIMUM.

F. ROTATIONAL TORQUE: SHALL BE AS SHOWN IN TABLE.

G. REAR END MOUNTING PROVISION: ALL SWITCHES HAVING 6 SECTIONS OR MORE SHALL HAVE THRU BOLTS EXTENDED .250 INCH MINIMUM TO PROVIDE FOR REAR END MOUNTING SUPPORT SUPPLEMENTARY TO THE NORMAL FRONT END BUSHING MOUNT. EXTRA THRU BOLT NUTS SHALL BE PROVIDED WITH THE SWITCH.

CIRCUIT DIAGRAM

SWITCHES VIEWED FROM SHAFT END AND SHOWN IN POSITION NO. 1



ONE POLE

TWO POLE

ALL COMMON TERMINALS ARE LOCATED ABOVE BASE TERMINALS AS SHOWN

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS
DRAWN Bender DATE 26-OCT-65
CHECKED Dayler 27 OCT 65
APPROVAL 28 OCT 65
APPROVAL Bruce 5/4/66
NASA APPROVAL 5/4/66
MIT APPROVAL 5-9-66

MANNED
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HOUSTON, TEXAS

SWITCH, ROTARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974 SIZE C 1897379
SCALE SHEET 2 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		INITIAL RELEASE CLASS A PER TDRR 28598		2 MAY 66	RP EF

REQUIREMENTS: (CONTINUED)

H. MATERIALS AND FINISHES:

(1) SWITCH BASES: MOLDED MELAMINE THERMOSETTING PLASTIC PER MIL-M-14, TYPE CMG.

(2) COVER, DECK SEPARATORS, END PLATE, AND ROTOR MOUNTING PLATE: MOLDED PHENOLIC PER MIL-M-14, TYPE CFG.

(3) MOUNTING BUSHING AND NUTS: BRASS, CADMIUM PLATED PER QQ-P-416, CLASS 2, TYPE II.

(4) RETAINING RINGS, THROUGH BOLTS, SHAFT EXTENSION, STOP WASHERS, STOP ARM, THRUST WASHERS, DETENT BALLS, COVER PLATE, AND REAR SUPPORT PLATE: 302 STAINLESS STEEL.

(5) SHAFT: 303 STAINLESS STEEL, PASSIVATED.

(6) DETENT SPRINGS: MUSIC WIRE, TINNED.

(7) TERMINALS, STATOR CONTACTS, AND COMMON PLATE: BRASS WITH GOLD FLASH .00001 INCH MINIMUM THICKNESS OVER .0003 INCH MINIMUM SILVER PLATE.

(8) ROTOR CONTACT: SILVER ALLOY WITH GOLD FLASH .00001 INCH MINIMUM THICKNESS.

DASH NUMBER	NUMBER OF DECKS	POLES PER DECK	TOTAL NUMBER OF POLES	POS PER POLE	MAX ROTATION TORQUE (OZ.IN.)	DIMENSIONS		MANUFACTURER'S PART NUMBER (FOR REF)
						A	B REF	
-001	1	1	1	6	15	1.01 .94	.062	8A36-1-1-6N

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

DRAWN Bender DATE 26-OCT-65
CHECKED 27 OCT 65
APPROVAL 28 OCT 65
APPROVAL 5/4/66
NASA APPROVAL 5/4/66
MIT APPROVAL 5-9-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, ROTARY

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. 99974
SIZE C
1897379
SCALE
SHEET 3 OF 3

MIL 1077C—P

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28593	2 MAY 66	DKB E +

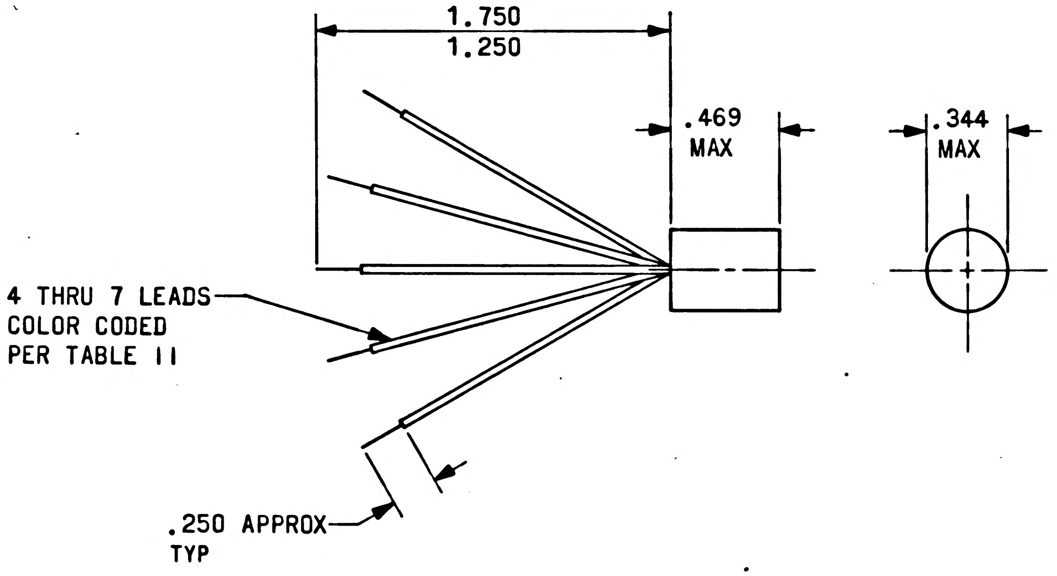
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. DESIGN TO BE IN CONFORMANCE WITH SPECIFICATION MIL-T-27.
   - D. UNITED TRANSFORMER CO. PART NUMBER PER TABLE II.

2. INSPECTION AND ACCEPTANCE:
   - A. UNIT SHALL MEET ALL REQUIREMENTS OF TABLE I.
   - B. COLOR: UNIT SHALL BE FINISHED WITH COLOR 514 OF ANA BULLETIN 157 (INSTRUMENT BLACK).
   - C. MARKING: MARK PERMANENTLY AND LEGIBLY PER ND 1002019 WITH THE LAST THREE DIGITS OF THE NASA DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART AND PACKAGE.
   - D. LEADS SHALL BE 0.016 ± .001 DUMET PER TYPE D OF MIL-STD-1276, WITH PLASTIC INSULATION. ENDS SHALL BE STRIPPED AS SHOWN.

3. DESIGN:
   - A. THE UNIT SHALL MEET ALL REQUIREMENTS OF MIL-T-27 FOR GRADE 4, CLASS R, LIFE EXPECTANCY X FAMILY 01 IN AN AMBIENT TEMPERATURE OF 65°C EXCEPT MARKING.
   - B. ALTITUDE: 10,000 FEET OPERATING, 50,000 FEET NON-OPERATING.
   - C. AMBIENT OPERATING TEMPERATURE RANGE: 0°C TO +65°C.
   - D. DC UNBALANCE IN PRIMARY: PER TABLE II.
   - E. SOLDER USED FOR ELECTRICAL CONNECTIONS SHALL BE COMPOSITION SN 60 PER QQ-S-571C.
   - F. RATED POWER LEVEL: PER TABLE II
   - G. WEIGHT: 0.1 OUNCE (REF)
   - H. MAXIMUM WORKING VOLTAGE: 50 VOLTS INSTANTANEOUS.

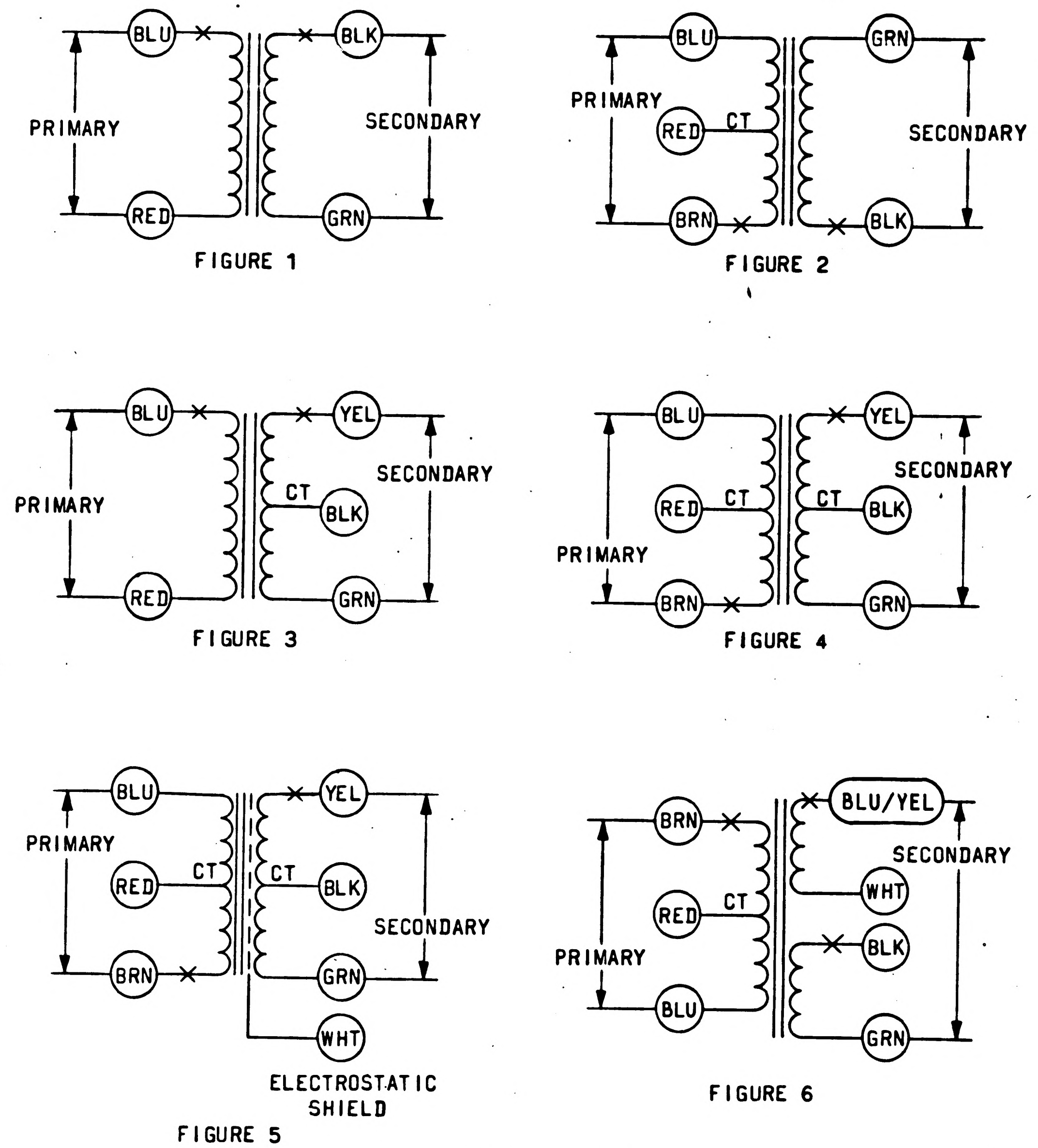
4. SPECIAL CONDITIONING BY MANUFACTURER:
   - A. TRANSFORMER SHALL BE TEMPERATURE CYCLED FOR 5 CYCLES PER MIL-STD-202B METHOD 102A EXCEPT THAT THE TEMPERATURES SHALL BE -55°C, +25°C AND +105°C AND EXPOSURE TIME SHALL BE 15 MINUTES AT EACH TEMPERATURE. DURING THE LAST CYCLE THE UNIT SHALL BE TESTED FOR CONTINUITY AT EACH OF THE AMBIENT CONDITIONS. AFTER STABILIZATION AT ROOM TEMPERATURE UNIT SHALL PASS NORMAL PRODUCTION TESTS.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + – 3 PLACE DECIMALS + – ANGLES + –	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN Bender DATE 3-DEC-65 CHECKED Molye 8-DEC-65 APPROVAL Bruce L Heck 5/4/66 CONTRACT NAS9-497	TRANSFORMER, AUDIO FREQUENCY SPECIFICATION CONTROL DRAWING
MATERIAL SEE REQUIREMENTS	NASA APPROVAL 5/4/66	SIZE C · CODE IDENT NO. 99974 · 1897388
APPROVAL	MIT APPROVAL 5 4 66	SCALE NONE · SHEET 1 of 5

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28598	2 MAY 66	JHP EF


BLU
BLK
PRIMARY
SECONDARY
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BLU
GRN
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BRN
BLU/YEL
SECONDARY
CT
RED
WHT
PRIMARY
BLK
BLU
GRN

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

ELECTROSTATIC SHIELD

FIGURE 5

FIGURE 6

SCHEMATIC DIAGRAMS

VOLTAGES AND CURRENTS ARE RMS VALUES UNLESS OTHERWISE NOTED.

TABLE I

INSPECTION TESTS	
TITLES IN PARAGRAPH COLUMN REFER TO PARAGRAPH TITLES IN SPECIFICATION MIL-T-27	
PARAGRAPH	
DC RESISTANCE	AS INDICATED IN TABLE II AT 25°C.
INDUCTANCE	AS SPECIFIED IN PRIMARY INDUCTANCE COLUMN OF TABLE II MEASURED AT 5 VOLTS. 1000 CPS.
HARMONIC DISTORTION	5% MAXIMUM MEASURED AT 1000 CPS, AND RATED POWER AS SPECIFIED IN TABLE II.
FREQUENCY RESPONSE	(1000 CPS REFERENCE) ± 3 DB FROM 300 CPS TO 20K CPS MEASURED AT 1 MW POWER LEVEL WITH SOURCE AND LOAD IMPEDANCE AND PRIMARY DC CURRENT AS SPECIFIED IN TABLE II.
POLARITY	LEADS INDICATED IN TABLE II SHALL BE OF LIKE POLARITY.
TURNS RATIO	AS SPECIFIED IN NO-LOAD VOLTAGE RATIO COLUMN OF TABLE II, MEASURED AT 5 VOLTS, 5000 CPS.
INDUCED VOLTAGE	APPLY THE VOLTAGE SPECIFIED IN TABLE II AT 2000 CPS TO THE PRIMARY WITH THE SECONDARY OPEN.
SEALING	IMMERSE IN LIQUID AS INDICATED.
DIELECTRIC WITHSTANDING VOLTAGE	APPLY 100 VOLTS (RMS) BETWEEN WINDINGS AND BETWEEN WINDINGS AND CASE EXCEPT 300 VOLTS (RMS) ON DASH NUMBERS -007, -023, -033, AND -040.
INSULATION RESISTANCE	10,000 MEGOHMS MINIMUM AT 25°C. MEASURE WITH 100 VOLTS DC MAXIMUM.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + – 3 PLACE DECIMALS + – ANGLES + –	**AC ELECTRONICS DIVISION** GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN Bender DATE 3-DEC-65 CHECKED Molye 8-DEC-65 APPROVAL Bruce L Hicks 5-4-66 CONTRACT NAS9-497	TRANSFORMER, AUDIO FREQUENCY SPECIFICATION CONTROL DRAWING
MATERIAL	NASA APPROVAL 5-4-66	SIZE C CODE IDENT NO. 99974 1897388
APPROVAL	MIT APPROVAL 5 9 66	SCALE SHEET 2 of 5

MIL-1098C D

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28598	2 MAY 66	JHP / EF

TABLE II

NASA DASH NUMBER	UTC PART NUMBER REF	UTC CATALOG REF	DC RESISTANCE OHMS ± 25% AT 25°C		LEAD COLOR CODING		LEAD POLARITY	FREQUENCY RESPONSE SOURCE AND LOAD IMPEDANCE Ω		PRIMARY OPEN-CIRCUIT INDUCTANCE MIN		NO LOAD VOLTAGE RATIO ±3% PRIMARY:SECONDARY	UNBALANCED DC, MA MAX PRIMARY	RATED POWER LEVEL MILLI-WATTS	MIL-T-27 FAMILY	REF SCHEMATIC DIAGRAM AND TEST CURRENT NUMBER	INDUCED VOLTAGE VOLTS
			PRI.	SEC.	PRI.	SEC.		Z_S	Z_L	HENRIES	DC MA						
-001	JR580	DO-T1	830	115	BLU, RED	BLK, GRN	BLU, BLK	20K	800	2.3	0.5	5:1	0.5	50	13	1	78
-002	JR581	DO-T2	60	8	↓	↓	↓	500	50	.065	3.0	3.16:1	3.0	100	17	1	-
-003	JR582	DO-T3	115	8	↓	↓	↓	1000	50	.11	3.0	4.46:1	3.0	100	13	1	-
-004	JR583	DO-T4	60	0.5	↓	↓	↓	600	3.2	.065	3.0	13.7:1	3.0	100	17	1	-
-005	JR584	DO-T5	105	0.5	↓	↓	↓	1200	3.2	0.12	2.0	19.35:1	2.0	100	13	1	-
-006	JR585	DO-T6	790	0.6	↓	↓	↓	10K	3.2	1.15	1.0	55.7:1	1.0	100	13	1	64
-007	JR586	DO-T7	8500	100	BLK, GRN	RED, BLU	↓	200K	1K	21	0	14.14:1	0	25	16	1(REVERSED)	140
-008	JR587	DO-T9	780	50	BLU, RED	YEL, GRN, BLK (CT)	YEL, BLU	10K	500 CT	1.6	1.0	4.48:1	1.0	100	13	3	70
-009	JR588	DO-T10	780	115	↓	↓	↓	10K	1.2K CT	1.6	1.0	2.89:1	1.0	100	13	3	72
-010	JR589	DO-T11	780	190	↓	↓	↓	10K	2K CT	1.6	1.0	2.24:1	1.0	100	13	3	72
-011	JR590	DO-T12	11	1.5	BLU, BRN, RED (CT)	BLK, GRN	BRN, BLK	150 CT	12	.029	0	3.54:1	10.0	500	17	2	-
-012	JR591	DO-T13	20	1.63	↓	↓	↓	300 CT	12	.06	0	5:1	7.0	500	17	2	-
-013	JR592	DO-T14	43	1.5	↓	↓	↓	600 CT	12	.13	0	7.07:1	5.0	500	17	2	-
-014	JR593	DO-T15	50	1.5	↓	↓	↓	800 CT	12	.16	0	8.15:1	4.0	500	17	2	-
-015	JR594	DO-T16	70	1.5	↓	↓	↓	1K CT	12	.17	0	9.15:1	3.5	500	13	2	52
-016	JR595	DO-T17	108	1.5	↓	↓	↓	1.5K CT	12	.25	0	11.2:1	3.0	500	13	2	64
-017	JR596	DO-T18	505	1.6	↓	↓	↓	7.5K CT	12	1.0	0	25:1	1.0	100	13	2	64
-018	JR597	DO-T19	19	89	↓	↓	↓	300 CT	600	.05	0	1:1.41	7.0	500	17	2	-
-019	JR598	DO-T20	31	90	↓	↓	↓	500 CT	600	.09	0	1:1.1	5.5	500	17	2	-
-020	JR599	DO-T21	53	89	↓	↓	↓	900 CT	600	.18	0	1.22:1	4.0	500	17	2	-
-021	JR600	DO-T22	86	89	↓	↓	↓	1.5K CT	600	.27	0	1.58:1	3.0	500	13	2	56
-022	JR601	DO-T23	830	115	BRN, BLU RED (CT)	YEL, GRN, BLK (CT)	BRN, YEL	20K CT	800 CT	2.3	.5	5:1	.5	50	13	4	78

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS ± · 3 PLACE DECIMALS ± · ANGLES ±	**AC ELECTRONICS DIVISION** GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN Bender DATE 3-DEC-65 CHECKED Molye 8-DEC-65 APPROVAL Bruce L Hich 5/4/66 CONTRACT NAS9-497	TRANSFORMER, AUDIO FREQUENCY SPECIFICATION CONTROL DRAWING
MATERIAL	NASA APPROVAL 5/4/66	SIZE C · CODE IDENT NO. 99974 · 1897388
APPROVAL	MIT APPROVAL 5-9-66	SCALE · SHEET 3 of 5

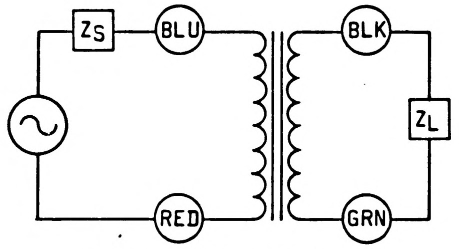
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28598	2 MAY 66	JHP EF

TABLE II (CONTINUED)

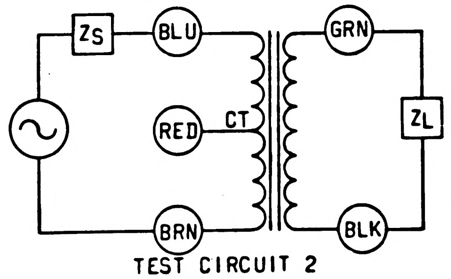
NASA DASH NUMBER	UTC PART NUMBER REF	UTC GATALOG REF	DC RESISTANCE OHMS ± 25% AT 25°C		LEAD COLOR CODING		LEAD POLARITY	FREQUENCY RESPONSE SOURCE AND LOAD IMPEDANCE Ω		PRIMARY OPEN-CIRCUIT INDUCTANCE MIN		NO LOAD VOLTAGE RATIO ±3% PRIMARY: SECONDARY	UN-BALANCE DC, MA MAX PRIMARY	RATED POWER LEVEL MILLI-WATTS	MIL-T-27 FAMILY	REF SCHEMATIC DIAGRAM AND TEST CURRENT NUMBER	INDUCED VOLTAGE VOLTS
			PRI.	SEC.	PRI.	SEC.		Z_S	Z_L	HENRIES	DC MA						
-023	JR602	DO-T24	8500	100	YEL, GRN, BLK (CT)	BRN, BLU, RED (CT)	BRN, YEL	200K CT	1K CT	21	0	14.14:1	0	25	16	4(REVERSED)	140
-024	JB603	DO-T25	780	126	BRN, BLU, RED (CT)	YEL, GRN, BLK (CT)	BRN, YEL	10K CT	1.5K CT	1.6	1.0	2.58:1	1.0	100	13	4	70
-025	JB604	DO-T29	10	.38	BLU, BRN, RED (CT)	BLK, GRN	BRN, BLK	120 CT	3.2	.024	0	6.12:1	10.0	500	17	2	-
-026	JB605	DO-T30	20	.38	↓	↓	↓	320 CT	3.2	.066	0	10:1	7.0	500	17	2	-
-027	JB606	DO-T31	43	.38	↓	↓	↓	640 CT	3.2	.14	0	14.1:1	5.0	500	17	2	-
-028	JB607	DO-T32	51	.38	↓	↓	↓	800 CT	3.2	.16	0	15.8:1	4.0	500	17	2	-
-029	JB608	DO-T33	71	.38	↓	↓	↓	1.06 KCT	3.2	.184	0	18.2:1	3.5	500	13	2	52
-030	JB609	DO-T34	109	.38	↓	↓	↓	1.6K CT	3.2	.28	0	22.4:1	3.0	500	13	2	64
-031	JB610	DO-T35	505	.38	↓	↓	↓	8K CT	3.2	1.04	0	50:1	1.0	100	13	2	64
-032	JB611	DO-T36	975	1175	BLU, BRN, RED (CT)	YEL, GRN, BLK (CT)	BRN, YEL	10K CT	10K CT	2.0	0	1:1	1.0	100	13	4	70
-033	JB621	DO-T46	7900	85	YEL, GRN, BLK (CT)	BLU, BRN, RED (CT)	↓	100K CT	500 CT	12	0	14.1:1	0	25	16	5(REVERSED)	100
-034	JB622	DO-T47	850	1080	BLU, BRN, RED (CT)	YEL, GRN, BLK (CT)	↓	9K CT	9K CT	1.6	0	1:1	1.0	100	13	5	64
-035	JB623	DO-T48	640	110	↓	↓	↓	8K CT	1.2K CT	1.5	0	2.58:1	1.0	100	13	5	64
-036	JB625	DO-T52	316	590	↓	↓	↓	4K CT	8K CT	.52	0	1:1.41	2.0	100	13	5	46

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + − 3 PLACE DECIMALS + − ANGLES + −	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN Bender DATE 3-DEC-65 CHECKED Tholye 8-DEC-65 APPROVAL Bruce L Hicks 5/4/66 CONTRACT NAS9-497	TRANSFORMER, AUDIO FREQUENCY SPECIFICATION CONTROL DRAWING
MATERIAL	NASA APPROVAL R C [illegible] 5/14/66	SIZE C CODE IDENT NO. 99974 1897388
APPROVAL	MIT APPROVAL [illegible] 5-9-66	SCALE SHEET 4 Of 5

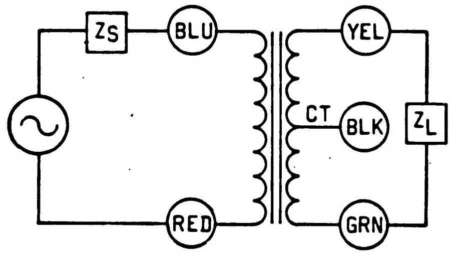
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28598	2 MAY 66	JHP EF



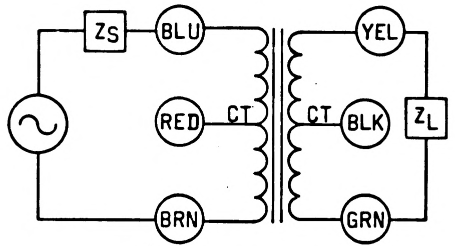
TEST CIRCUIT 1



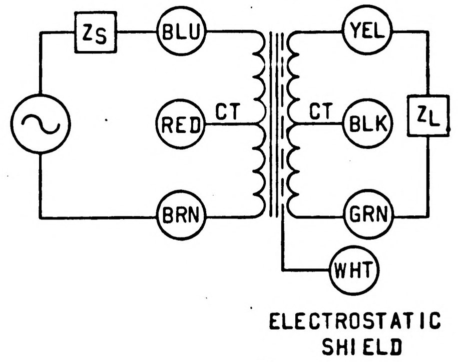
TEST CIRCUIT 2



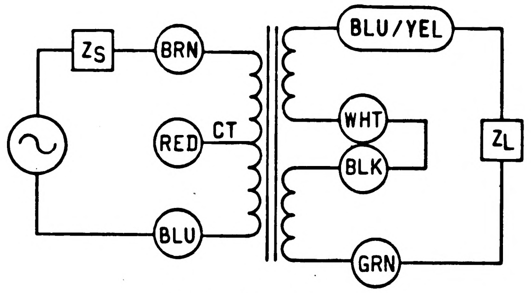
TEST CIRCUIT 3



TEST CIRCUIT 4



TEST CIRCUIT 5



TEST CIRCUIT 6

TABLE II (SPLIT SECONDARIES)

NASA DASH NUMBER	UTC PART NUMBER REF	UTC CATALOG REF	SEE NOTE 1 DC RESISTANCE OHMS ± 25% AT 25°C		LEAD COLOR CODING			LEAD POLARITY	SEE NOTE 2 FREQUENCY RESPONSE SOURCE & LOAD IMPEDANCE Ω		PRIMARY OPEN-CIRUCIT INDUCTANCE, MIN.		SEE NOTE 3 NO LOAD VOLTAGE RATIO ±3% PRIMARY:SECONDARY	UNBALANCED DC, MA MAX PRIMARY	RATED POWER LEVEL MILLI-WATTS	MIL-T-27 FAMILY	REF SCHEMATIC DIAGRAM & TEST CIRCUIT NUMBER	INDUCED VOLTAGE VOLTS
			PRI.	SEC.	PRI.	SEC.1	SEC.2		Z_S	Z_L	HENRIES	DC MA						
-037	JB612	DO-T37	195	455	PUR, BRN, RED (CT)	BLU/YEL WHT	BLK, GRN	BRN, BLU/YEL, BLK	2000	8000	.28	0	1:2	3.0	100	13	6	32
-038	JB613	DO-T38	560	230					10K	2000	1.6	0	2.24:1	1.0	100	13	6	70
-039	JB614	DO-T39	800	113					20K	1000	2.4	0	4.47:1	.5	50	13	6	78
-040	JB615	DO-T40	1700	60					40K	400	5.8	0	10:1	.25	50	13	6	100
-041	JB616	DO-T41	46	74					400	400	.09	0	1:1	8.0	500	17	6	-
-042	JB617	DO-T42	46	26					400	120	.09	0	1.82:1	8.0	500	17	6	-
-043	JB618	DO-T43	46	8					400	40	.09	0	3.16:1	8.0	500	17	6	-
-044	JB619	DO-T44	9.8	6					80	32	.015	0	1.58:1	12.0	500	17	6	-
-045	JB620	DO-T45	120	940					1000	16K	.17	0	1:4	3.5	100	12	6	23
-046	JB624	DO-T51	195	125					2000	2000	.28	0	1:1	3.0	100	13	6	-

NOTES:
1. SECONDARY RESISTANCE GIVEN IS FOR SECONDARIES IN SERIES.
2. LOAD IMPEDANCE (Z_L) GIVEN IS FOR SECONDARIES IN SERIES.
3. VOLTAGE RATIO GIVEN IS FOR SECONDARIES IN SERIES.

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + − 3 PLACE DECIMALS + − ANGLES + −	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN Bender DATE 3-DEC-65 CHECKED Molye 8-DEC 65 APPROVAL Bruce L Hicks 5/4/66 CONTRACT NAS9-497	TRANSFORMER, AUDIO FREQUENCY SPECIFICATION CONTROL DRAWING
MATERIAL	NASA APPROVAL 5/4/66	SIZE C · CODE IDENT NO. 99974 · 1897388
APPROVAL	MIT APPROVAL 5-9-66	SCALE · SHEET 5 of 5

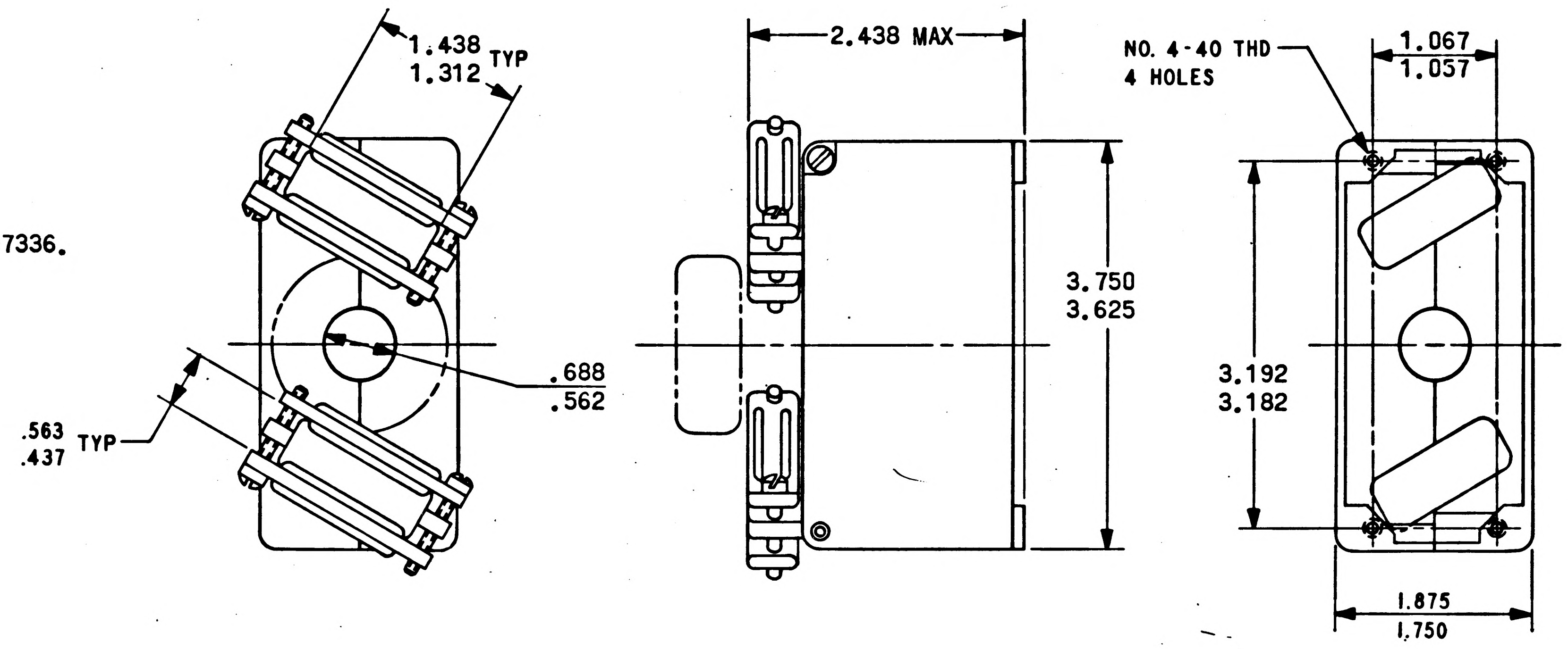
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 25564	29DEC 65	JJK

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING:
       - (a) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
       - (b) PACKAGE SHALL BE MARKED PER MIL-STD-129
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. MATERIAL:
     - (1) SCREWS: STAINLESS STEEL
     - (2) CLAMP: ALUMINUM ALLOY
     - (3) SHELL HALF: ALUMINUM ALLOY
   - B. FINISH:
     - (1) SCREWS: PASSIVATED
     - (2) CLAMP: BLACK ANODIZE
     - (3) SHELL HALF: BLACK ANODIZE
   - C. TO BE USED ON CONNECTORS 1897335 OR 1897336.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± —
3 PLACE DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
SEE REQUIREMENTS
CONTRACT NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN Bender DATE 2-DEC-65
CHECKED Wolfe 6 DEC 65
APPROVAL J.V. WEAN DEC 6 '65
APPROVAL 1/21/66
NASA APPROVAL A. C. METZGER
MIT APPROVAL 1-25-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CLAMP, CABLE, ELECTRICAL CONNECTOR—
DUAL ENTRY SPLIT BACKSHELL

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 99974
1897391
SCALE NONE
SHEET 1 of 1

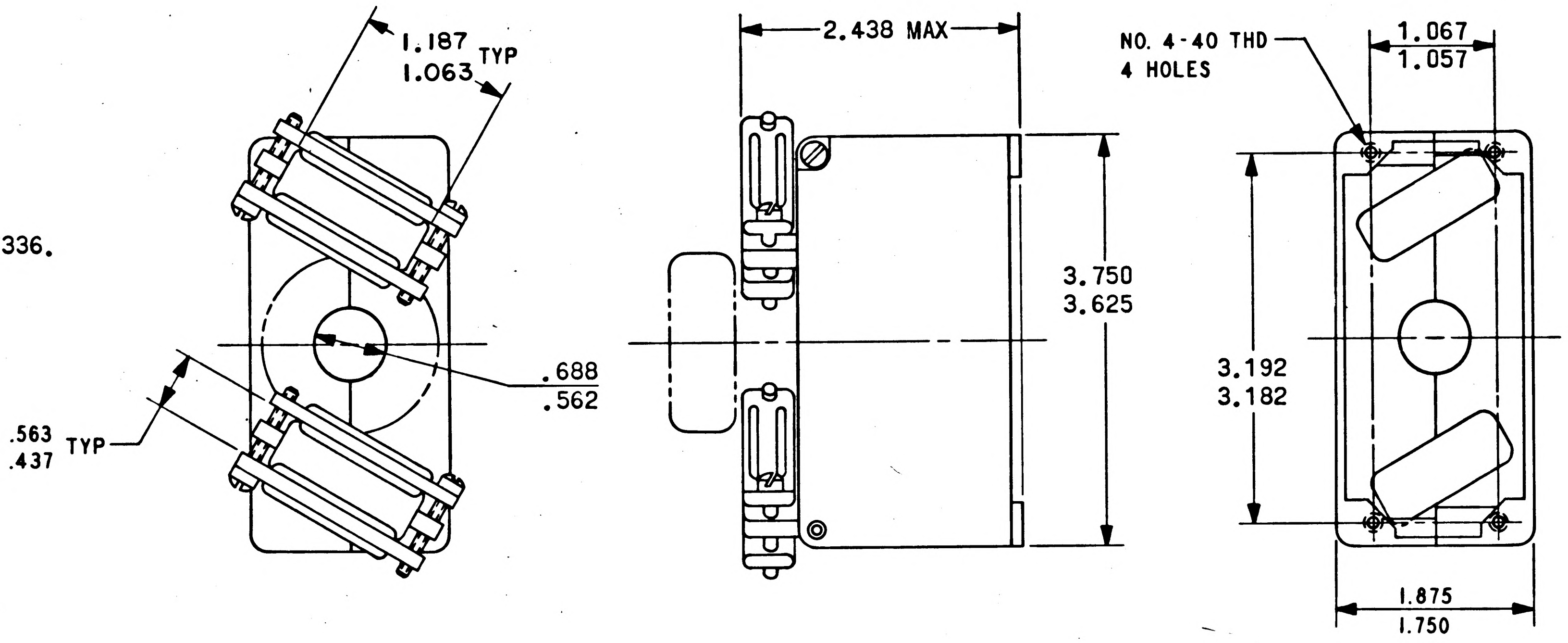
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 25564	29 DEC 65	JJK
	B	REVISED PER TDRR 27224	23 MAR 66	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) MARKING:
       - (a) PIECEMARKING: PART SHALL BE MARKED PER ND 1002019 WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
       - (b) PACKAGE SHALL BE MARKED PER MIL-STD-129
       - (c) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. MATERIAL:
     - (1) SCREWS: STAINLESS STEEL
     - (2) CLAMP: ALUMINUM ALLOY
     - (3) SHELL HALF: ALUMINUM ALLOY
   - B. FINISH:
     - (1) SCREWS: PASSIVATED
     - (2) CLAMP: BLACK ANODIZE
     - (3) SHELL HALF: BLACK ANODIZE
   - C. TO BE USED ON CONNECTORS 1897335 OR 1897336.



PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± ___
3 PLACE DECIMALS ± ___
ANGLES ± ___

DO NOT SCALE THIS DRAWING

MATERIAL
SEE REQUIREMENTS

CONTRACT NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

DRAWN Bender DATE 2-DEC-65
CHECKED WolyE 6 DEC 65
APPROVAL J.V. WEAN DEC 6 '65
APPROVAL J. Idman 1/21/66
NASA APPROVAL A. C. METZGER
MIT APPROVAL M.G. Nadler 1-25-6

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CLAMP, CABLE, ELECTRICAL CONNECTOR—
DUAL ENTRY SPLIT BACKSHELL

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 99974
1897391
SCALE NONE
SHEET 1 of 1

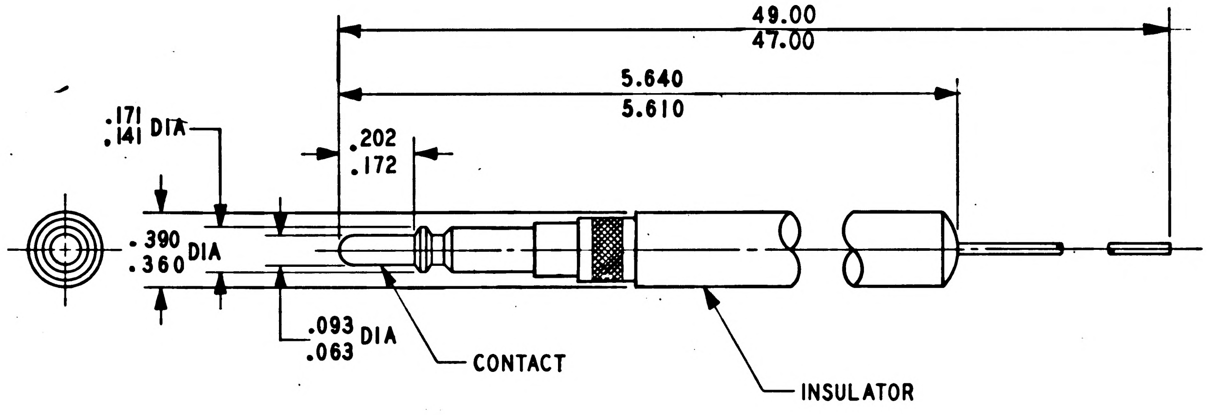
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED PER MXC 209357	3 MAR 66	J.H.P. J.E.G.
	B	INITIAL RELEASE CLASS A PER TDRR 28577	2-MAY 66	B. EF

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. DESIGN:
   - A. MATERIAL:
     - (1) WIRE: 18 AWG PER MIL-W-13169.
     - (2) CONTACT: BRASS PER QQ-B-626, COMPOSITION 22.
     - (3) INSULATOR: BUTYRATE
   - B. FINISH:
     - (1) CONTACT: .000060 MIN GOLD PER MIL-G-45204 TYPE II, CLASS I, OVER .0001 NICKEL PER QQ-N-290.

NASA DASH NUMBER	COLOR	MANUFACTURER'S PART NUMBER (REFERENCE)
-001	RED	397029-3
-002	BLACK	397029-2



THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± ___ 3 PLACE DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN Bender DATE 11-JAN-66
CHECKED Ed Foster 12 JAN 66
APPROVAL J. M. Watson 5-3-66
CONTRACT NAS9-497
NASA APPROVAL
MIT APPROVAL 5-9-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

LEAD, TEST—PATCHBOARD

SPECIFICATION CONTROL DRAWING

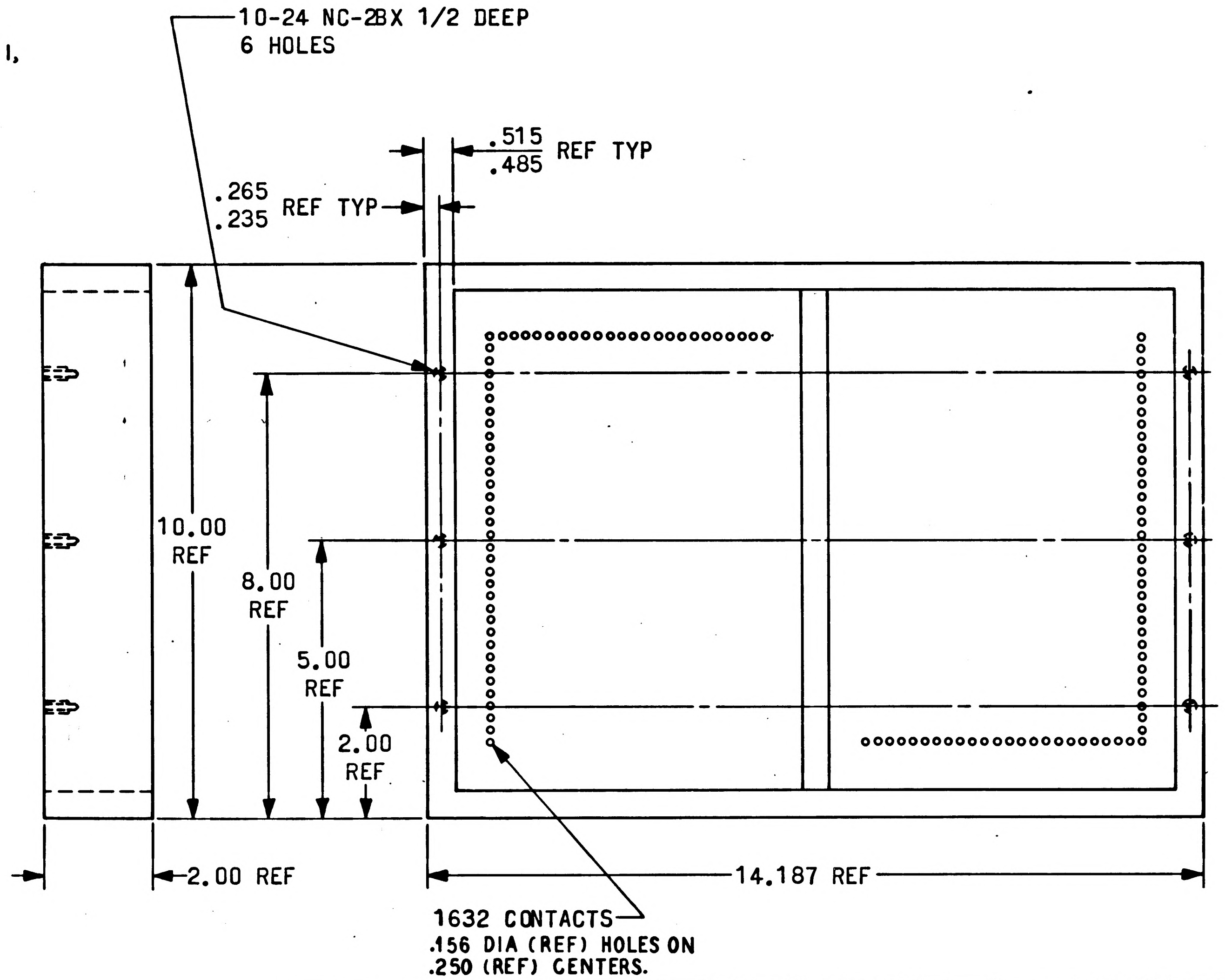
SIZE C CODE IDENT NO. 99974 1897403
SCALE NONE SHEET 1 of 1

MIL-1082C D

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED PER MXC 209358	4 MAR 66	DKD
	B	REVISED PER MXC 210592	31 MAR 66	R.W.F.
	C	INITIAL RELEASE CLASS A PER TDRR 28599	2 MAY 66	PG

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. DESIGN:
   - A. MATERIAL:
     - (1) INSULATION: DIALLYLPHTHALATE PER MIL-M-14F, TYPE MDG.
     - (2) CONTACTS: BRASS PER QQ-B-613.
     - (3) FRAME: ALUMINUM ALLOY.
   - B. FINISH:
     - (1) CONTACT AREA: .000050 MIN. GOLD PER MIL-G-45204, TYPE II, CLASS I, OVER .0001 MIN NICKEL PER QQ-N-290.
     - (2) FRAME: BLACK ANODIZED PER MIL-A-8625, TYPE II.
   - C. ELECTRICAL:
     - (1) CURRENT RATING: 5 AMP PER CONTACT.
     - (2) OPERATING VOLTAGE: 1500 VDC MAX.
3. APPLICATION DATA



NASA DASH NUMBER	MANUFACTURER'S PART NUMBER (REFERENCE)
-001	695142-4

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± ___
3 PLACE DECIMALS ± ___
ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN Bender DATE 11-JAN-66
CHECKED J. A. Cymoure 12 JAN 66
APPROVAL J. M. Watson 5-3-66
CONTRACT NAS9-497
NASA APPROVAL
MIT APPROVAL M6 Wheeley 5 4 66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PATCHBOARD—1632 CONTACTS

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 99974
1897404
SCALE NONE
SHEET 1 of 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28345	6 APRIL 66	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) FIGURE I: DIALLYL PHTHALATE, GLASS FILLED.
     - (2) FIGURE II: POLYCARBONATE PLASTIC.
     - (3) FIGURE III: POLYCARBONATE PLASTIC.
     - (4) FIGURE IV: EPOXY BASE, HARD PLASTIC.
     - (5) FIGURE V: POLYCARBONATE PLASTIC.
     - (6) FIGURE VI: DIALLYL PHTHALATE, GLASS FILLED.
   - B. MARKING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
     - SUPPLIER'S NAME
     - NASA PART NUMBER
     - DATE CODE OR DATE OF MANUFACTURE
     - MANUFACTURER'S PART NUMBER (OPTIONAL)
3. DESIGN:
   - A. FOR USE IN PLACE OF PIN OR SOCKET CONTACTS IN APPROPRIATE ELECTRICAL CONNECTORS TO PROVIDE RESISTANCE TO DUST AND MOISTURE.

DASH NUMBER	FIG. NO.	COLOR	FOR USE IN PLACE OF (CONTACT SIZE)	DIMENSION A		FOR USE WITH CONNECTOR TYPE (REF)	MANUFACTURER'S PART NUMBER (REF)
				MAX	MIN		
-001	I	GREEN	NO. 22	.078	.048	DSM, STK	2213-9-0100
-002	II	RED	NO. 20	.093	.063	DTK	26518-P20
-003	III	BLUE	NO. 16	.065	.055	DTK	0102-019-001
-004	IV	YELLOW	NO. 12	.131	.111	DTK	0613-1-1201
-005	V	GREEN	NO. 8	.270	.260	DTK, DS	0102-019-000
-006	VI	RED	NO. 20	.124	.094	DS	CP140-1
-007	VI	BLUE	NO. 16	.156	.126	DS	CP140-2
-008	VI	YELLOW	NO. 12	.218	.188	DS	CP140-3

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. MAY BE INCLUDED IN APPROPRIATE CONNECTOR PACKAGE AS LOOSE PIECES OR ORDERED SEPARATELY IN BULK QUANTITIES.

MASTER

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

BLOCK II/LEM

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + — − 3 PLACE DECIMALS + — − ANGLES + — −	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	DRAWN Bender DATE 2-FEB-66 CHECKED M. Manning 3 FEB 66 APPROVAL 9-26-66	PLUG, END SEAL, ELECTRICAL CONNECTOR
DO NOT SCALE THIS DRAWING	CONTRACT NAS9-497	SPECIFICATION CONTROL DRAWING
MATERIAL SEE REQUIREMENTS	NASA APPROVAL A. C. METZGER	SIZE C · CODE IDENT NO. 99974 · 1897411
APPROVAL	MIT APPROVAL	SCALE NONE · SHEET 1 OF 2

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28345	6 APRIL 66	

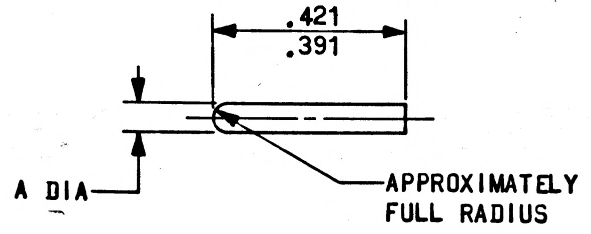

.421
.391
A DIA
APPROXIMATELY FULL RADIUS

FIGURE I

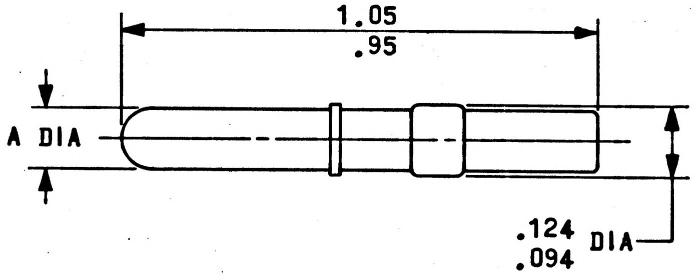

1.05
.95
A DIA
.124
.094
DIA

FIGURE II

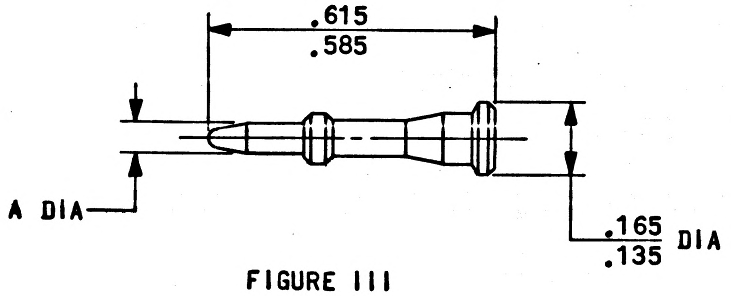

.615
.585
A DIA
.165
.135
DIA

FIGURE III

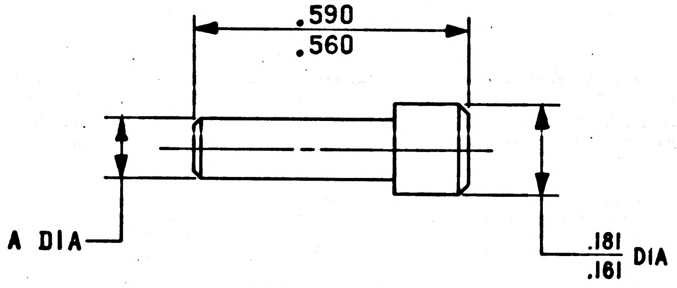

.590
.560
A DIA
.181
.161
DIA

FIGURE IV

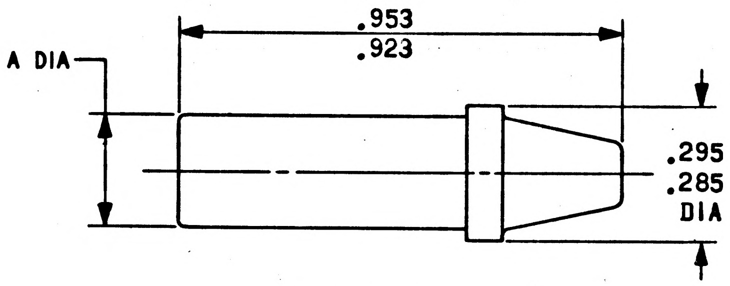

A DIA
.953
.923
.295
.285
DIA

FIGURE V

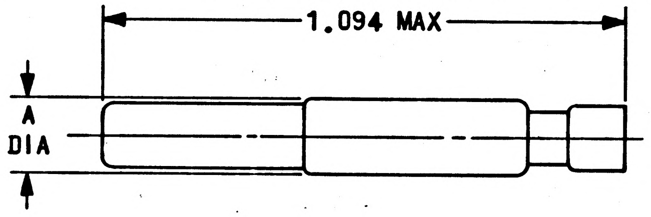

1.094 MAX
A
DIA

FIGURE VI

MASTER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + 3 PLACE DECIMALS + ANGLES + – – –	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	DRAWN Bender DATE 2-FEB-66 CHECKED 3 FEB 66 APPROVAL 4-26-66	PLUG, END SEAL, ELECTRICAL CONNECTOR
DO NOT SCALE THIS DRAWING	CONTRACT NAS9-497	SPECIFICATION CONTROL DRAWING
MATERIAL	NASA APPROVAL A. C. METZGER	SIZE C · CODE IDENT NO. 99974 · 1897411
APPROVAL	MIT APPROVAL 26 April 66	SCALE · SHEET 2 OF 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28345	6 APRIL 66	
	B	REVISED PER TDRR 34446	30 AUG 67	JWL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) FIGURE I: DIALLYL PHTHALATE, GLASS FILLED.
     - (2) FIGURE II: POLYCARBONATE PLASTIC.
     - (3) FIGURE III: POLYCARBONATE PLASTIC.
     - (4) FIGURE IV: EPOXY BASE, HARD PLASTIC.
     - (5) FIGURE V: EPOXY BASE, HARD PLASTIC.
     - (6) FIGURE VI: DIALLYL PHTHALATE, GLASS FILLED.
     - (7) FIGURE VII: DIALLYL PHTHALATE, GLASS FILLED.
   - B. MARKING: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
     - SUPPLIER'S NAME
     - NASA PART NUMBER
     - DATE CODE OR DATE OF MANUFACTURE
     - MANUFACTURER'S PART NUMBER (OPTIONAL)

3. DESIGN:
   - A. FOR USE IN PLACE OF PIN OR SOCKET CONTACTS IN APPROPRIATE ELECTRICAL CONNECTORS TO PROVIDE RESISTANCE TO DUST AND MOISTURE.

DASH NUMBER	FIG. NO.	COLOR	FOR USE IN PLACE OF (CONTACT SIZE)	DIMENSION A		FOR USE WITH CONNECTOR TYPE (REF)	MANUFACTURER'S PART NUMBER (REF)
				MAX	MIN		
-001	I	YEL OR GRN	NO. 22	.078	.048	DSM, STK	2213-9-0100
-002	II	RED	NO. 20	.093	.063	DTK	26518-P20
-003	III	BLUE	NO. 16	.065	.055	DTK	0102-019-001
-004	IV	YELLOW	NO. 12	.131	.111	DTK	0613-1-1201
-005	V	GREEN	NO. 8	.270	.260	DTK,	0102-021-000
-006	VI	RED	NO. 20	.124	.094	DS	CP140-1
-007	VI	BLUE	NO. 16	.156	.126	DS	CP140-2
-008	VI	YELLOW	NO. 12	.218	.188	DS	CP140-3
-009	VII	GREEN	NO. 8	.235	.205	DS	CP140-4

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

NOTES:

1. MAY BE INCLUDED IN APPROPRIATE CONNECTOR PACKAGE AS LOOSE PIECES OR ORDERED SEPARATELY IN BULK QUANTITIES.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

BLOCK II/LEM

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS ± — 3 PLACE DECIMALS ± — ANGLES ± —	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	DRAWN Bender DATE 2-FEB-66 CHECKED M. Manning 3 FEB 66 APPROVAL 4-26-66	PLUG, END SEAL, ELECTRICAL CONNECTOR
DO NOT SCALE THIS DRAWING	CONTRACT NAS9-497	SPECIFICATION CONTROL DRAWING
MATERIAL SEE REQUIREMENTS	NASA APPROVAL A. C. METZGER	SIZE C CODE IDENT NO. 99974 1897411
APPROVAL	MIT APPROVAL	SCALE NONE SHEET 1 OF 2

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 28345	6 APRIL 66	
	B	REVISED PER TDRR 34446	30 AUG 67	JWL

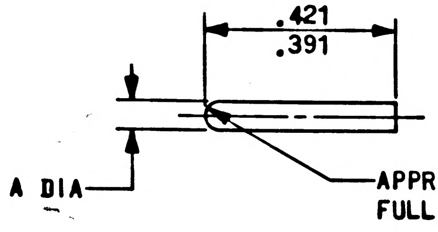

.421
.391
A DIA
APPROXIMATELY
FULL RADIUS

FIGURE I

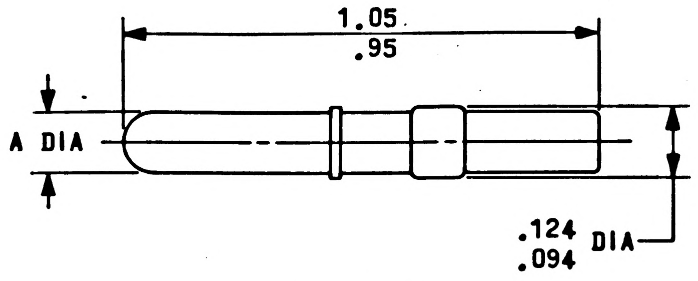

1.05
.95
A DIA
.124
.094
DIA

FIGURE II

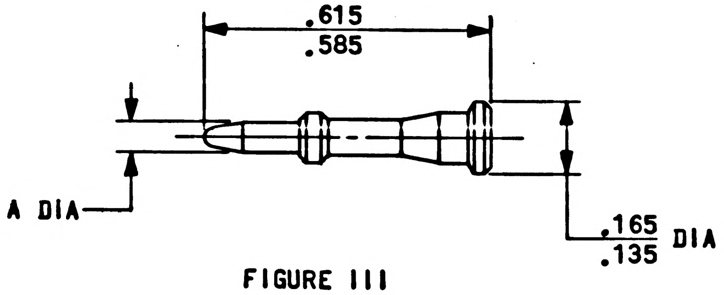

.615
.585
A DIA
.165
.135
DIA

FIGURE III

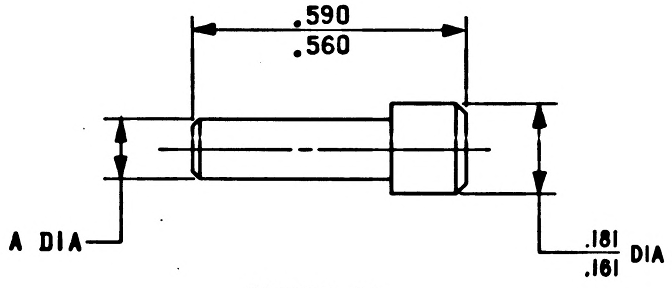

.590
.560
A DIA
.181
.161
DIA

FIGURE IV

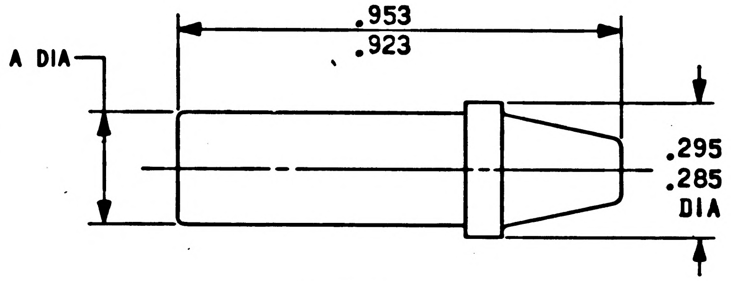

.953
.923
A DIA
.295
.285
DIA

FIGURE V

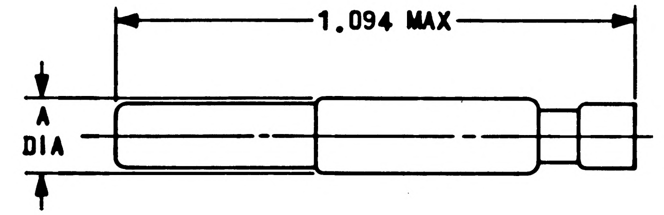

1.094 MAX
A
DIA

FIGURE VI

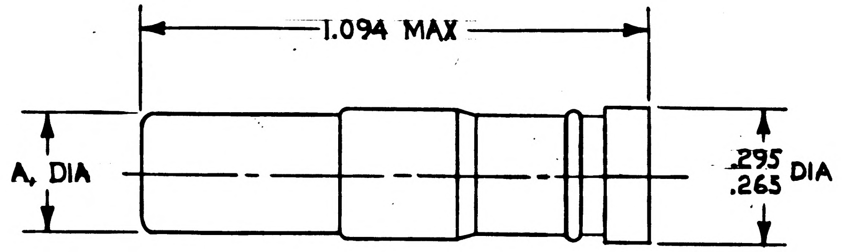

1.094 MAX
A DIA
.295
.265
DIA

FIGURE VII

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS + −
3 PLACE DECIMALS + −
ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN Bender DATE 2-FEB-66
CHECKED 3 Feb 66
APPROVAL 4-26-66
CONTRACT NAS9-497
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PLUG, END SEAL, ELECTRICAL CONNECTOR

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 99974
1897411
SCALE
SHEET 2 OF 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 30105	6 MAY 66	DKD EY

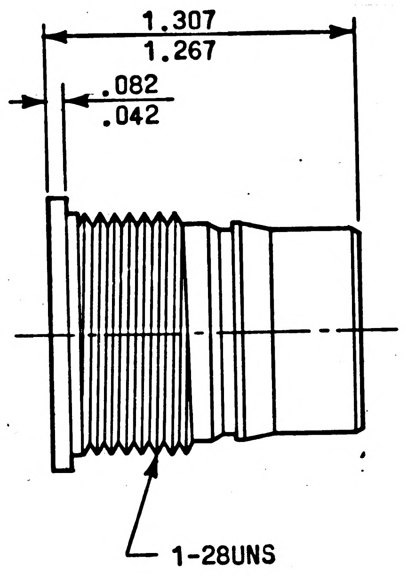
REQUIREMENTS:

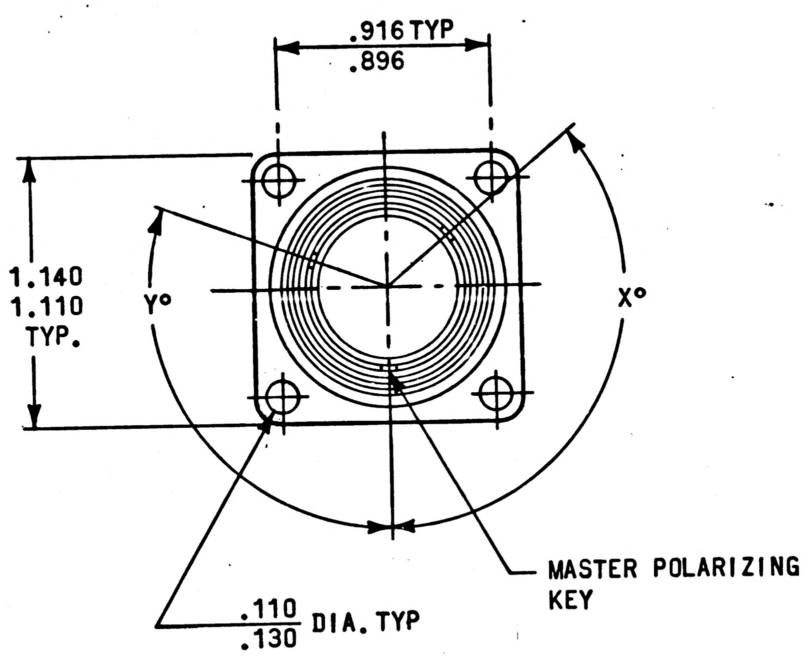
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PIECEMARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL AND NASA PART NUMBER. MANUFACTURER'S PART NUMBER MAY APPEAR ON THE UNIT.
     - (2) PACKAGE: INTERNAL INDIVIDUAL OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - SUPPLIER'S NAME
       - NASA PART NUMBER
       - MANUFACTURER'S PART NUMBER

3. DESIGN:
   - A. MATERIALS AND FINISH:
     - (1) HOUSING: ALUMINUM ALLOY PER QQ-S-225/5, TEMPER T4, OR EQUIVALENT. HARD ANODIZE FINISH PER AMS 2468, DYED BLACK OR EQUIVALENT.
   - B. FOR USE AS DUMMY STORAGE RECEPTACLE FOR 1897366, 1897180 OR EQUIVALENT.

DASH NUMBER	SHELL SIZE	POLARIZATION POSITIONS (REF)		MANUFACTURER'S PART NUMBER (REF)
		X°	Y°	
-001	15	130	110	MD53-02-15-N
-002		130	90	MD53-02-15-I





THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIER LIST FOR THIS DRAWING.

MASTER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS + − 3 PLACE DECIMALS + − ANGLES + −	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN Gruenewald DATE 20 APR 66 CHECKED J Sayler 21 APR 66 APPROVAL J. M. Watson 6-13-66 CONTRACT NAS9-497	DUMMY CONNECTOR, RECEPTACLE— FOR STORAGE SPECIFICATION CONTROL DRAWING
MATERIAL SEE REQUIREMENTS	NASA APPROVAL A. C. METZGER	SIZE C CODE IDENT NO. 99974 1897424
APPROVAL	MIT APPROVAL M6 Murly 7-5-66	SCALE NONE SHEET 1 of 1

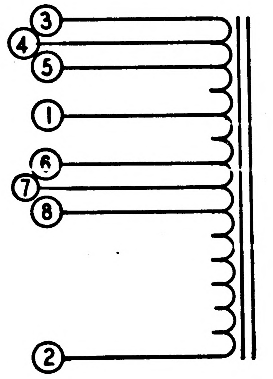
ZONE	LTR.	DESCRIPTION	DATE	APPROVED
	A	REVISION STATUS CHANGED	4 MAY 66	LK
	B	INITIAL RELEASE CLASS A PER TDRR 30/05	4 MAY 66	

REQUIREMENTS:

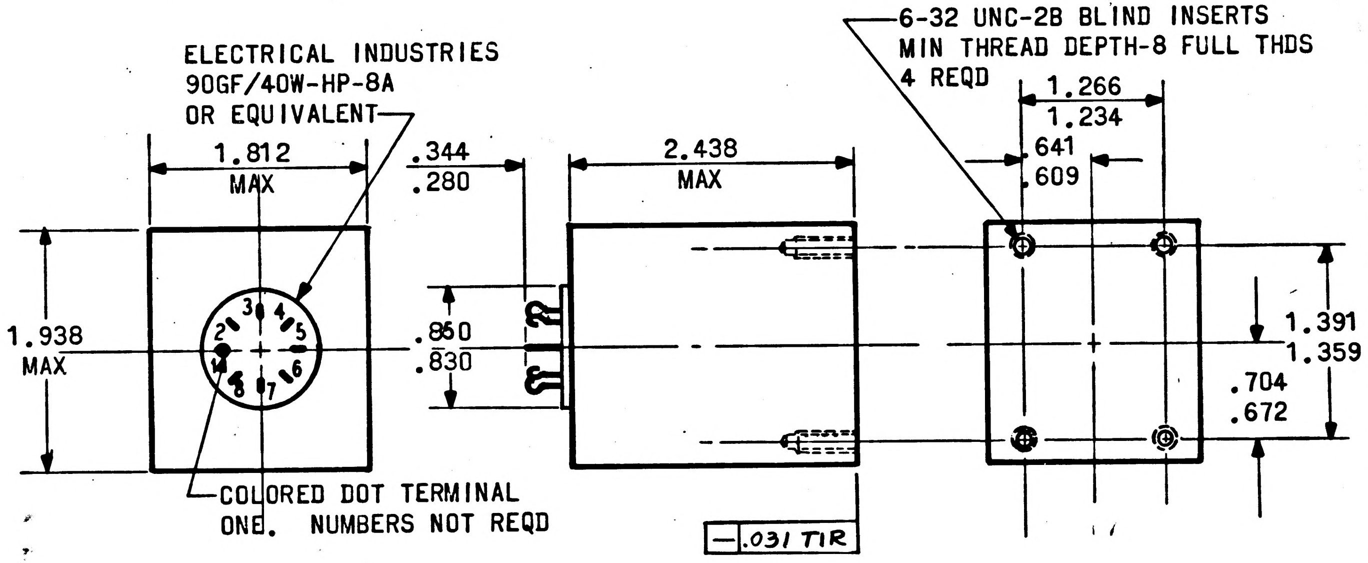
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. DESIGN TO BE IN CONFORMANCE WITH SPECIFICATION MIL-T-27.
   - D. BUSH TRANSFORMER PART NUMBER CG-500. (FOR REF)
   - E. ADC PRODUCTS PART NUMBER A16516 (FOR REF).

2. INSPECTION AND ACCEPTANCE:
   - A. UNIT SHALL MEET ALL REQUIREMENTS OF TABLE I.
   - B. COLOR: UNIT SHALL BE FINISHED WITH COLOR 514 OF ANA BULLETIN 157 (INSTRUMENT BLACK).
   - C. MARKING: MARK PERMANENTLY AND LEGIBLY WITH THE NASA DRAWING NUMBER PLUS ALL MARKING REQUIREMENTS OF MIL-T-27. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON PART AND PACKAGE.

3. DESIGN:
   - A. THE UNIT SHALL MEET ALL REQUIREMENTS OF MIL-T-27 FOR GRADE 4, CLASS R, LIFE EXPECTANCY X, FAMILY 01 IN AN AMBIENT TEMPERATURE OF 65°C EXCEPT PARAGRAPH 3.2 AND LIFE TEST UNDER GROUP C INSPECTION TESTS WHICH SHALL BE WAIVED.
   - B. ALTITUDE: 10,000 FEET OPERATING, 50,000 FEET NON-OPERATING.
   - C. AMBIENT OPERATING TEMPERATURE RANGE: 0°C TO +65°C.
   - D. SOLDER USE FOR ELECTRICAL CONNECTIONS SHALL BE COMPOSITION SN 60 PER QQ-S-571.
   - E. MAXIMUM WORKING VOLTAGE: 175 VOLTS INSTANTANEOUS.
   - F. REGULATION: 5% MAXIMUM.
   - G. TERMINALS 3, 4 AND 5 ARE USED WITH 16 OHM LOADS. TERMINALS 6, 7 AND 8 ARE USED WITH 9 OHM LOADS. ONE END OF LOAD IS ALWAYS CONNECTED TO TERMINAL 2.



SCHEMATIC DIAGRAM
VOLTAGES AND CURRENTS ARE RMS VALUES UNLESS OTHERWISE NOTED.


ELECTRICAL INDUSTRIES
90GF/40W-HP-8A
OR EQUIVALENT
1.812
MAX
.344
.280
2.438
MAX
1.938
MAX
.850
.830
1
2
3
4
5
6
7
8
COLORED DOT TERMINAL ONE. NUMBERS NOT REQD
—.031 TIR
6-32 UNC-2B BLIND INSERTS
MIN THREAD DEPTH-8 FULL THDS
4 REQD
1.266
1.234
.641
.609
1.391
1.359
.704
.672

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± —
3 PLACE DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN R.W. Turner DATE 25 APR 66
CHECKED C. WILSON 27 APR 66
APPROVAL J. M. Watson 6-23-66
CONTRACT NAS9-497
NASA APPROVAL C.G. METZGER
MIT APPROVAL Mi Marley 7-5-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, POWER,
FIXED AUTOTRANSFORMER -
28 VOLTS - MULTIPLE TAP, 60 CPS 67 VA
SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 99974
1897425
SCALE NONE
SHEET 1 OF 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED PER MXC212121	4 MAY 66	LK JJK
	B	INITIAL RELEASE CLASS A PER TDRR 30105	4 MAY 66	RP

TABLE 1
INSPECTION TESTS

TITLES IN PARAGRAPH COLUMN REFER TO PARAGRAPH TITLES IN SPECIFICATION MIL-T-27.

PARAGRAPH	
SEALING	IMMERSE IN LIQUID AS INDICATED.
DIELECTRIC STRENGTH	APPLY 500 VOLTS (RMS) BETWEEN WINDING AND CASE.
INDUCED VOLTAGE	APPLY 56 VOLTS, 120 CPS TO TERMINALS (1-2), SECONDARY OPEN.
INSULATION RESISTANCE	10,000 MEGOHMS MINIMUM AT 25°C.
RATED LOAD	WITH 28 VOLTS, 60 CPS APPLIED (1-2), THE LOADED TAP VOLTAGES SHALL BE: (2-3) = 32.5 ± 0.2 VOLTS (2-4) = 31.5 ± 0.2 VOLTS } WITH A 16 OHM LOAD (2-5) = 30.5 ± 0.2 VOLTS (2-6) = 24.5 ± 0.2 VOLTS (2-7) = 23.5 ± 0.2 VOLTS } WITH A 9 OHM LOAD (2-8) = 22.5 ± 0.2 VOLTS LOADS ARE NOT SIMULTANEOUS
TEMPERATURE RISE	SHALL NOT EXCEED 40°C AT EITHER LOAD CONDITION DESCRIBED IN RATED LOAD.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS ± — 3 PLACE DECIMALS ± — ANGLES ± —	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN R.W. Turner DATE 25 APR 66 CHECKED C. WILSON 27 APR 66 APPROVAL 6-13-66 CONTRACT NAS 9-497	TRANSFORMER, POWER, FIXED AUTOTRANSFORMER - 28 VOLTS - MULTIPLE TAP, 60 CPS 67 VA SPECIFICATION CONTROL DRAWING
MATERIAL	C. METZGER NASA APPROVAL	SIZE C CODE IDENT NO. 99974 1897425
APPROVAL	MIT APPROVAL 7-5	SCALE — SHEET 2 OF 2

MIL-1062C D

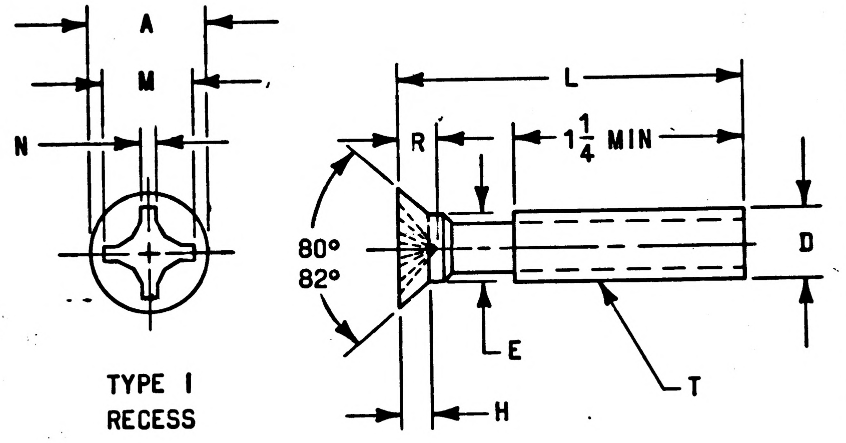
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 30105	26 MAY 66	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. UNLESS OTHERWISE SPECIFIED SCREWS SHALL MEET THE REQUIREMENTS OF ASA B18.6.3-1962.

2. INSPECTION AND ACCEPTANCE:
   - A. MARKING:
     - (1) PACKAGE: INTERNAL, INDIVIDUAL, OR COLLECTIVE PACKAGES AND EXTERNAL PACKAGING SHALL BE MARKED WITH THE FOLLOWING INFORMATION:
       - (a) SUPPLIER'S NAME
       - (b) NASA PART NUMBER
     - (2) MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.

3. DESIGN:
   - A. MATERIAL: CRES PER FF-S-86.
   - B. FINISH: PASSIVATE PER MIL-F-14072, E300.



TYPE I RECESS

TABLE 1

NASA DASH NUMBER	T	A			D	L	H	M		R		N	E	
	THREAD SIZE	HEAD DIAMETER			DIA OF SCREW BASIC	LENGTH	HEAD HEIGHT (REF)	DIAMETER OF RECESS		DEPTH OF RECESS		WIDTH OF RECESS	SHOULDER DIAMETER	
		MAX SHARP	MIN SHARP	ABS MIN				MAX	MIN	MAX	MIN	MIN	MAX	MIN
-001	4-40 NC-3A	.199	.181	.171	.1120	2	.052	.107	.094	.068	.052	.018	.112	.106

TABLE 2

NOMINAL SCREW LENGTH	TOLERANCE ON LENGTH
UP TO 1" INCL.	-1/32"
OVER 1" TO 2" INCL.	-1/16"
OVER 2"	-3/32"

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTOR'S ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Patterson DATE 9 MAY 66
CHECKED J. Dayles 10 MAY 66
APPROVAL J. M. Watson 6-13-66
CONTRACT NAS9-497
A. C. METZGER
NASA APPROVAL
MIT APPROVAL M. B. Morley 7-5-66

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE-FLAT TRIM HEAD, 82°
CROSS RECESS, TYPE 1

SPECIFICATION CONTROL DRAWING

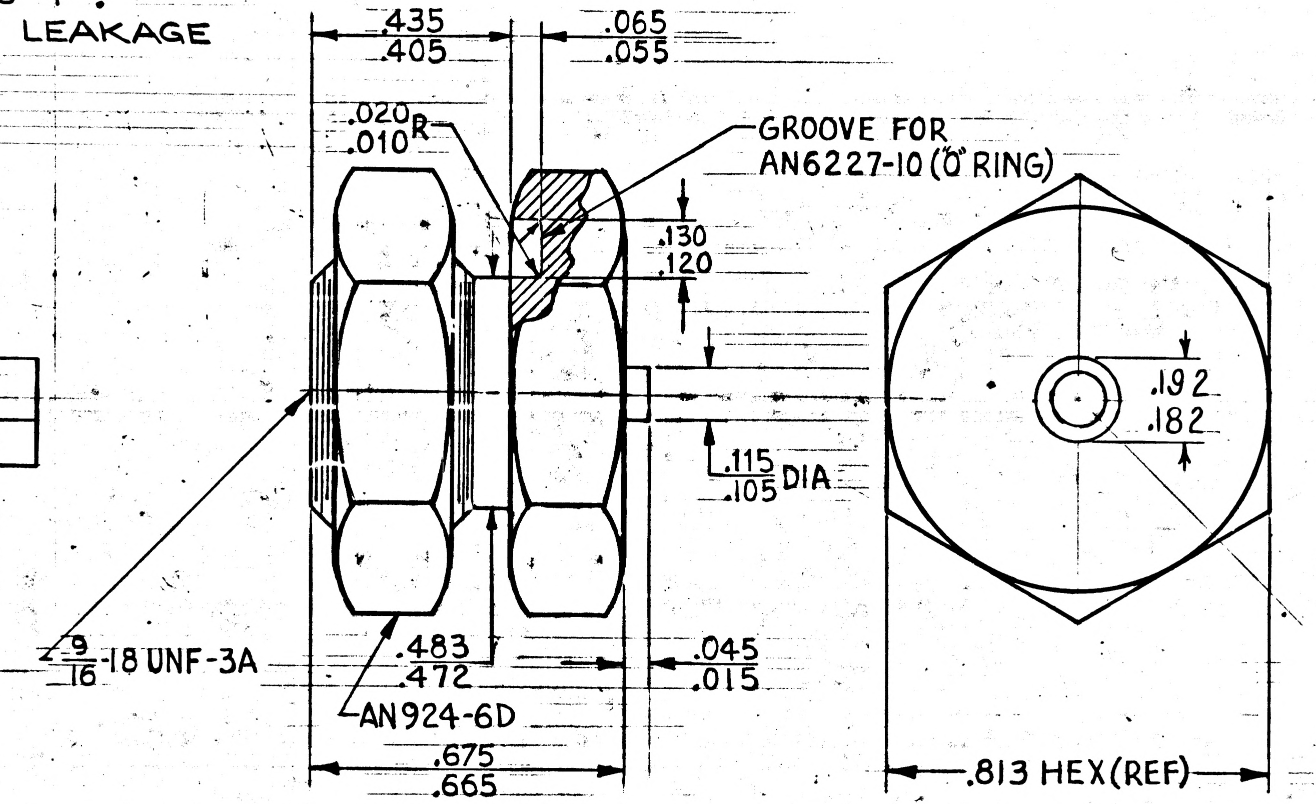
SIZE C
CODE IDENT NO. 99974
1897427
SCALE NONE
SHEET 1 of 1

ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD
	A	① REMOVED "MODIFIED" FROM MFR P/N ② REMOVED SLOT & NOTE "SLOT .03 WIDE X .03 DP(REF) ③ ADD DIM. .192/.182 ④ ADD CROSS SECTIONING	MXC 216035	5 NOV 66	LL DPW
	B	INITIAL RELEASE CLASS A PER TDRR 32805		26 JAN 67	

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN MIL-Q-9858.
   - C. MARKING:
     1. PART SHALL BE MARKED PER ND-1002019, WITH THE NASA PART NUMBER AND MANUFACTURER'S NAME AND/OR SYMBOL.
     2. PACKAGE SHALL BE MARKED PER MIL-STD-129 WITH THE MANUFACTURER'S NAME AND PART NUMBER.
     3. MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE.
2. DESIGN:
   - A. MATERIAL AND FINISH
     1. ALUMINUM 2024-T4 PER QQ-A-225/6 TEMPER T4, CHROMIC ANODIZE PER MIL-A-8625, TYPE 1.
     2. "O" RING BUNA "N", HARDNESS 40 ± 5 SHORE A DUROMETER.
   - B. OPERATING PRESSURE 0-15 PSI
   - C. OPERATING TEMPERATURE -65°F TO 165°F.
   - D. CRACKING PRESSURE 5 ± 1 PSI, ZERO LEAKAGE @ 0 TO 1.5 PSI.
   - E. NO INTERNAL OR EXTERNAL LEAKAGE.

DASH NUMBER	MANUFACTURER'S PART NUMBER (REF)
-001	P5-308-6



THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIER LIST.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± ___ 3 PLACE DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Parks DATE 30AUG66
CHECKED J. Stefma 30 AUG 66
GM APPROVAL McL V. WEAN 1-3-67 31 AUG 66
CONTRACT NAS 9-497
NASA APPROVAL A.C. H. McEnery 1/12/67
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VALVE, VACUUM RELIEF

SPECIFICATION CONTROL DRAWING

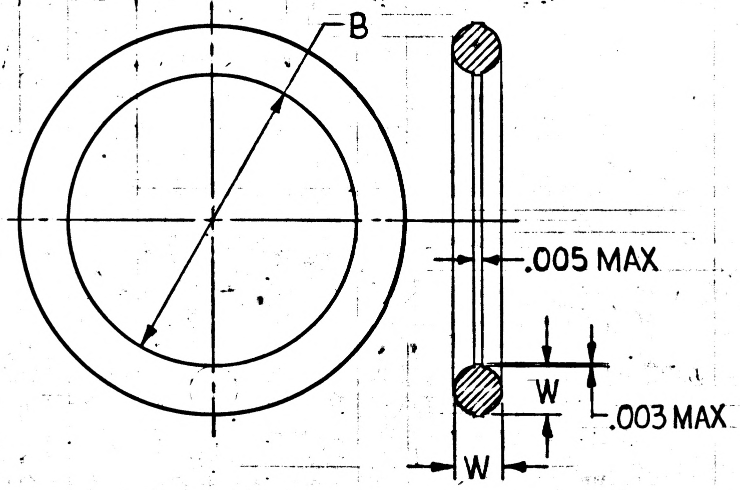
SIZE C CODE IDENT NO. 99974 1897429
SCALE SHEET

ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD
	A	ADDED DASH NUMBER 005 & 006 & ASSOC INFO	MXC 216036	5 NOV 66	LL DPB
	B	ADDED DASH NUMBER 007 & ASSOC INFO	MXC 216342	28 NOV 66	JRK
	C	INITIAL RELEASE CLASS A PER TDRR 32805		26 JAN 67	12 DEC 66

REQUIREMENTS:

1. GENERAL
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. PACKING AND SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-116, SUB METHOD IA-8.
2. INSPECTION & ACCEPTANCE
   - A. PACKAGE SHALL BE MARKED WITH DRAWING NUMBER, DASH NUMBER, AND MANUFACTURER'S IDENTIFICATION IN ACCORDANCE WITH ND1002019.
   - B. DIMENSIONS: AS INDICATED.
3. DESIGN REQUIREMENTS
   - A. MATERIAL: SILICONE RUBBER PER AMS 3303

DASH NUMBER	W (DIAMETER)	B (ID)	MANUFACTURER'S (REF) PART NUMBER	MANUFACTURER'S (REF) COMPOUND
-001	.103±.003	.487 ±.005	2-112	S-613-6
-002	.139±.004	3.859 ±.015	2-241	
-003		7.484 ±.030	2-264	
-004		7.984 ±.030	2-266	
-005	.139±.004	7.234 ±.030	2-263	S-613-6
-006	.139±.004	10.770 ±.030	5-467	S-613-6
-007	.139±.004	10.484 ±.030	2-275	S-613-6



ALL DIAMETERS OF CROSS SECTION SHALL EQUAL "W"

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIER LIST.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 3A
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN J. Parks DATE 30 AUG 66
CHECKED J. Stelma 30 AUG 66
APPROVAL J. V. WEAN
CONTRACT NAS 9-497
NASA APPROVAL A C
G Mc 1/12/67
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PACKING, PREFORMED "O" RING
SPECIFICATION CONTROL DRAWING

SIZE
CODE IDENT NO. 99974
1897430
SCALE
SHEET

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED PER MXC 216786	12 DEC 66	
	B	INITIAL RELEASE CLASS A PER TDRR 32805	26 JAN 67	12 DEC 66

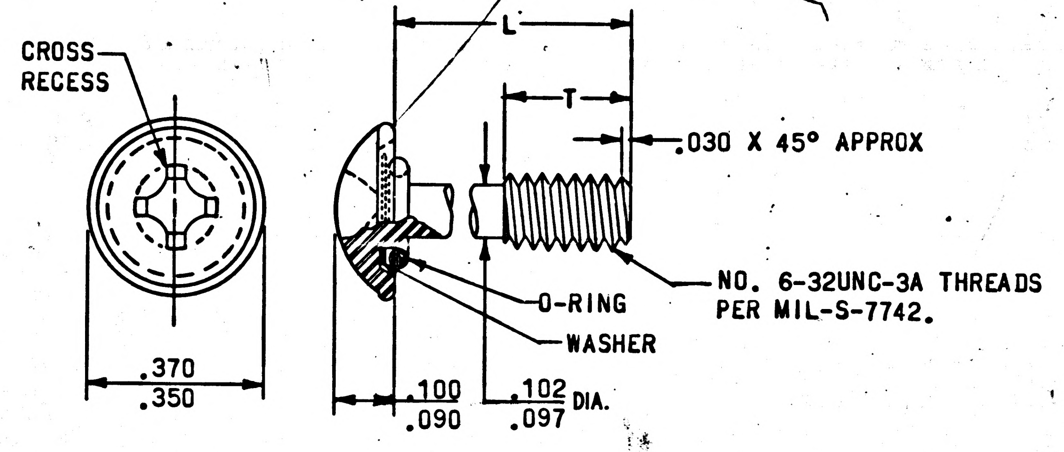
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING, AND CONTAINER MARKING PER ND 1002215, CLASS I, CODE 7.

2. INSPECTION AND ACCEPTANCE:
   - A. MATERIAL:
     - (1) SCREW: STAINLESS STEEL, PER QQ-S-703 CLASS 302, 303, 305 OR EQUIVALENT.
     - (2) O-RING: SILICONE RUBBER PER AMS3302.
     - (3) WASHER: POLYTETRAFLUOROETHYLENE (TEFLON) PER AMS3652.
   - B. FINISH:
     - (1) SCREW: PASSIVATE PER MIL-F-14072, FINISH E300.

DASH NUMBER	L LENGTH		T		APPLICATION DATA
	MAX	MIN	MAX	MIN	HOLE DIA (MAX)
-001	.440	.422	.228	.208	.149
-002	.500	.480	.228	.208	.149
-003	1.280	1.235	.228	.208	.149
-004	.375	.345	.197	.177	.149

THE PART NUMBER IS THE DRAWING NUMBER PLUS THE APPLICABLE DASH NUMBER.



APPROVED SOURCES:

PROCURE ONLY FROM SOURCES LISTED ON CONTRACTORS ACCEPTABLE SUPPLIERS LIST FOR THIS DRAWING.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ±
3 PLACE DECIMALS ±
ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE REQUIREMENTS
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DRAWN Wayne Knoll DATE 14 OCT 66
CHECKED Fesler 17OCT66
APPROVAL J. M. Watson 1-3-67
CONTRACT NAS 9-497
NASA APPROVAL
1/12/67
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, SEALING—BUTTON HEAD

SPECIFICATION CONTROL DRAWING

SIZE C
CODE IDENT NO. 99974
1897431
SCALE NONE
SHEET 1 of 1

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.

2. MATERIAL:
   QQ-S-763 CL321 STAINLESS STEEL FOR ITEMS ① AND ②.
   MIL-S-6721 CL321 STAINLESS STEEL FOR ITEMS ③④⑤⑥.

3. REQUIREMENTS:

   A. PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072 FINISH E-300.

   B. ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

   C. INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611 AS SHOWN OR ALTERNATE ASSY METHOD.

   D. WELDING TO BE INSPECTED PER MIL-I-6866.

   E. DIAMETERS "C" THRU "H", "J" THRU "N", "P" THRU "V" AND 2 PLACES AS INDICATED, THE DIMENSION SHOWN MUST BE MET PRIOR TO WELDING. MAX. DISTORTION DUE TO WELDING NOT TO EXCEED ±.031 FROM NOM. DIM.

   F. UNLESS OTHERWISE SPECIFIED:
      ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R. OR CHAMFER.
      SURFACE ROUGHNESS NOT TO EXCEED $\overset{125}{\surd}$.

   G. UNDER NO CONDITIONS SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERIAL MOTION IN EXCESS OF .32 INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

   H. SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN NOTE 3G, THE AXIAL SPRING RATES SHALL NOT EXCEED 300#/IN. IN COMPRESSION AND 260#/IN TENSION. THE RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 1150#/IN.

   J. VENDOR SHIPPING REQUIREMENTS: BELLOWS ASSEMBLY MUST BE COMPLETELY FREE FROM OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSY WITHIN THE LIMITATIONS OF NOTE 3G.

   K. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NUMBER AND DATE OF FILLING AND SEALING, AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE).

   L. BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATIONS OF 3G ABOVE.

   M. THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE AND AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

   A. VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSIOD AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±.25 INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.

      SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	±1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	±16.5 G'S

      RANDOM VIBRATION-SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90CPS, CONSTANT TO 220CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

   B. SHOCK-75G'S FOR 11MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

   C. SUBSTAINED ACCELERATION-30G MAXIMUM.

   D. TEMPERATURE- +300°F TO -200°F.

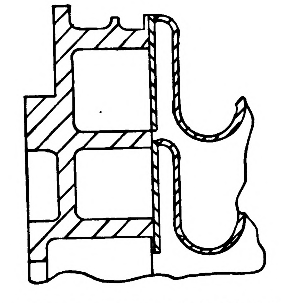
   E. HUMIDITY-100% RH. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V2).

5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

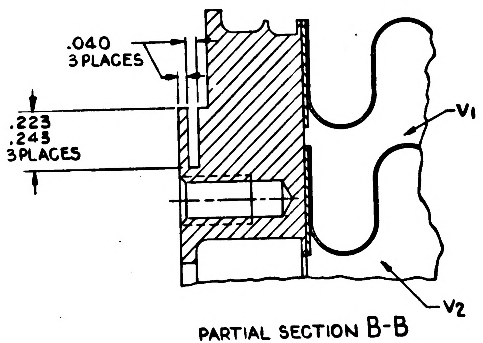
   A. PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} cc/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

   B. EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7±5 PSIA) AT ROOM TEMPERATURE (70±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

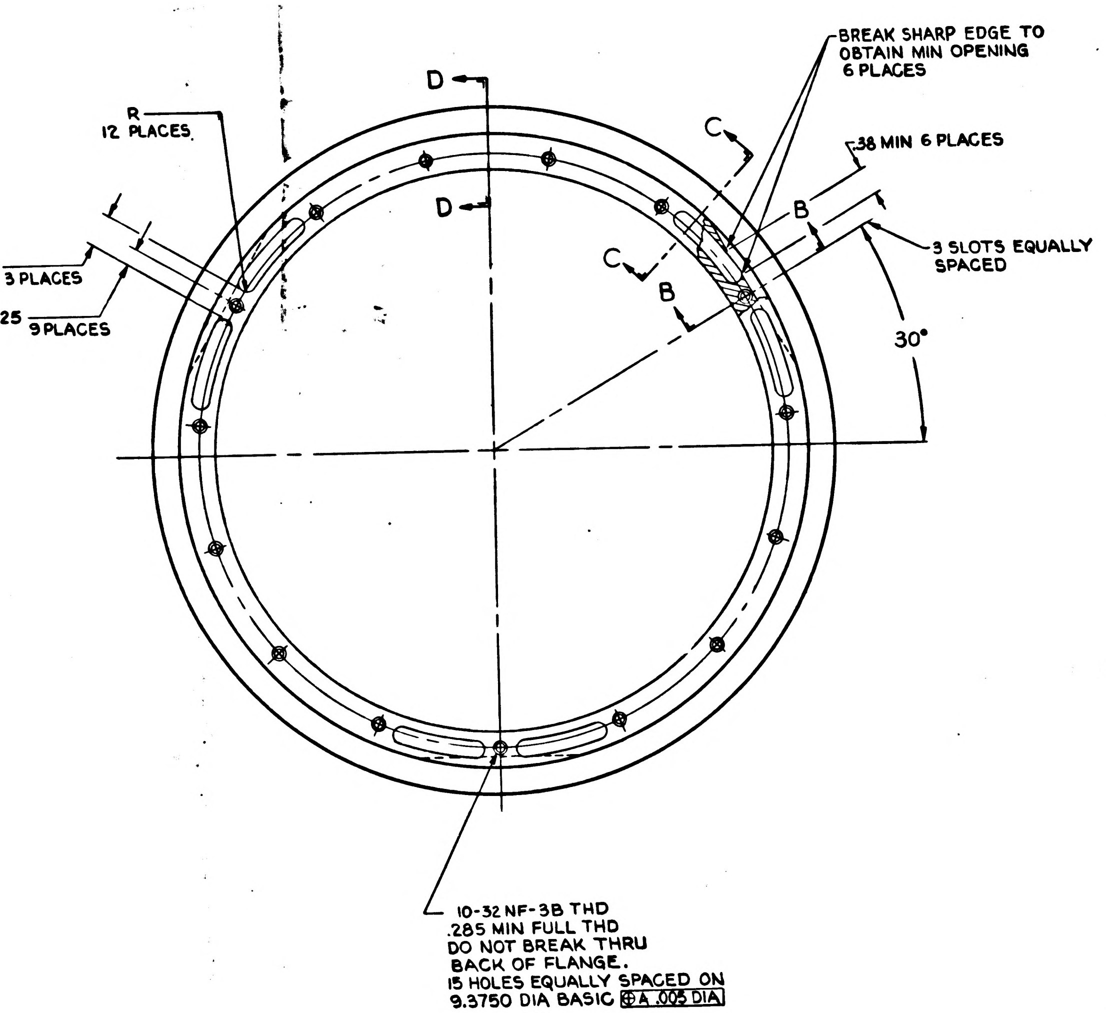
   C. WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} cc/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{4} MM HG.

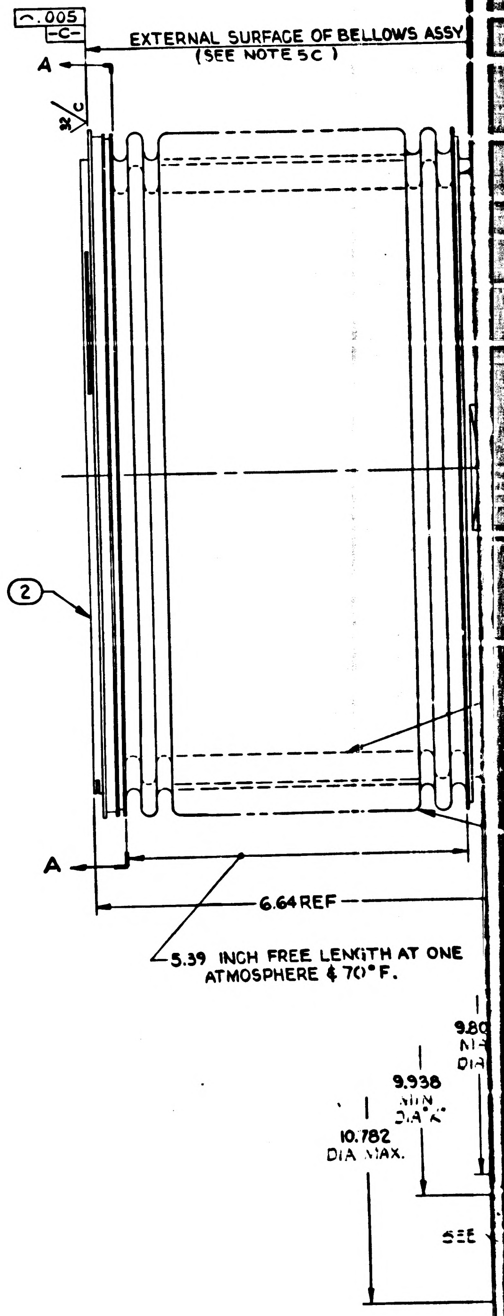


ALTERNATE ASSEMBLY METHOD



PARTIAL SECTION B-B
SCALE 4:1


D
D
C
C
B
B
R
12 PLACES
.50
3 PLACES
.25
9 PLACES
BREAK SHARP EDGE TO OBTAIN MIN OPENING 6 PLACES
.38 MIN 6 PLACES
3 SLOTS EQUALLY SPACED
30°
10-32 NF-3B THD
.285 MIN FULL THD
DO NOT BREAK THRU BACK OF FLANGE.
15 HOLES EQUALLY SPACED ON 9.3750 DIA BASIC ⊕A .005 DIA


⌒.005
-C-
EXTERNAL SURFACE OF BELLOWS ASSY
(SEE NOTE 5C)
A
A
②
6.64 REF
5.39 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
9.938
MIN
DIA "A"
10.782
DIA MAX.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.

2. MATERIAL:
FORGING PER QQ-S-763, CL321, STAINLESS STEEL FOR ITEMS ① AND ②.
MIL-S-6721 CL321 STAINLESS STEEL FOR ITEMS (3|4|5|6).

3. REQUIREMENTS:

A. PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072 FINISH E-300.

B ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

C. INERT HELI-ARC WELD ITEMS (3|4|5|6) TO ITEM ① AND WELD ITEMS (3|4|5|6) TO ITEM ② PER MIL-W-8611 AS SHOWN OR ALTERNATE ASSY METHOD.

D. WELDING TO BE INSPECTED PER MIL-I-6866.

E. DIAMETERS "C" THRU "H", "J" THRU "N", "P" THRU "V" AND 2 PLACES AS INDICATED, THE DIMENSION SHOWN MUST BE MET PRIOR TO WELDING. MAX. DISTORTION DUE TO WELDING NOT TO EXCEED ±.031 FROM NOM. DIM.

F. UNLESS OTHERWISE SPECIFIED:
ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS NOT TO EXCEED $\overset{125}{\checkmark}$.

G. UNDER NO CONDITIONS SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERIAL MOTION IN EXCESS OF .32 INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

H. SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN NOTE 3G, THE AXIAL SPRING RATES SHALL NOT EXCEED 300#/IN. IN COMPRESSION AND 260#/IN TENSION. THE RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 1150#/IN.

J. VENDOR SHIPPING REQUIREMENTS: BELLOWS ASSEMBLY MUST BE COMPLETELY FREE FROM OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSY WITHIN THE LIMITATIONS OF NOTE 3G.

K. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NUMBER AND DATE OF FILLING AND SEALING, AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE).

L. BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATIONS OF 3G ABOVE.

M. THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.

N. MAXIMUM RADIAL RESTRAINT OF 20 LBS. PERMITTED.

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE AND AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

A. VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSIOD AND RANDOM NOISE AS SPECIFIED BELOW, (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±.25 INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES).

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	±1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	±16.5 G'S

RANDOM VIBRATION-SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

B. SHOCK-75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

C. SUBSTAINED ACCELERATION - 30 G MAXIMUM.

D. TEMPERATURE- +300°F TO -200°F.

E. HUMIDITY-100% RH. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V2).

5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

A. PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} cc/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{4} mm HG EXTERNAL AND IN V_2.

B. EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7±5 PSIA) AT ROOM TEMPERATURE (70±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

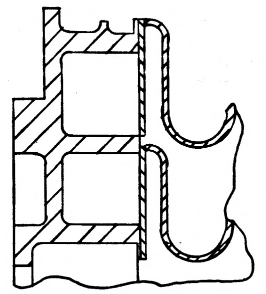
C WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} cc/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{4} MM HG.

6. A. DENTS IN CORRUGATIONS SHALL NOT EXCEED .09 IN THE LONGITUDINAL DIRECTION AND .18 IN THE CIRCUMFERENTIAL DIRECTION. THE DEPTH OF THE DENT SHALL NOT EXCEED 10% OF EITHER THE LONGITUDINAL OR CIRCUMFERENTIAL DIMENSION, WHICHEVER IS SMALLER.

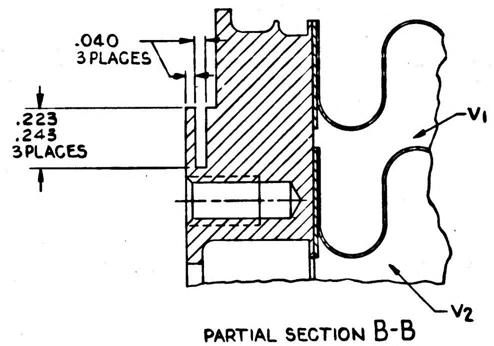
B. THERE SHALL BE NO GOUGES OR SCRATCHES IN THE DENTED AREA.

C. SCRATCH OR GOUGE DEPTH SHALL NOT EXCEED .0008 IN THE CREST OR VALLEY AND .0010 IN THE SIDEWALL OF THE CONVOLUTION.

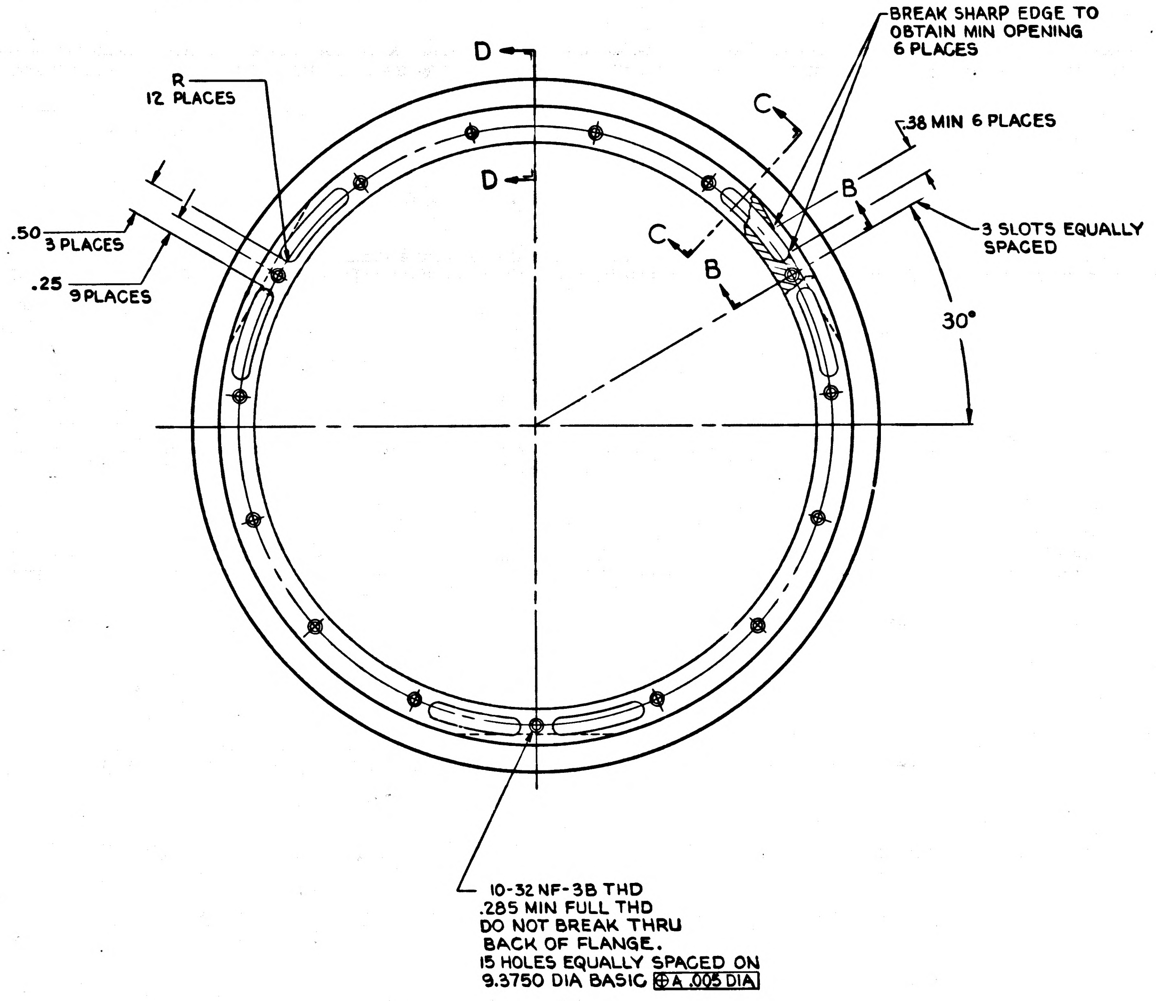
D. DENTS SHALL NOT HAVE LESS THAN .010 RADIUS.

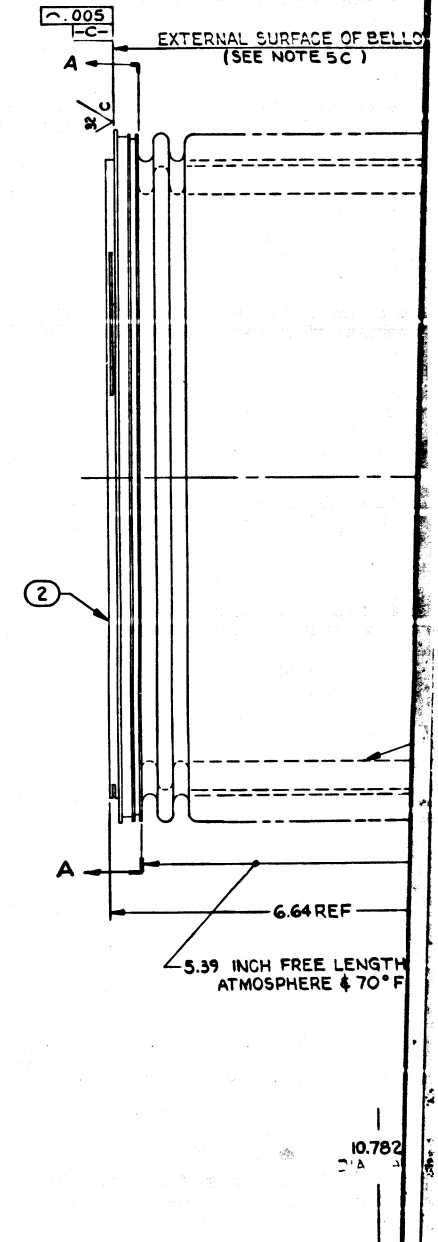


ALTERNATE ASSEMBLY METHOD

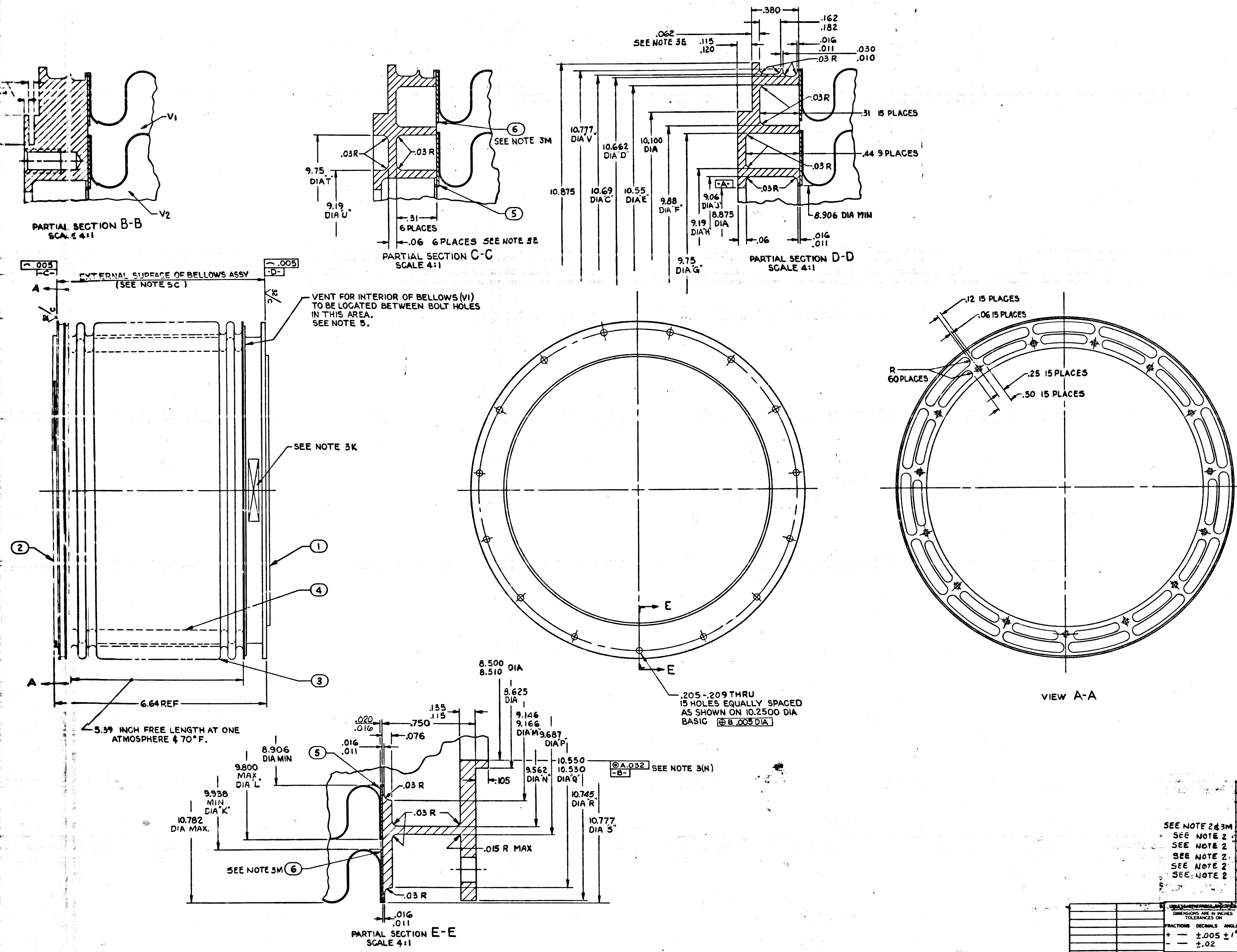


PARTIAL SECTION B-B
SCALE 4:1





REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		REVISED PER TDRR 16262			
B		REVISED PER TDRR 29502		14-JUL-66	
C		REVISED PER TDRR 36723		4 SEP 68	
D		REVISED PER TDRR 37138		26 DEC 68	
E		REVISED PER TDRR 37326		7 FEB 69	


PARTIAL SECTION B-B
SCALE 4:1
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
.03R
.03 R
9.75 DIA T
9.19 DIA U
.31 6 PLACES
.06 6 PLACES SEE NOTE 3E
6 SEE NOTE 3M
5
.380
.062 SEE NOTE 3E
.115 .120
.162 .182
.016 .011
.030 .010
.03 R
.31 15 PLACES
.44 9 PLACES
10.777 DIA V
10.662 DIA D
10.100 DIA
10.875
10.69 DIA C
10.55 DIA E
9.88 DIA F
9.06 DIA J
8.875 DIA
9.19 DIA H
9.75 DIA G
-A-
8.906 DIA MIN
.06
.016 .011
PARTIAL SECTION D-D
SCALE 4:1
.005 -C-
.005 -D-
EXTERNAL SURFACE OF BELLOWS ASSY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
A
1
2
3
4
6.64 REF
5.39 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
E
.205-.209 THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC ⊕ B .005 DIA
.12 15 PLACES
.06 15 PLACES
R 60 PLACES
.25 15 PLACES
.50 15 PLACES
VIEW A-A
8.500 8.510 DIA
8.625 DIA
.135 .115
.020 .016
.750
.076
.016 .011
9.146 9.166 DIA M
9.687 DIA P
8.906 DIA MIN
9.800 MAX DIA L
9.938 MIN DIA K
10.782 DIA MAX.
.105
9.562 DIA N
10.550 10.530 DIA Q
⊚ A .032 -B- SEE NOTE 3(N)
10.745 DIA R
10.777 DIA S
.03 R
.015 R MAX
SEE NOTE 3M 6
5
.016 .011
PARTIAL SECTION E-E
SCALE 4:1

	ITEM NO.	NO REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 2&3M	6	2	1898952-006	RING, ADAPTER, OUTER
SEE NOTE 2	5	2	1898952-005	RING, ADAPTER, INNER
SEE NOTE 2	4	1	1898952-004	BELLOWS, INNER
SEE NOTE 2	3	1	1898952-003	BELLOWS, OUTER
SEE NOTE 2	2	1	1898952-002	S/C END RING
SEE NOTE 2	1	1	1898952-001	OPTICS END RING

LIST OF PARTS AND MATERIALS

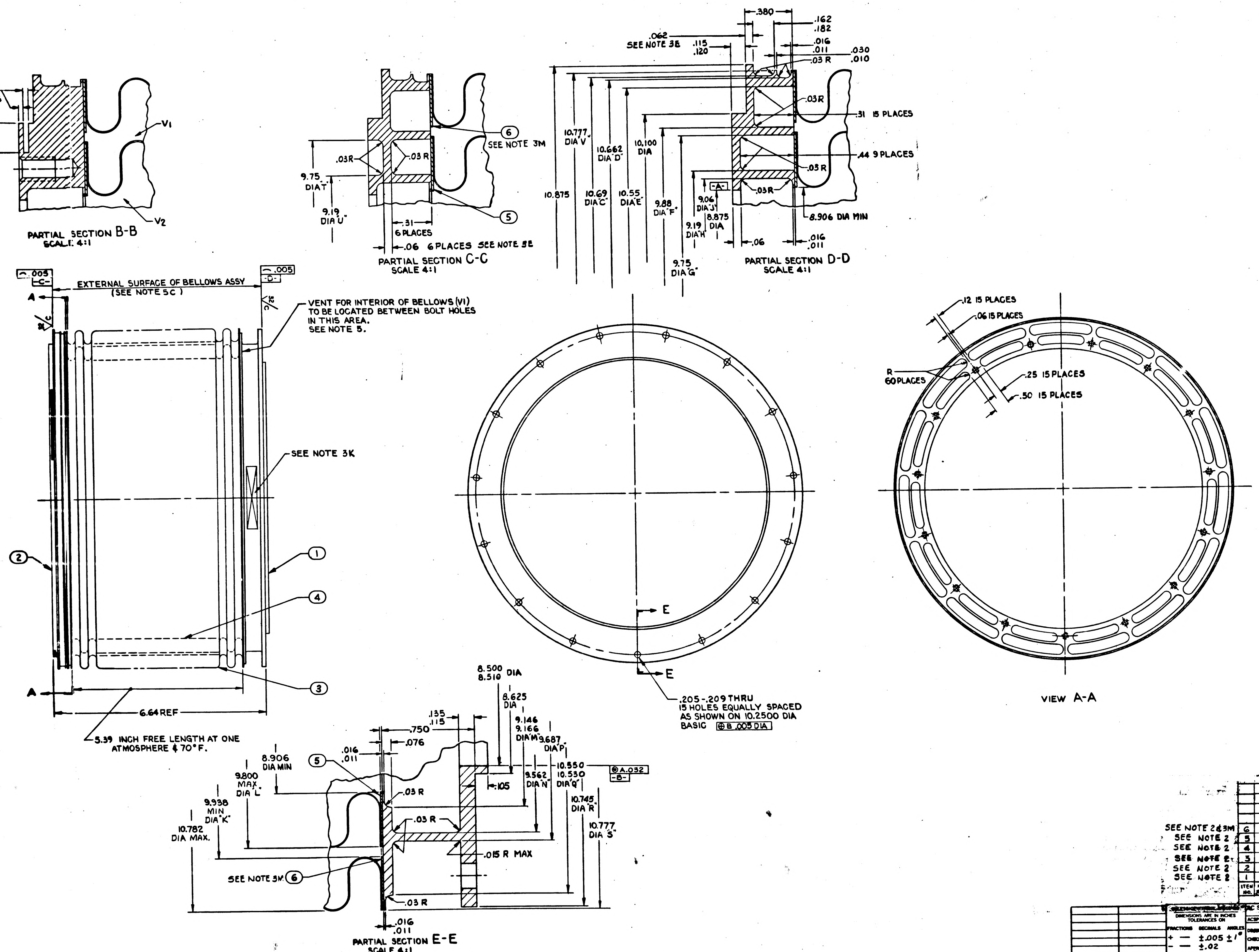
1899950-041	1899950-041	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES + — ±.005 ±1° − — ±.02 DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB CAMBRIDGE MASS DRAWN 13 Nov 64 DATE CHECKED 20 Nov 64 APPROVAL R Lotz 20 Nov 64 APPROVAL 20 Nov 64	MANNED SPACECRAFT CENTER HOUSTON, TEXAS BELLOWS, SEXTANT (INSEPARABLE ASSEMBLY)
NEXT ASSY	USED ON	MATERIAL SEE NOTE 2	12-1-64 NASA APPROVAL W. J. Rhine MIT APPROVAL	CODE IDENT NO. 80230 SIZE J 1898952
APPLICATION		CONTRACT NAS-9-497		SCALE 1:1 APPROX. WT. 7LB 40Z SHEET 1 OF 1

1898952 E

1898952 E

27/1898952

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD



PARTIAL SECTION B-B
SCALE 4:1
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
.03R
.03 R
9.75 DIA 'T'
9.19 DIA 'U'
.31 6 PLACES
.06 6 PLACES SEE NOTE 5E
SEE NOTE 3M
⑥
⑤
PARTIAL SECTION D-D
SCALE 4:1
.380
.062 SEE NOTE 3E
.115 .120
.162 .182
.016 .011
.030 .010
.03 R
.31 15 PLACES
.44 9 PLACES
10.777 DIA 'V'
10.662 DIA 'D'
10.100 DIA
10.875
10.69 DIA 'C'
10.55 DIA 'E'
9.88 DIA 'F'
9.06 DIA 'J'
8.875 DIA
9.19 DIA 'H'
9.75 DIA 'G'
-A-
8.906 DIA MIN
.06
.016 .011
.005 -C-
.005 -D-
EXTERNAL SURFACE OF BELLOWS ASSY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
A
①
②
③
④
6.64 REF
5.39 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
E
.205-.209 THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC ⊕ B .005 DIA
.12 15 PLACES
.06 15 PLACES
R 60 PLACES
.25 15 PLACES
.50 15 PLACES
VIEW A-A
8.500 8.510 DIA
8.625 DIA
.135 .115
.750
.076
.016 .011
8.906 DIA MIN
9.800 MAX DIA 'L'
9.938 MIN DIA 'K'
10.782 DIA MAX.
9.146 9.166 DIA 'M'
9.687 DIA 'P'
10.550 10.530 DIA 'Q'
⊕ A .032 -B-
.105
9.562 DIA 'N'
10.745 DIA 'R'
10.777 DIA 'S'
.03 R
.015 R MAX
SEE NOTE 3M ⑥
.016 .011
PARTIAL SECTION E-E
SCALE 4:1

SEE NOTE 2&3M	6	2	1898952-006	RING, ADAPTER, OUTER
SEE NOTE 2	5	2	1898952-005	RING, ADAPTER, INNER
SEE NOTE 2	4	1	1898952-004	BELLOWS, INNER
SEE NOTE 2	3	1	1898952-003	BELLOWS, OUTER
SEE NOTE 2	2	1	1898952-002	S/C END RING
SEE NOTE 2	1	1	1898952-001	OPTICS END RING
	ITEM NO.	NO REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

1899950-041	1899950-041
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — ±.005 ±1°
− — ±.02
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
CONTRACT NAS-9-497

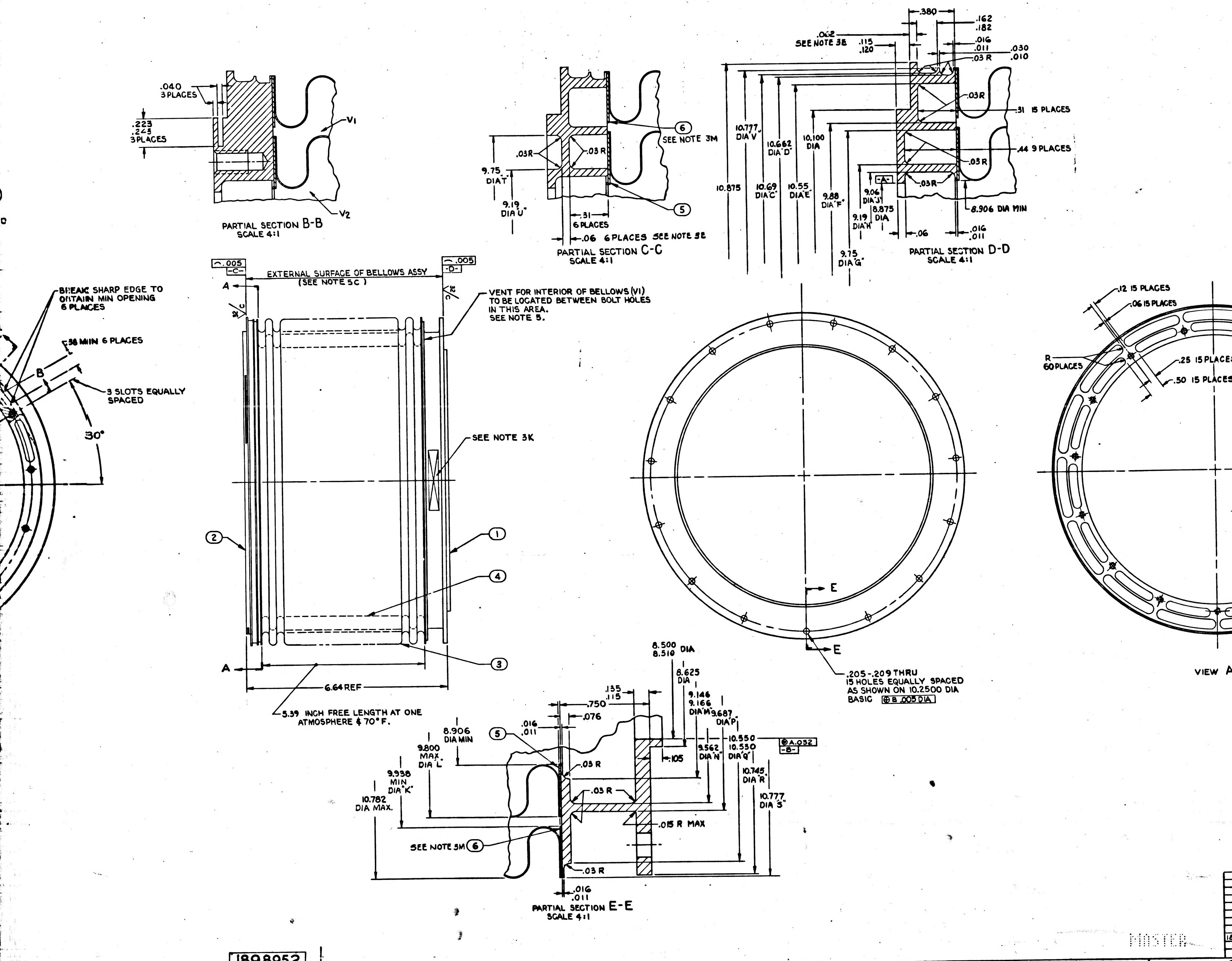
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 13 Nov 64
DATE
CHECKED 20 Nov 64
APPROVAL 20 Nov 64
APPROVAL 20 Nov 64
NASA APPROVAL W. J. Rhine 12-1-64
MIT APPROVAL 1 Dec 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS, SEXTANT
(INSEPARABLE ASSEMBLY)

CODE IDENT NO.
SIZE J
1898952
SCALE 1:1
APPROX. WT. 7LB 4OZ
SHEET 1 OF 1

1898952



PARTIAL SECTION B-B
SCALE 4:1
.040
3 PLACES
.223
.243
3 PLACES
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
.03R
.03 R
9.75
DIA T
9.19
DIA U
.31
6 PLACES
.06 6 PLACES SEE NOTE 3E
6
SEE NOTE 3M
5
PARTIAL SECTION D-D
SCALE 4:1
.062
SEE NOTE 3B
.115
.120
.380
.162
.182
.016
.011
.03 R
.030
.010
.03R
.31 15 PLACES
.44 9 PLACES
10.777
DIA V
10.662
DIA D
10.100
DIA
10.875
10.69
DIA C
10.55
DIA E
9.88
DIA F
9.06
DIA J
8.875
DIA
9.19
DIA H
9.75
DIA G
-A-
.06
.016
.011
8.906 DIA MIN
.005
-C-
.005
-D-
EXTERNAL SURFACE OF BELLOWS ASSY
(SEE NOTE 5C)
A
A
32
BREAK SHARP EDGE TO
OBTAIN MIN OPENING
6 PLACES
.38 MIN 6 PLACES
B
3 SLOTS EQUALLY
SPACED
30°
VENT FOR INTERIOR OF BELLOWS (V1)
TO BE LOCATED BETWEEN BOLT HOLES
IN THIS AREA.
SEE NOTE 5.
SEE NOTE 3K
1
2
3
4
6.64 REF
5.39 INCH FREE LENGTH AT ONE
ATMOSPHERE & 70° F.
E
E
.205-.209 THRU
15 HOLES EQUALLY SPACED
AS SHOWN ON 10.2500 DIA
BASIC ⊕ B .005 DIA
.12 15 PLACES
.06 15 PLACES
R
60 PLACES
.25 15 PLACES
.50 15 PLACES
VIEW A-A
8.500
8.510 DIA
8.625
DIA
.135
.115
.750
.076
.016
.011
9.146
9.166
DIA M
9.687
DIA P
8.906
DIA MIN
9.800
MAX
DIA L
9.938
MIN
DIA K
10.782
DIA MAX.
.03 R
.03 R
.105
9.562
DIA N
10.550
10.530
DIA Q
⊕ A .032
-B-
10.745
DIA R
10.777
DIA S
.015 R MAX
SEE NOTE 3M 6
5
.03 R
.016
.011
PARTIAL SECTION E-E
SCALE 4:1

SEE NOTE 2&3M	6	2	1898952-006	RING, AD[illegible]TER, OUTER
SEE NOTE 2	5	2	1898952-005	RING A[illegible]
SEE NOTE 2	4	1	1898952-004	BELLOWS INNER
SEE NOTE 2	3	1	1898952-003	BELLOWS OUTER
SEE NOTE 2	2	1	1898952-002	S/C ENT RING
SEE NOTE 2	1	1	1898952-001	OPT. CS[illegible] RING
	ITEM NO.	NO REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.005	±1°
- —	±.02	

DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 2

CONTRACT NAS-9-497

ACSP PN
DRAWN 13 Nov 64
CHECKED 20 Nov 64
APPROVAL 20 Nov 64
APPROVAL 20 Nov 64
NASA APPROVAL W. J. 12-1-64
MIT APPROVAL 1 Dec 64

BELLOWS, SEXTANT
(INSEPARABLE ASSEM

CODE IDENT NO.
SIZE J
189895
SCALE 1:1

NEXT ASSY	USED ON
1899950-041	1899950-041

APPLICATION

REVISION
SYM ZONE DESCRIPTION

1898952

MASTER

F-2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.

2. MATERIAL:

   QQ-S-763 CL321 STAINLESS STEEL FOR ITEMS ① AND ②.
   MIL-S-6721 CL321 STAINLESS STEEL FOR ITEMS ③④⑤⑥.

3. REQUIREMENTS:

   A. PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072 FINISH E-300.

   B. ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

   C. INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611 AS SHOWN OR ALTERNATE ASSY METHOD.

   D. WELDING TO BE INSPECTED PER MIL-I-6866.

   E. DIAMETERS "C" THRU "H", "J" THRU "N", "P" THRU "V" AND 2 PLACES AS INDICATED, THE DIMENSION SHOWN MUST BE MET PRIOR TO WELDING. MAX. DISTORTION DUE TO WELDING NOT TO EXCEED ±.031 FROM NOM. DIM.

   F. UNLESS OTHERWISE SPECIFIED:
      ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R. OR CHAMFER.
      SURFACE ROUGHNESS NOT TO EXCEED $\overset{125}{\surd}$.

   G. UNDER NO CONDITIONS SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERIAL MOTION IN EXCESS OF .32 INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

   H. SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN NOTE 3G, THE AXIAL SPRING RATES SHALL NOT EXCEED 300#/IN. IN COMPRESSION AND 260#/IN TENSION. THE RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 1150#/IN.

   J. VENDOR SHIPPING REQUIREMENTS: BELLOWS ASSEMBLY MUST BE COMPLETELY FREE FROM OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSY WITHIN THE LIMITATIONS OF NOTE 3.

   K. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NUMBER AND DATE OF FILLING AND SEALING, AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE).

   L. BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATIONS OF 3F ABOVE.

   M. THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE AND AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

   A. VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSIOD AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±.25 INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.

      SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5CPS IN 15 MINUTES).

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	±1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	±16.5 G'S

      RANDOM VIBRATION-SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90CPS, CONSTANT TO 220CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

   B. SHOCK - 75G'S FOR 11MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

   C. SUBSTAINED ACCELERATION - 30G MAXIMUM.

   D. TEMPERATURE - +300°F TO -200°F.

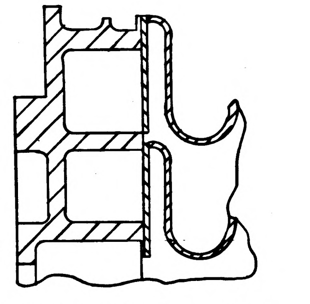
   E. HUMIDITY - 100% RH. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V2).

5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

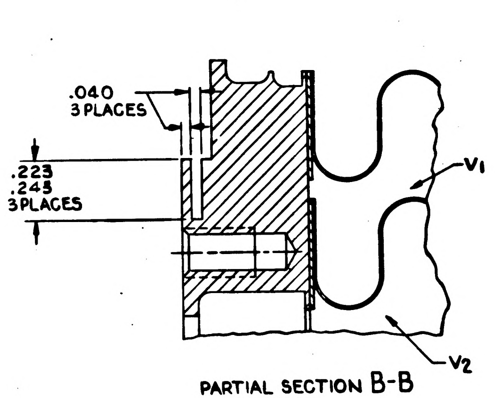
   A. PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} cc/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

   B. EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7±5 PSIA) AT ROOM TEMPERATURE (70±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

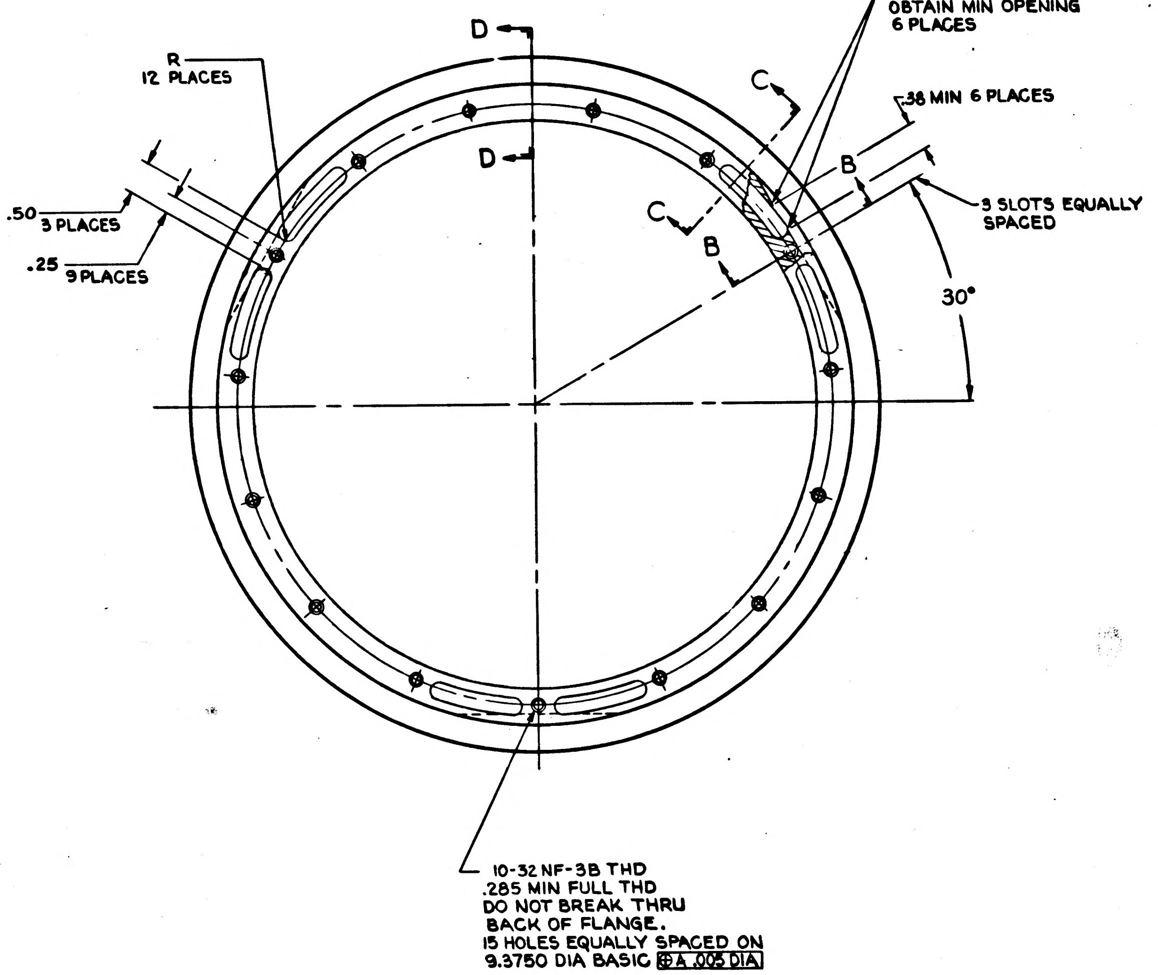
   C. WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} cc/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{4} MM HG.

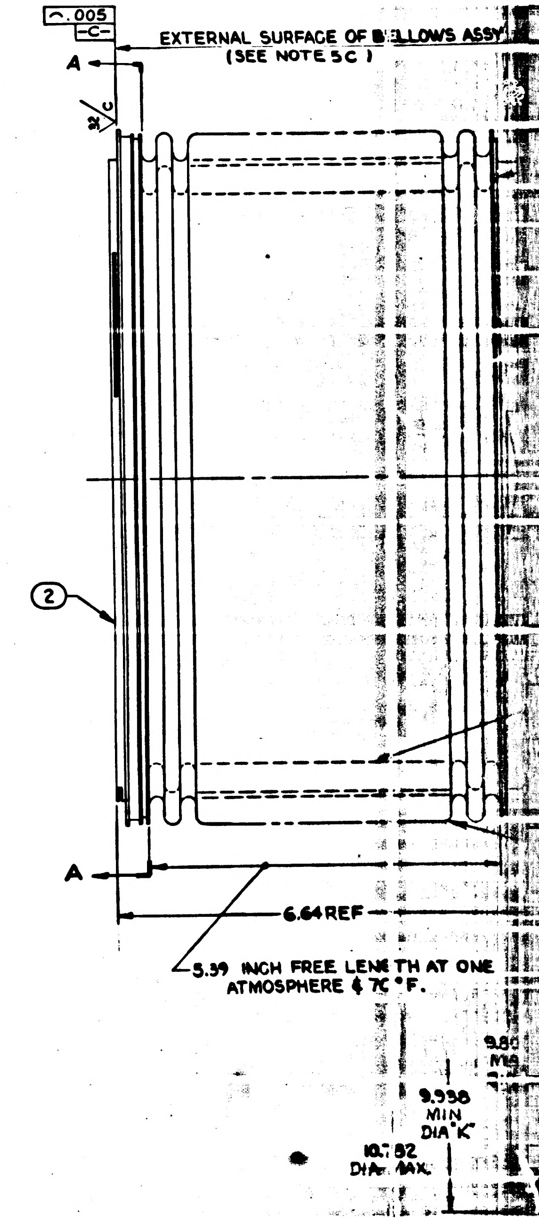


ALTERNATE ASSEMBLY METHOD



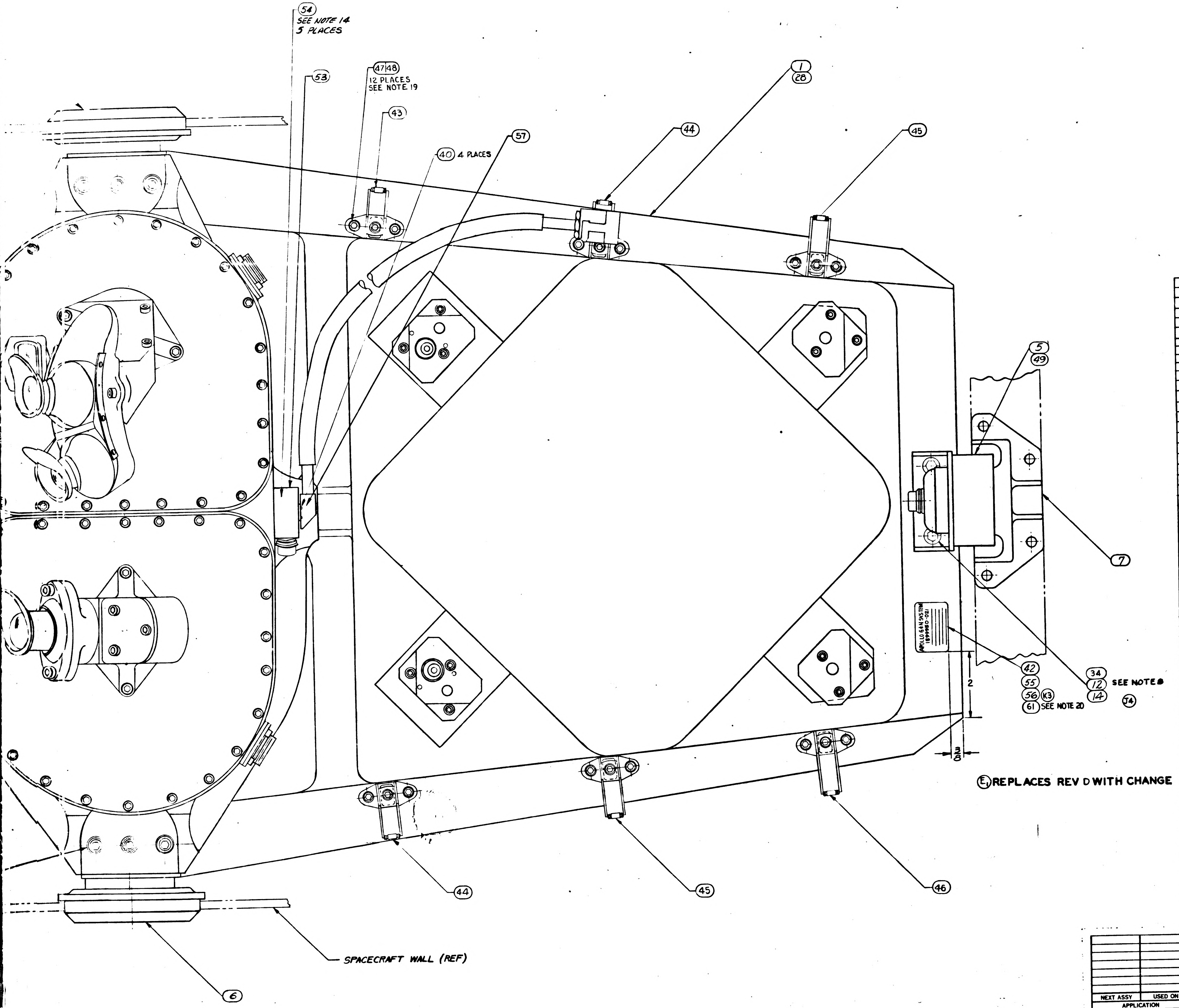
PARTIAL SECTION B-B
SCALE 4:1





.005
-C-
A
EXTERNAL SURFACE OF BELLOWS ASSY
(SEE NOTE 5C)
②
A
6.64 REF
5.39 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
9.80
9.938
MIN
DIA "K"
10.32
DIA MAX
SEE

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGES		[illegible]	WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		29 AUG 63	RWG
G_2		REVISED PER TDRR NO. 03098			WK 9/18/63
H_2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J_6		REVISED PER TDRR NO. 04990		17 DEC 63	
K_9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L_2		REVISED PER TDRR NO. 06742		6 MAR 64	WK
M		REVISED PER TDRR NO. 07072		1 APR 64	JJJ
N		REVISED PER TDRR 09654		11 JUN 64	WP MEM
P		REVISED PER TDRR 11914		4 SEP 64	JWP DAS
R_1		REVISED PER TDRR 12536		25 SEP 64	EL CP
S		REVISED PER TDRR 13157		16 OCT 64	JWP
T		REVISED PER TDRR 13468		27 OCT 64	J
U		REVISED PER TDRR 14671		14 DEC 64	
V		REVISED PER TDRR 14672		19 DEC 64	WP
W		REVISED PER TDRR 16672		25 [illegible] 65	DAS
Y		REVISED PER TDRR 18533		26 APR 65	ZJJ W.D.
Z		REVISED PER TDPR 20249		25 JUN 65	RTP
AA		REVISED PER TDRR 22735		4 OCT 65	RLP CP



Ⓔ REPLACES REV D WITH CHANGE

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1									63	2011000-021	OPTICAL UNIT
	1								62	2011000-011	OPTICAL UNIT
1	1	1	1						61	1014650-19	PLATE, IDENTIFICATION
			1						60	1011000-004	OPTICAL UNIT
				1					59	1011000-002	OPTICAL UNIT
					1				58	1011000-001	OPTICAL UNIT
			1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
				1					56	1014650-18	PLATE, IDENTIFICATION
					1				55	1014650-17	PLATE, IDENTIFICATION
5	5	5		≠					54	1011625-39	SCREW-SOCKET HEAD, CAP
1	1	1		≠					53	1021407	ADAPTER PLATE ASSY COOL. HOSE BYP
		1		≠					52	2011000	OPTICAL UNIT
1	1	1		≠					51	1338952	BELLOWS ASSEMBLY SXT
2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1	1	1	≠	≠				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
12	12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
1	1	1	1	1	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
2	2	2	2	2	2	2	2		45	1010400-3	↓
2	2	2	2	2	2	2	2		44	1010400-2	↓
1	1	1	1	1	1	1	1		43	1010400-1	↓
				≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
				~~4~~	~~4~~	~~4~~			41	~~1006997~~	~~WASHER, PLAIN FLAT~~
			4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
				≠	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
				≠	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
1	1	1	1	1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			31	1899997-002	↓
1	1	1	1	1	1	1			30	1899996-001	↓
1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
							4		25	MS20005-12	BOLT, INTERNAL WRENCHING
						1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
							1		22	1899954-002	SEAL, BELLOWS
							1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
							1		19	1899953-002	SEAL, BELLOWS
							1		18	1899953-001	SEAL, BELLOWS
							3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
							2		12	NAS145-11	BOLT - INTERNAL WRENCHING
3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
							3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
				1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
				2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
							1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

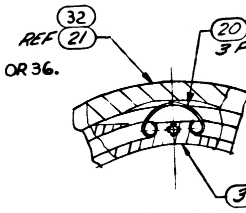
CODE IDENT NO.	SIZE	
80230	J	1899950
SCALE FULL	SEE NOTE 12	SHEET 1 OF 1

AA 1899950

39

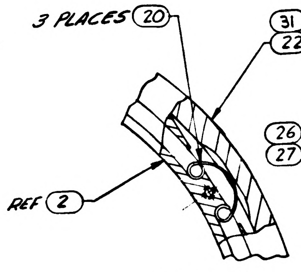
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR ㊱ UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3 COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21 OR 32, 22 OR 31 23 & 37 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ±1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.
20. ADD PART DASH NUMBER PER ND1002019.



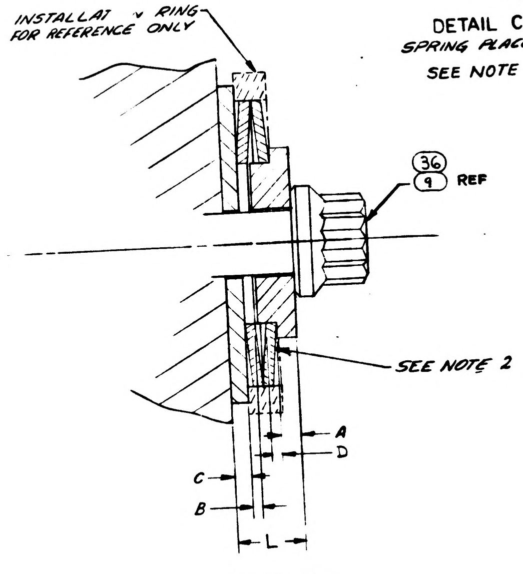
32
REF 21
20
3 PLACES
3 REF

DETAIL B
SPRING PLACEMENT
SEE NOTE 4



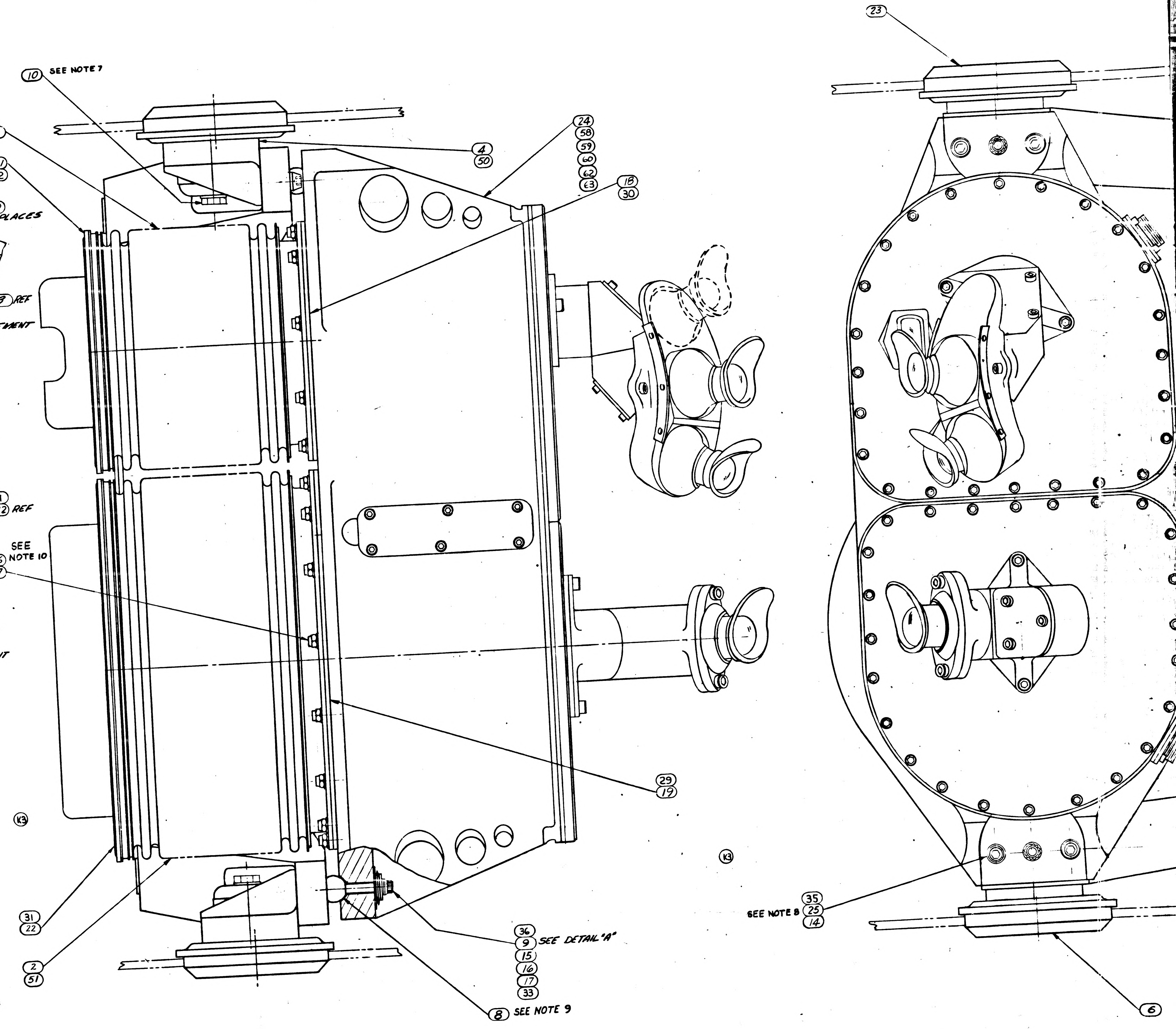
3 PLACES 20
31
22 REF
REF 2

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.



INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1



23
10 SEE NOTE 7
3
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K3
SEE NOTE 10
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K3
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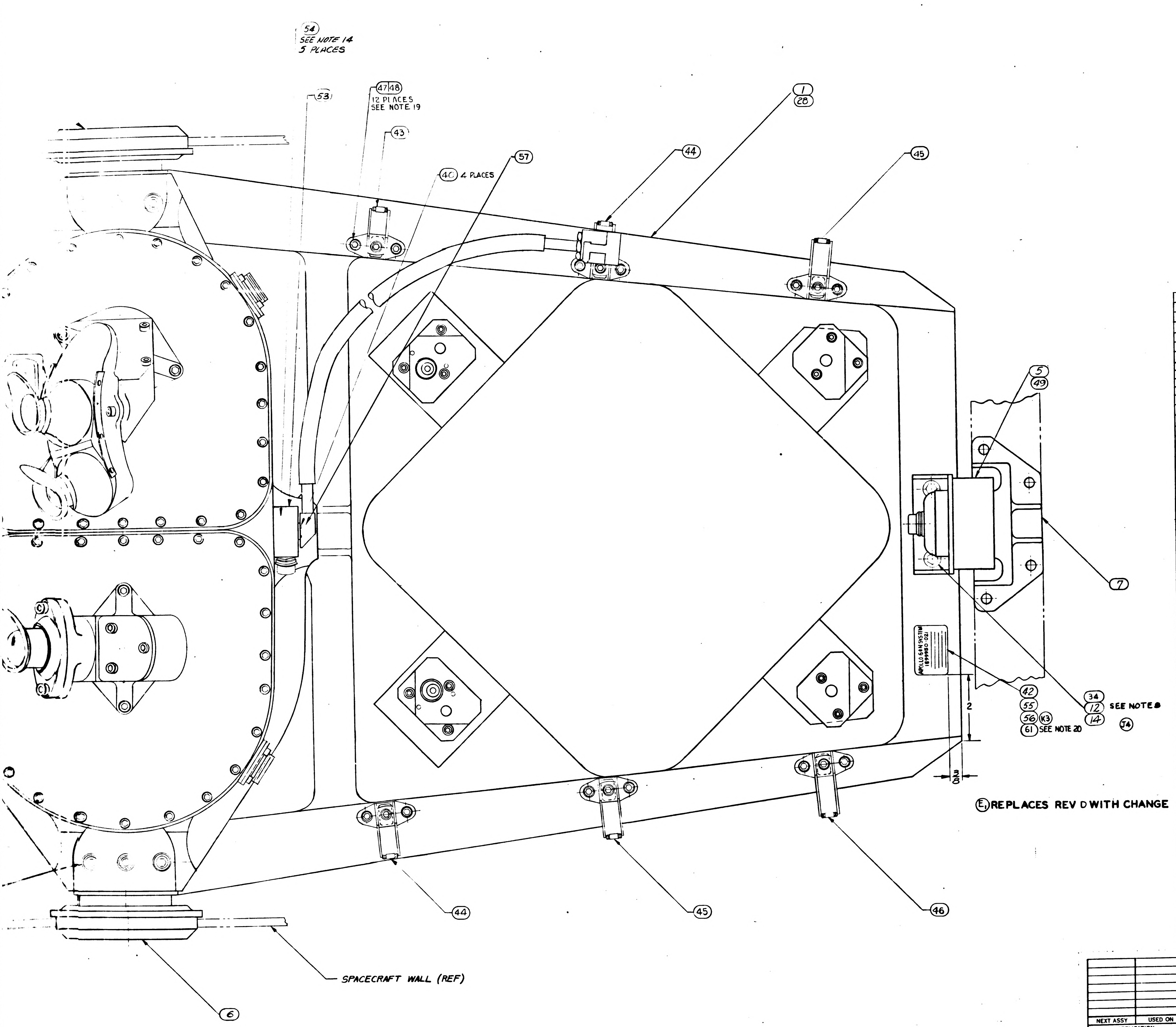
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
SEE NOTE 8 35
25
14
6



REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGE			WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		63	RWG
G2		REVISED PER TDRR NO. 03098			WK 9/18/63
H2		REVISED PER TDRR NO. 03668		2 OCT 63	WK
J6		REVISED PER TDRR NO. 04990		17 DEC 63	
K9		REVISED PER TDRR NO. 06253		16 FEB 64	WK
L2		REVISED PER TDRR NO. 06742		MAR 64	WK
M		REVISED PER TDRR NO. 07072		1 APR 64	
N		REVISED PER TDRR 09654		11 JUN 64	MBM
P		REVISED PER TDRR 11914		SEP 64	WP
R2		REVISED PER TDRR 12536		25 SEP 64	CP
S		REVISED PER TDRR 13157		16 OCT 64	WP
T		REVISED PER TDRR 13468		27 OCT 64	
U		REVISED PER TDRR 14671		4 DEC 64	
V		REVISED PER TDRR 14672		17 DEC 64	WP
W		REVISED PER TDRR 16672		25 FEB 65	DAS
Y		REVISED PER TDRR 18533		26 APR 65	RJJ
Z		REVISED PER TDRR 20249		25 JUN 65	RTP
AA		REVISED PER TDRR 22735		4 OCT 65	CP
AB		REVISED PER TDRR 23561		8 NOV 65	JJJ

LIST OF PARTS AND MATERIALS

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1							64	2011000-001	OPTICAL UNIT
1									63	2011000-021	OPTICAL UNIT
	1								62	2011000-011	OPTICAL UNIT
1	1	1	1						61	1014650-19	PLATE, IDENTIFICATION
			1						60	1011000-004	OPTICAL UNIT
				1					59	1011000-002	OPTICAL UNIT
					1				58	1011000-001	OPTICAL UNIT
			1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
				1					56	1014650-18	PLATE, IDENTIFICATION
					1				55	1014650-17	PLATE, IDENTIFICATION
5	5	5		≠					54	1011625-39	SCREW-SOCKET HEAD CAP
1	1	1		≠					53	1021407	ADAPTER PLATE ASSY COOL. HOSE BYP
		≠		≠					52	~~2011000~~	~~OPTICAL UNIT~~
1	1	1		≠					51	1838952	BELLOWS ASSEMBLY SXT
2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1	1	1	≠	≠				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
12	12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
1	1	1	1	1	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
2	2	2	2	2	2	2	2		45	1010400-3	
2	2	2	2	2	2	2	2		44	1010400-2	
1	1	1	1	1	1	1	1		43	1010400-1	
				≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
				~~4~~	~~4~~	~~4~~			~~41~~	~~1006997~~	~~WASHER, PLAIN FLAT~~
			4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
				≠	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
				≠	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
1	1	1	1	1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			31	1899997-002	
1	1	1	1	1	1	1			30	1899996-001	
1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
							4		25	MS20005-12	BOLT, INTERNAL WRENCHING
						1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
							1		22	1899954-002	SEAL, BELLOWS
							1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
							1		19	1899953-002	SEAL, BELLOWS
							1		18	1899953-001	SEAL, BELLOWS
							3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6		16	1899979	WASHER - SPRING BELLEVILLE
3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
							2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
3	3	3	3	3	3	3	3		10	1899980	BOLT - HEX HEAD
							3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H (INSEP) ASSY
				1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
				2	2	2	2		4	1899970.	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
							1		1	1899966	FRAME ASSY - NAVIGATION BASE

QUANTITY REQUIRED

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
E. KORACIN 11 APR 63
DRAWN
MALIKOWSKI 12 APR 63
CHECKED
J. HANN 12 APR 63
APPROVAL
A. KODEL 12 APR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

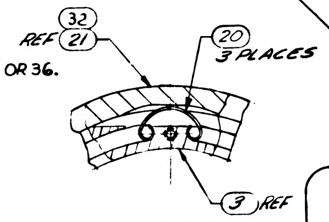
CODE IDENT NO. 80230
SIZE J
1899950
SCALE FULL SEE NOTE 15
SHEET 1 OF 1

1899950 AB

1899950 REV SH

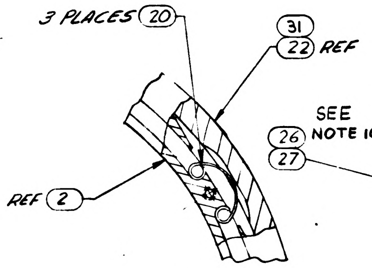
2/1899950

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM (9) OR (36) UNTIL L=(A+B+C+D+.008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3. COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21 OR 32, 22 OR 31 23 & 37 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 46 ±2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ±1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS - 6 OZ.
19. TORQUE ITEM 47 TO 30 ±2 IN LBS.
20. ADD PART DASH NUMBER PER ND1002019.



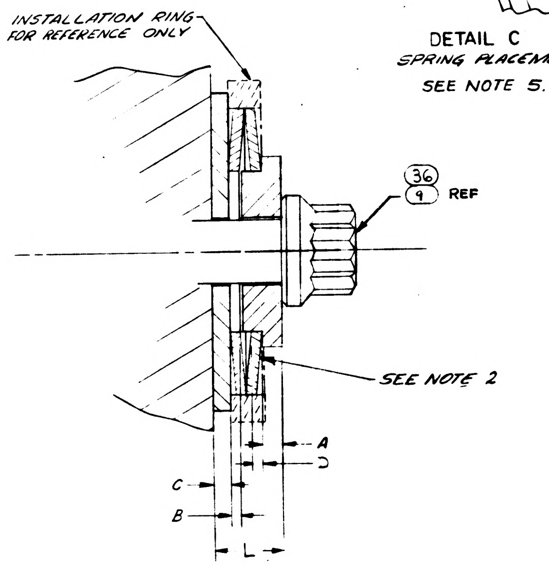
32
REF 21
20
3 PLACES
3 REF

DETAIL B
SPRING PLACEMENT
SEE NOTE 4



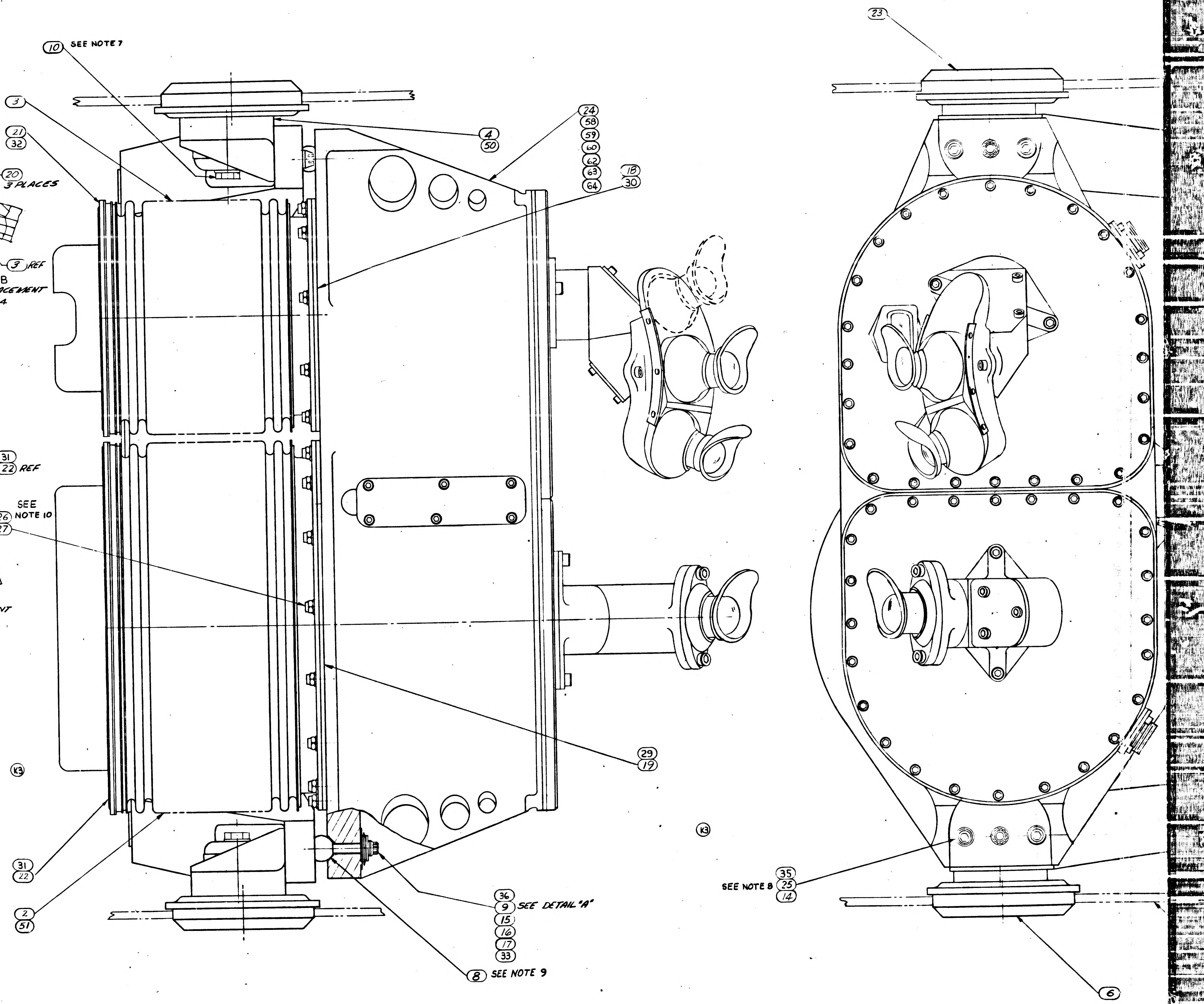
3 PLACES 20
31
22 REF
REF 2

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.



INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1



10 SEE NOTE 7
3
21
32
K3
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64
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SEE NOTE 10
26
27
29
19
K3
31
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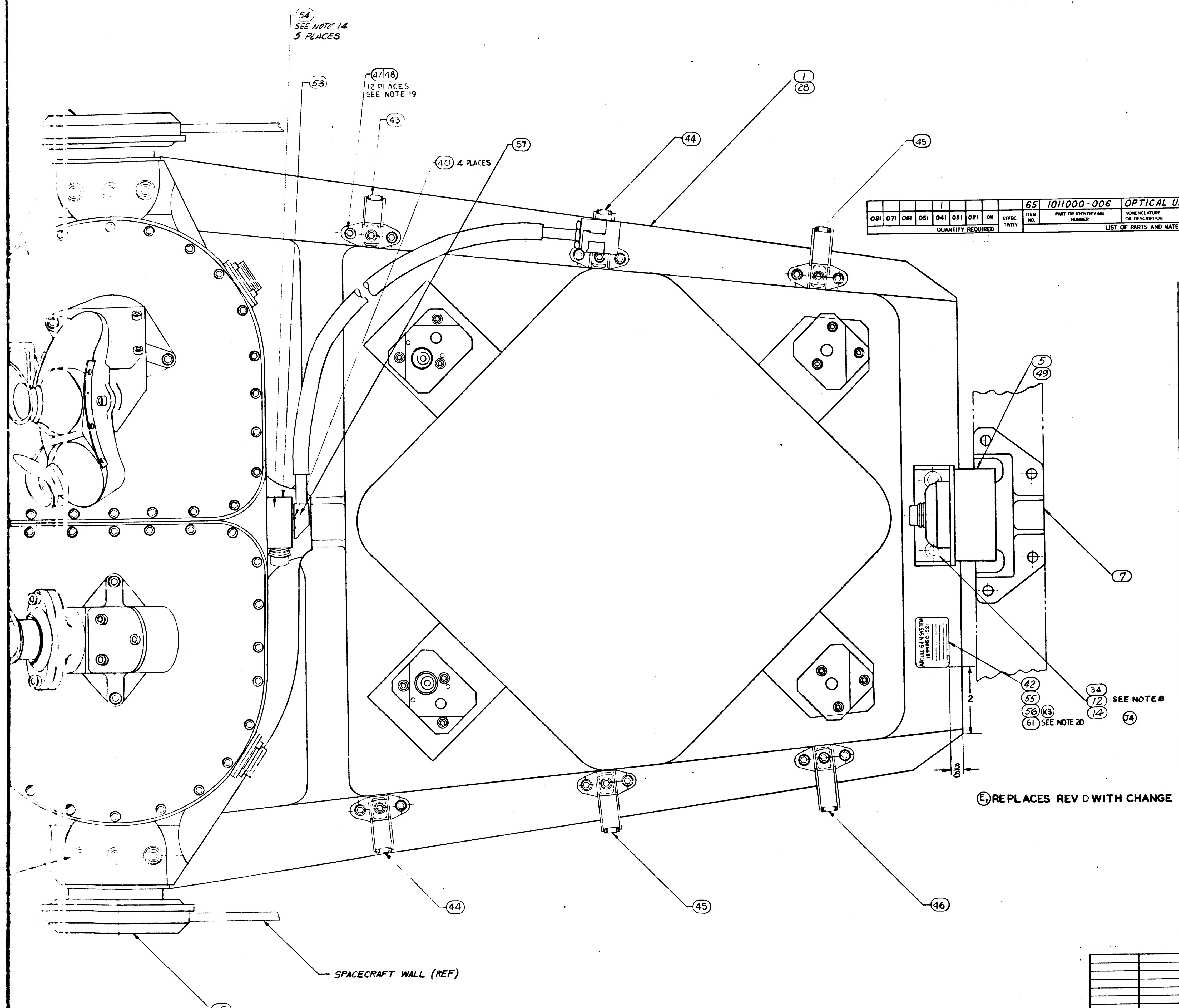
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
23
K3
SEE NOTE 8
35
25
14
6

1899950 REV SH

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
AC		REVISED PER TDRR-24556		14-DEC-65	

1899950 AC

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGE			WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		29 AUG 63	RWG
G2		REVISED PER TDRR NO. 03098			
H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J6		REVISED PER TDRR NO. 04990		17 DEC 63	
K9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L2		REVISED PER TDRR NO. 06742		3 MAR 64	WK
M		REVISED PER TDRR NO. 07072		1 APR 64	JJJ
N		REVISED PER TDRR 09654		11 JUN 64	JWP MGM
P		REVISED PER TDRR 11914		4 SEP 64	JWP DAS
R2		REVISED PER TDRR 12536		25 SEP 64	EL CP
S		REVISED PER TDRR 13157		16 OCT 64	JWP
T		REVISED PER TDRR 13468		27 OCT 64	
U		REVISED PER TDRR 14671		4 DEC 64	
V		REVISED PER TDRR 14672		17 DEC 64	JWP
W		REVISED PER TDRR 16672		25 FEB 65	DAS
Y		REVISED PER TDRR 18533		26 APR 65	
Z		REVISED PER TDRR 20249		25 JUN 65	RTF
AA		REVISED PER TDRR 22735		4 OCT 65	RJF CP
AB		REVISED PER TDRR 23561		8 NOV 65	



081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1					65	1011000-006	OPTICAL UNIT ASSY

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

Ⓔ REPLACES REV D WITH CHANGE

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1							64	2011000-001	OPTICAL UNIT
1									63	2011000-021	OPTICAL UNIT
	1								62	2011000-011	OPTICAL UNIT
1	1	1	1						61	1014650-19	PLATE, IDENTIFICATION
			1						60	1011000-004	OPTICAL UNIT
				≠					59	~~1011000-002~~	~~OPTICAL UNIT~~
					1				58	1011000-001	OPTICAL UNIT
			1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
				1					56	1014650-18	PLATE, IDENTIFICATION
					1				55	1014650-17	PLATE, IDENTIFICATION
5	5	5		≠					54	1011625-39	SCREW-SOCKET HEAD, CAP
1	1	1		≠					53	1021407	ADAPTER PLATE ASSY COOL. HOSE BYP
		≠		≠					52	~~2011000~~	~~OPTICAL UNIT~~
1	1	1		≠					51	1838952	BELLOWS ASSEMBLY SXT
2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1	1	1	≠	≠				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
12	12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
1	1	1	1	1	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
2	2	2	2	2	2	2	2		45	1010400-3	↓
2	2	2	2	2	2	2	2		44	1010400-2	↓
1	1	1	1	1	1	1	1		43	1010400-1	↓
				≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
				~~4~~	~~4~~	~~4~~			41	~~1006997~~	~~WASHER, PLAIN FLAT~~
			4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
				≠	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
				≠	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
1	1	1	1	1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			31	1899997-002	↓
1	1	1	1	1	1	1			30	1899996-001	↓
1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
							4		25	MS20005-12	BOLT, INTERNAL WRENCHING
						1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
							1		22	1899954-002	SEAL, BELLOWS
							1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
							1		19	1899953-002	SEAL, BELLOWS
							1		18	1899953-001	SEAL, BELLOWS
							3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
							2		12	NAS145-11	BOLT - INTERNAL WRENCHING
3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
							3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
				1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
				2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
							1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

F. KORACIN	DRAWN	11 APR 63
MALIKOWSKI	CHECKED	12 APR 63
J. HANN	APPROVAL	12 APR 63
A. KODEL	APPROVAL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

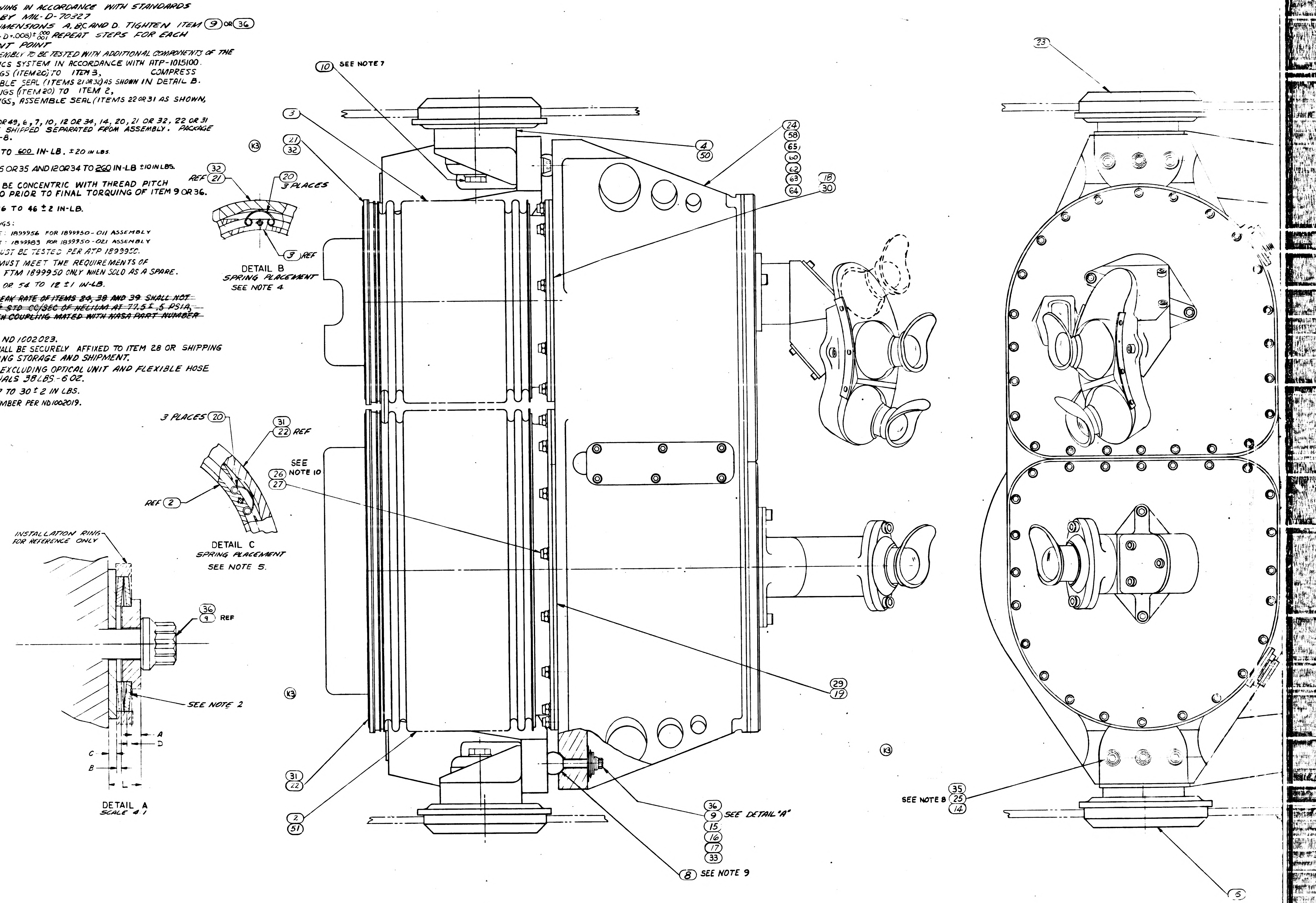
CODE IDENT NO. 80230
SIZE J
1899950
SCALE FULL
SHEET 1 OF 1

1899950 REV SH

2/1899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR (36) UNTIL $L=(A+B+C+D+.008)\pm^{.000}_{.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21 OR 32, 22 OR 31 23 & 37 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10-6 STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.
20. ADD PART DASH NUMBER PER ND1002019.



(10) SEE NOTE 7
3
21
32
K3
32
REF 21
20
3 PLACES
3 REF
4
50
24
58
65
60
62
63
64
18
30
23
3 PLACES 20
31
22 REF
REF 2
SEE NOTE 10
26
27
INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L
29
19
K3
31
22
2
51
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
SEE NOTE 8 35
25
14
5

DETAIL B
SPRING PLACEMENT
SEE NOTE 4

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.

DETAIL A
SCALE 4:1

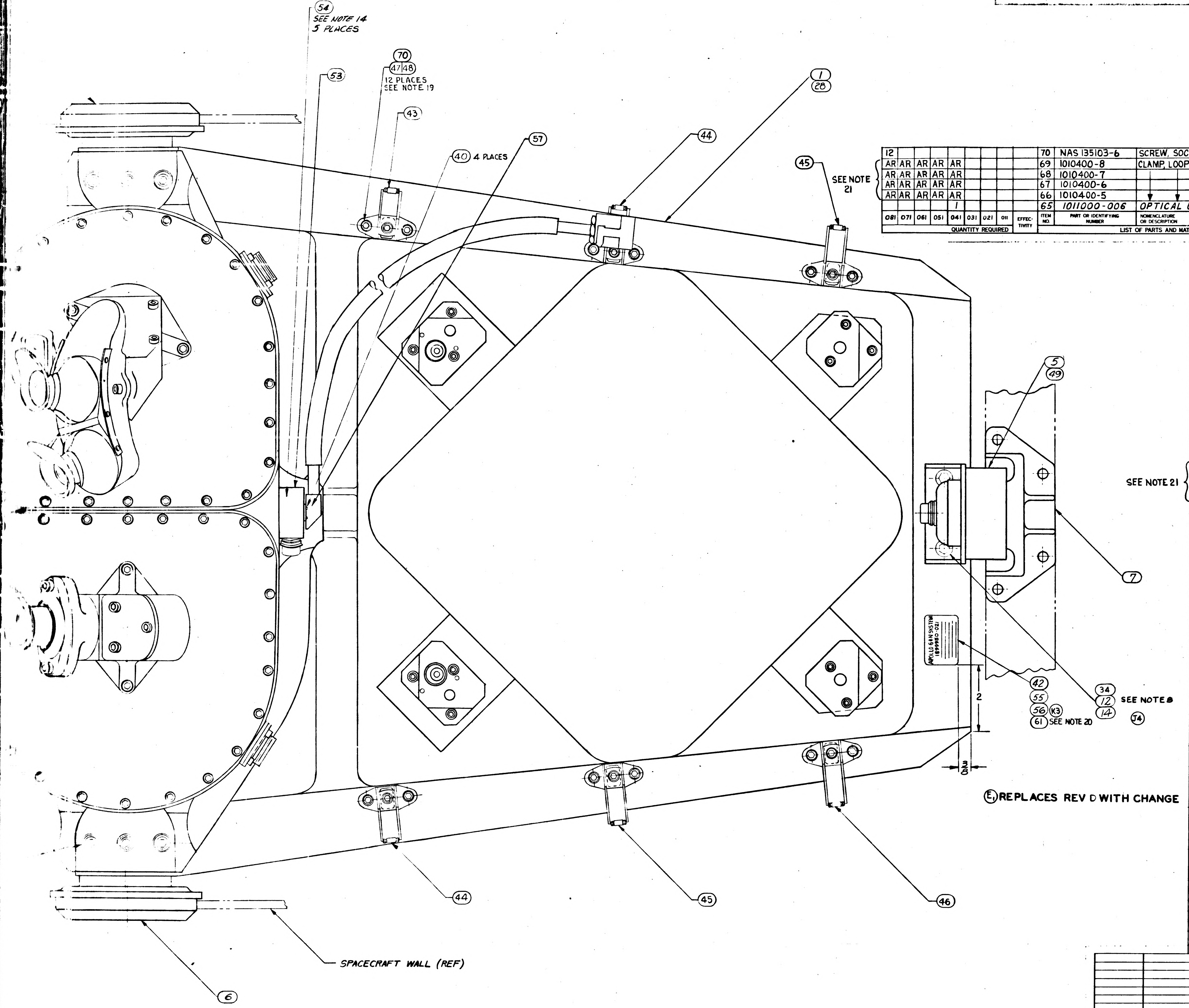
1899950 REV SH C1

1899950AD

SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
AC		REVISED PER TDRR-24556		14 DEC 65	
AD		REVISED PER TDRR 26145		16 FEB 66	DKD

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGE			WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		2 AUG 63	RWG
G_2		REVISED PER TDRR NO. 03098			WK 9/18/63
H_2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J_6		REVISED PER TDRR NO. 04990		17 DEC 63	
K_9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L_2		REVISED PER TDRR NO. 06742		10 MAR 64	WK
M		REVISED PER TDRR NO. 07072		1 APR 64	
N		REVISED PER TDRR 09654		11 JUN 64	MEN
P		REVISED PER TDRR 11914		4 SEP 64	JNP
R_2		REVISED PER TDRR 12536		25 SEP 64	EL CP
S		REVISED PER TDRR 13157		16 OCT 64	
T		REVISED PER TDRR 13468		27 OCT 64	
U		REVISED PER TDRR 14671		4 DEC 64	
V		REVISED PER TDRR 14672		7 DEC 64	NF
W		REVISED PER TDRR 16672		25 FEB 65	CAS
Y		REVISED PER TDRR 18533		26 APR 65	
Z		REVISED PER TDRR 20249		25 JUN 65	RTP
AA		REVISED PER TDRR 22735		4 OCT 65	RLP CP
AB		REVISED PER TDRR 23561		8 NOV 65	



(E) REPLACES REV D WITH CHANGE

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
12									70	NAS 135103-6	SCREW, SOCKET HD CAP
AR	AR	AR	AR	AR					69	1010400-8	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR					68	1010400-7	
AR	AR	AR	AR	AR					67	1010400-6	
AR	AR	AR	AR	AR					66	1010400-5	
				1					65	1011000-006	OPTICAL UNIT ASSY

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SEE NOTE 21 (items 66–69)

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1							64	2011000-001	OPTICAL UNIT
1									63	2011000-021	OPTICAL UNIT
	1								62	2011000-011	OPTICAL UNIT
1	1	1	1						61	1014650-19	PLATE, IDENTIFICATION
			1						60	1011000-004	OPTICAL UNIT
				≠					~~59~~	~~1011000-002~~	~~OPTICAL UNIT~~
					1				58	1011000-001	OPTICAL UNIT
			1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
				1					56	1014650-18	PLATE, IDENTIFICATION
					1				55	1014650-17	PLATE, IDENTIFICATION
5	5	5		≠					54	1011625-39	SCREW-SOCKET HEAD CAP
1	1	1		≠					53	1021407	ADAPTER PLATE ASSY COOL. HOSE BYP
		≠		≠					52	~~2011000~~	~~OPTICAL UNIT~~
1	1	1		≠					51	1898952	BELLOWS ASSEMBLY SXT
2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1	1	1	≠	≠				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
—	12	12	12	12	12	12	12		47	NAS 1351-3-6	SCREW-SOCKET HD CAP
AR	AR	AR	AR	AR	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	2	2	2		45	1010400-3	
AR	AR	AR	AR	AR	2	2	2		44	1010400-2	
AR	AR	AR	AR	AR	1	1	1		43	1010400-1	
				≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
				~~4~~	~~4~~	~~4~~			~~41~~	~~1006997~~	~~WASHER, PLAIN FLAT~~
			4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
				≠	~~1~~	~~1~~			~~39~~	~~1011599-16~~	~~PACKING, PREFORMED~~
				≠	~~1~~	~~1~~			~~38~~	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
1	1	1	1	1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			31	1899997-002	
1	1	1	1	1	1	1			30	1899996-001	
1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
							4		25	MS20005-12	BOLT, INTERNAL WRENCHING
						1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
							1		22	1899954-002	SEAL, BELLOWS
							1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
							1		19	1899953-002	SEAL, BELLOWS
							1		18	1899953-001	SEAL, BELLOWS
							3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
							2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
							3		9	MS 21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT (INSEP) ASSY
				1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
				2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
							1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SEE NOTE 21 (items 43–46)

1899950 AD

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

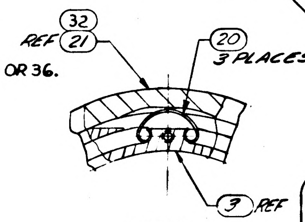
CODE IDENT NO. 80230
SIZE J
1899950
SCALE FULL
SHEET 1 OF 1

1899950 REV

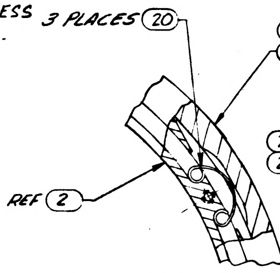
27 1899950

NOTES:

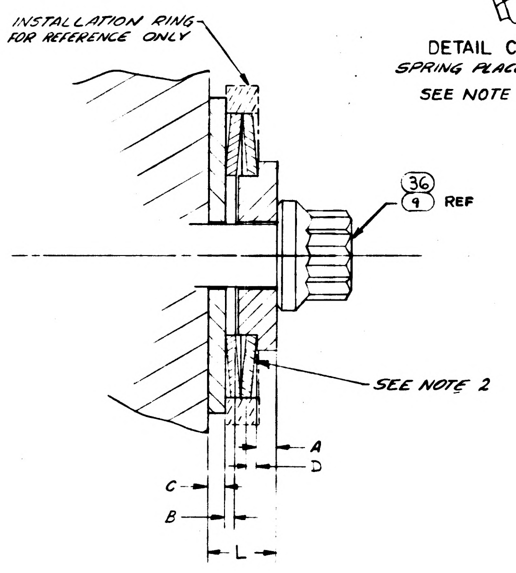
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. (J6) (K4) DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR (36) UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. (K5) ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3. COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. (K6) ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. (K9) (J5) ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21 OR 32, 22 OR 31 23 & 37 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. (J3) TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. (K7) TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. (K8) I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ±1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.
20. ADD PART DASH NUMBER PER ND1002019.
21. SELECT CLAMPS AS REQUIRED TO CONFORM TO HARNESS CONFIGURATION.


32
REF 21
20
3 PLACES
3 REF

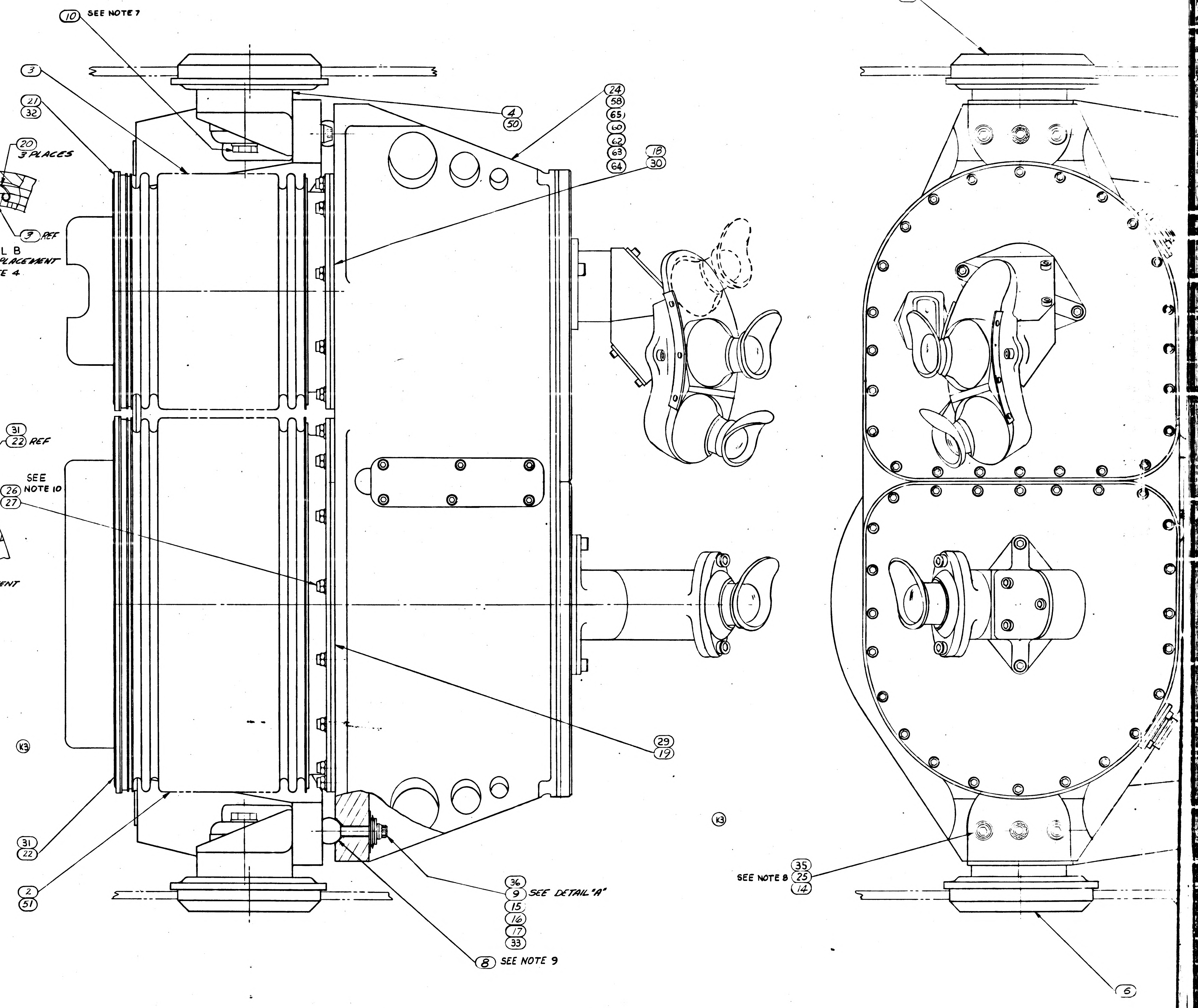
DETAIL B
SPRING PLACEMENT
SEE NOTE 4


3 PLACES 20
31
22 REF
REF 2

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.

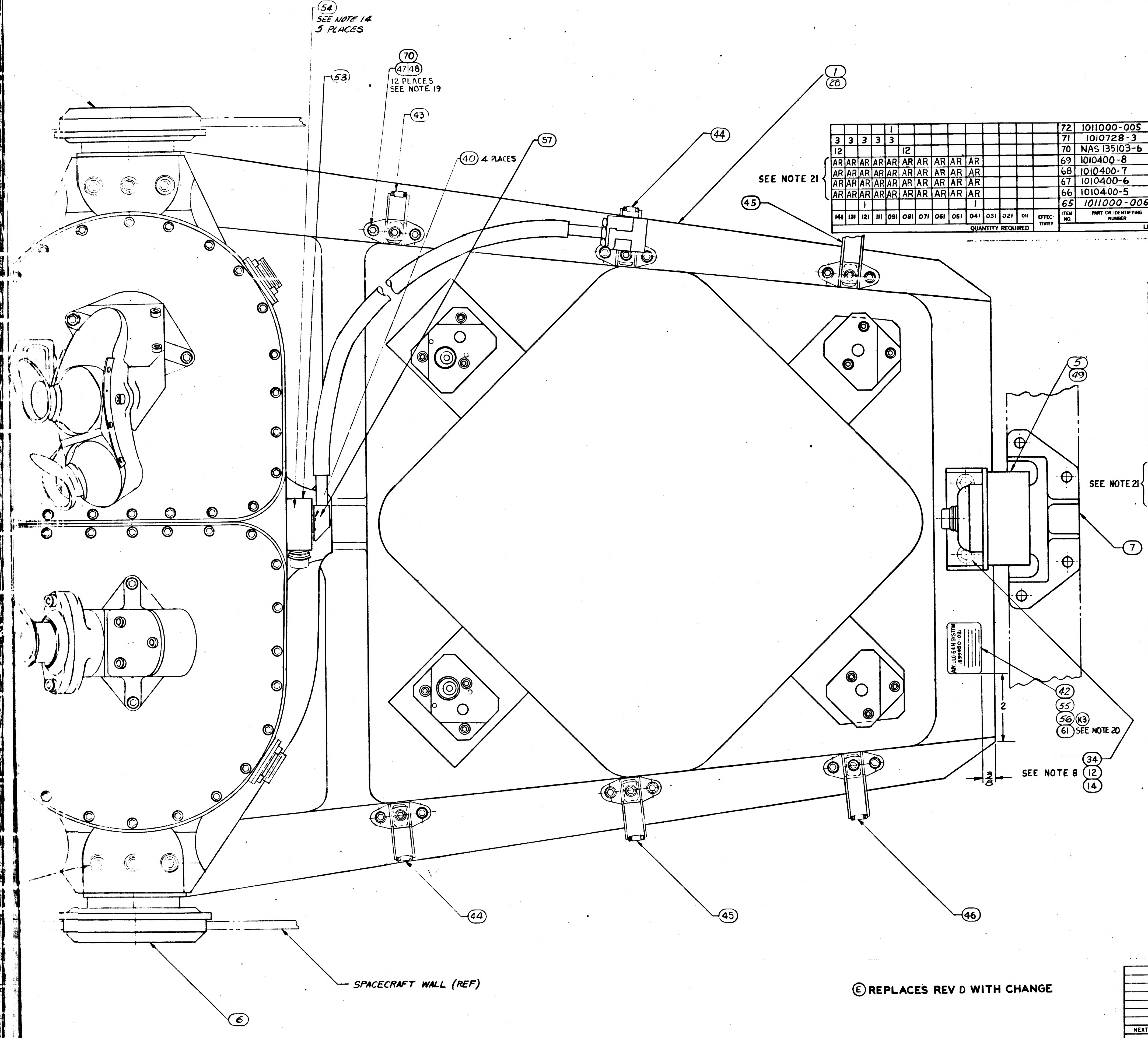

INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1


10 SEE NOTE 7
3
21
32
K3
4
50
24
58
65
60
62
63
64
18
30
23
SEE NOTE 10
26
27
29
19
K3
31
22
2
51
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
K3
SEE NOTE 8 35
25
14
6

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
AC		REVISED PER TDRR-24556		14 DEC 65	
AD		REVISED PER TDRR 26145		16 FEB 66	DKD
AE		REVISED PER TDRR-26435		1-MAR-66	CP

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGE		63	WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		29 AUG 63	RWG
G2		REVISED PER TDRR NO 03098			WK 9/18/63
H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J6		REVISED PER TDRR NO. 04990		17 DEC 63	
K9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L2		REVISED PER TDRR NO. 06742		MAR 64	WK
M		REVISED PER TDRR NO. 07072		1 APR 64	JJJ
N		REVISED PER TDRR 09654		11 JUN 64	JWP MEM
P		REVISED PER TDRR 11914		4 SEP 64	JWP DAS
R2		REVISED PER TDRR 12536		25 SEP 64	EL CP
S		REVISED PER TDRR 13157		16 OCT 64	JWP
T		REVISED PER TDRR 13468		27 OCT 64	
U		REVISED PER TDRR 14671		4 DEC 64	
V		REVISED PER TDRR 14672		17 DEC 64	JWP
W		REVISED PER TDRR 16672		25 FEB 65	DAS
Y		REVISED PER TDRR 18533		26 APR 65	
Z		REVISED PER TDRR 20243		25 JUN 65	RTF
AA		REVISED PER TDRR 22735		4 OCT 65	CP
AB		REVISED PER TDRR 23561		8 NOV	



141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1										72	1011000-005	OPTICAL UNIT
3	3	3	3	3										71	1010728-3	BOLT EXT WRENCHING
12					12									70	NAS 135103-6	SCREW, SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					69	1010400-8	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					68	1010400-7	
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					67	1010400-6	
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					66	1010400-5	
		1							1					65	1011000-006	OPTICAL UNIT ASSY

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1						1							64	2011000-001	OPTICAL UNIT
1					1									63	2011000-021	OPTICAL UNIT
			1			1								62	2011000-011	OPTICAL UNIT
1	1	1	1	1	1	1	1	1						61	1014550-19	PLATE, IDENTIFICATION
								1						60	1011000-004	OPTICAL UNIT
									≠					~~59~~	~~1011000-002~~	~~OPTICAL UNIT~~
										1				58	1011000-001	OPTICAL UNIT
		1		1				1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
									1					56	1014650-18	PLATE, IDENTIFICATION
										1				55	1014650-17	PLATE, IDENTIFICATION
5	5		5		5	5	5		≠					54	1011625-39	SCREW-SOCKET HEAD, CAP
1	1		1		1	1	1		≠					53	1021407	ADAPTER PLATE ASSY COOL. HOSE BYP
							≠		≠					52	~~2011000~~	~~OPTICAL UNIT~~
1	1		1		1	1	1		≠					51	1898952	BELLOWS ASSEMBLY SXT
2	2		2	2	2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1		1	1	1	1	1	1	≠	≠				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
	12	12	12	12	—	12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		45	1010400-3	
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		44	1010400-2	
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		43	1010400-1	
									≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
									~~4~~	~~4~~	~~4~~			~~41~~	~~1006997~~	~~WASHER, PLAIN FLAT~~
		4		4				4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
									≠	~~1~~	~~1~~			~~39~~	~~1011599-16~~	~~PACKING, PREFORMED~~
									≠	~~1~~	~~1~~			~~38~~	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
1	1	1	1	1	1	1	1	1	1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
					3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			31	1899997-002	
1	1	1	1	1	1	1	1	1	1	1	1			30	1899996-001	
1	1	1	1	1	1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24	24	24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
												4		25	MS20005-12	BOLT, INTERNAL WRENCHING
											1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
												1		22	1899954-002	SEAL, BELLOWS
												1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
												1		19	1899953-002	SEAL, BELLOWS
												1		18	1899953-001	SEAL, BELLOWS
												3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
												2		12	NAS145-11	BOLT - INTERNAL WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
												3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1	1	1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
		1							1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
		2							2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1		1				1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
												1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

Ⓔ REPLACES REV D WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

CODE IDENT NO.	SIZE	
80230	J	1899950
SCALE FULL	SEE NOTE 18	SHEET 1 OF 1

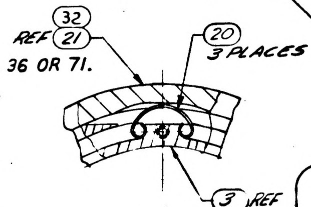
1899950AE

1899950 REV SH E

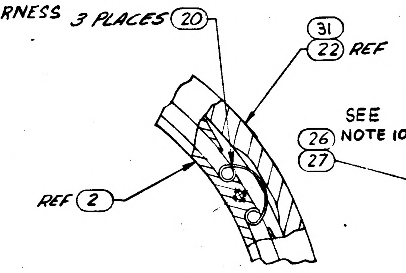
24 1899950

NOTES:

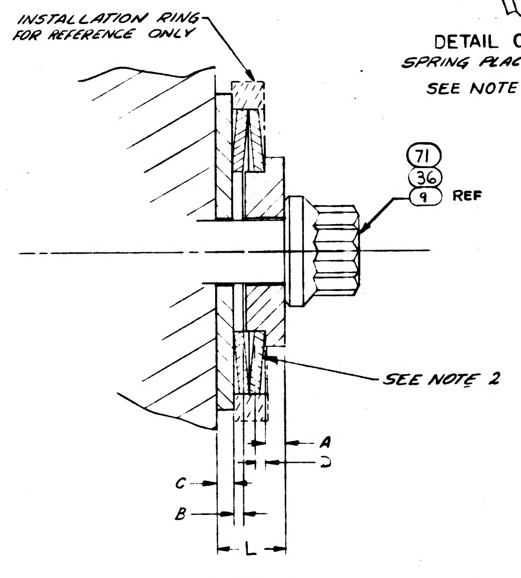
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨, ㊱ OR ㉑ UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3. COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21 OR 32, 22 OR 31 23 & 37 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9, 36 OR 71.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.
20. ADD PART DASH NUMBER PER ND1002019.
21. SELECT CLAMPS AS REQUIRED TO CONFORM TO HARNESS CONFIGURATION.


32
REF 21
20
3 PLACES
3 REF

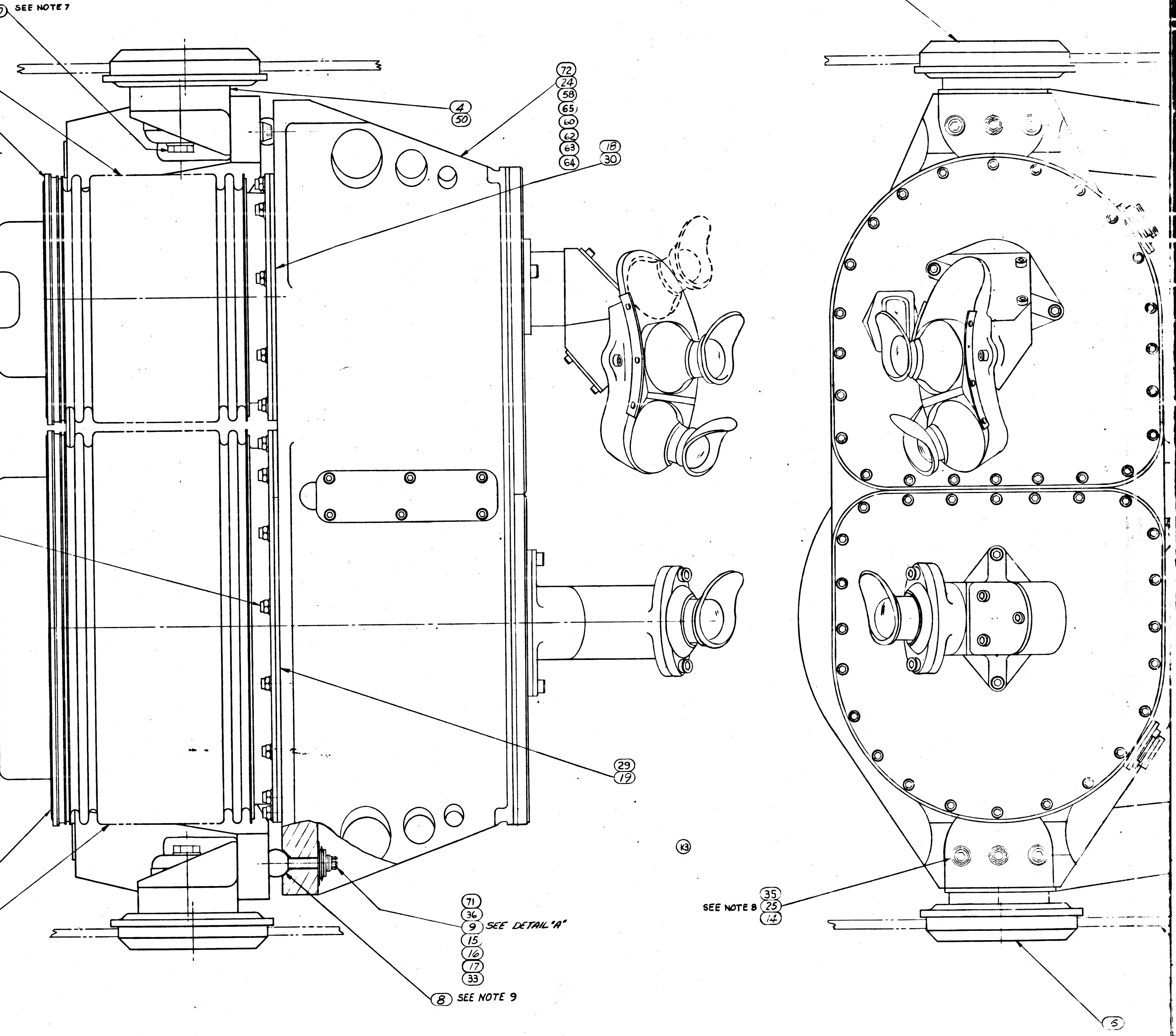
DETAIL B
SPRING PLACEMENT
SEE NOTE 4


3 PLACES 20
31
22 REF
REF 2

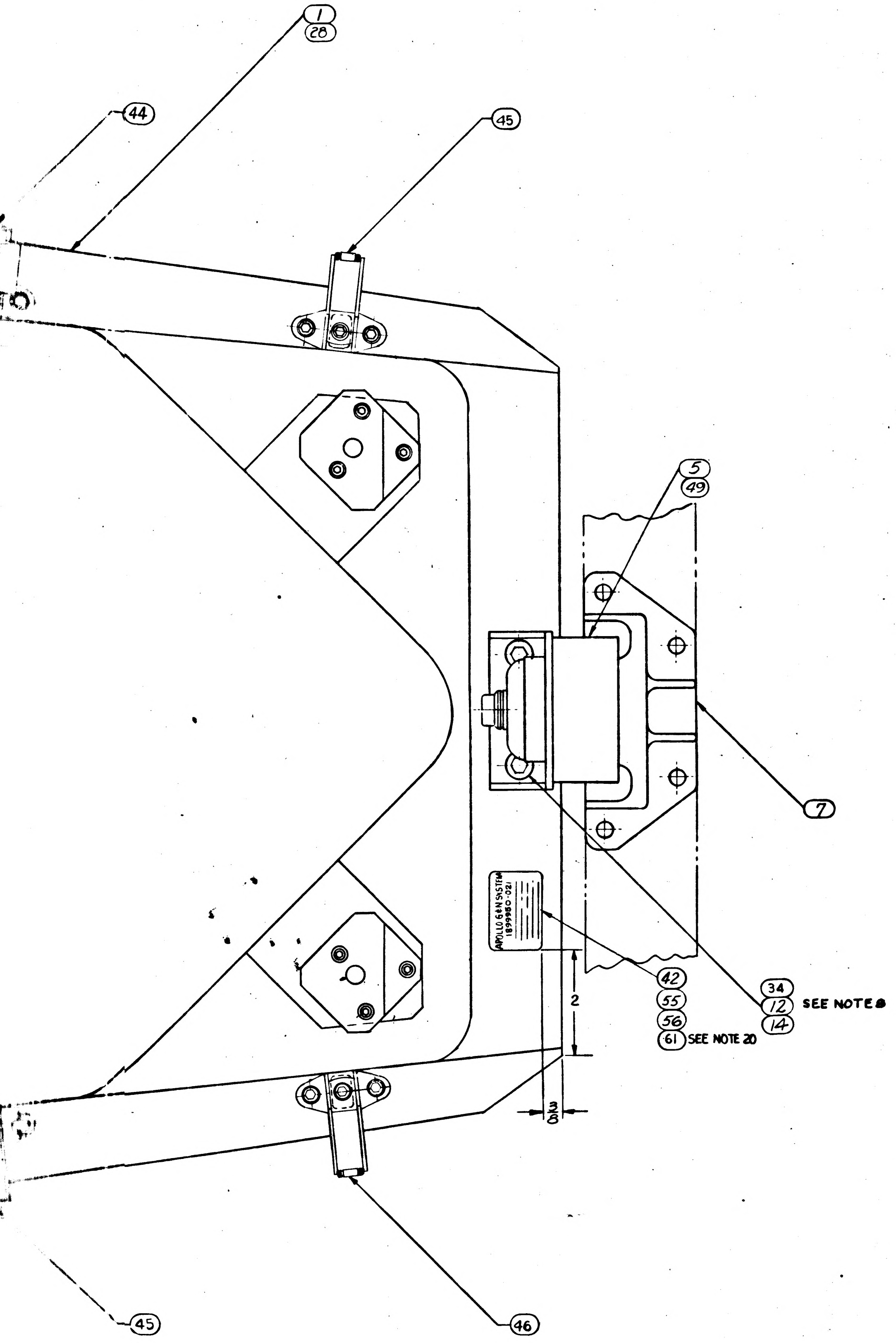
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.


INSTALLATION RING FOR REFERENCE ONLY
71
36
9 REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1


10 SEE NOTE 7
3
21
32
K3
4
50
72
24
58
65
60
62
63
64
18
30
23
SEE NOTE 10
26
27
29
19
K3
31
22
2
51
71
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
K3
SEE NOTE 8
35
25
14
5

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG NO.	DATE	APPROVED
	AF	REPLACES REV AE WITH CHANGE PER TDRR 27396	—	11 MAR 66	J J J



SEE NOTE 21 (items 66–69)

141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	2	2	2	2	2	2	2	2	2	2	2	2		73	1899994-011	FRONT ISOLATOR LOCKOUT PIN ASSY
				1										72	1011000-005	OPTICAL UNIT
3	3	3	3	3										71	1010728-3	BOLT EXT WRENCHING
12					12									70	NAS 135103-6	SCREW, SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					69	1010400-8	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					68	1010400-7	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					67	1010400-6	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					66	1010400-5	CLAMP, LOOP HINGED
		1							1					65	1011000-006	OPTICAL UNIT ASSY
	1						1							64	2011000-001	OPTICAL UNIT
1					1									63	2011000-021	OPTICAL UNIT
			1			1								62	2011000-011	OPTICAL UNIT
1	1	1	1	1	1	1	1	1						61	1014650-19	PLATE, IDENTIFICATION
								1						60	1011000-004	OPTICAL UNIT
									~~1~~					59	~~1011000-002~~	~~OPTICAL UNIT~~
										1				58	1011000-001	OPTICAL UNIT
		1		1				1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
									1					56	1014650-18	PLATE, IDENTIFICATION
										1				55	1014650-17	PLATE, IDENTIFICATION
5	5		5		5	5	5		~~5~~					54	1011625-39	SCREW-SOCKET HEAD, CAP
1	1		1		1'	1	1		~~1~~					53	1021407	ADAPTER PLATE ASSY COOL, HOSE BYP
							~~1~~		~~1~~					52	~~2011000~~	~~OPTICAL UNIT~~
1	1		1		1	1	1		~~1~~					51	1898952	BELLOWS ASSEMBLY SXT
2	2		2	2	2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1		1	1	1	1	1	1	~~1~~	~~1~~				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
	12	12	12	12		12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		45	1010400-3	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		44	1010400-2	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		43	1010400-1	CLAMP, LOOP HINGED
									~~1~~	~~1~~	1			42	1014650-9	PLATE, IDENTIFICATION
									~~4~~	~~4~~	~~4~~			41	~~1006997~~	~~WASHER, PLAIN FLAT~~
		4		4				4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
									~~1~~	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
									~~1~~	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~		37	~~1899999-011~~	~~ISOLATOR LOCKOUT SET (NAV. BASE)~~
					3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			31	1899997-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			30	1899996-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			28	1899982	FRAME ASSY, NAV, BASE
24	24	24	24	24	24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
												4		25	MS20005-12	BOLT, INTERNAL WRENCHING
											1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP ASSY)
												1		22	1899954-002	SEAL, BELLOWS
												1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
												1		19	1899953-002	SEAL, BELLOWS
												1		18	1899953-001	SEAL, BELLOWS
												3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
														13		
												2		12	NAS145-11	BOLT-INTERNAL WRENCHING
														11		
3	3	3	3	3	3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
												3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP ASSY)
1	1	1	1	1	1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP ASSY)
		1							1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
		2							2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1		1				1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
												1		1	1899966	FRAME ASSY-NAVIGATION BASE
QUANTITY REQUIRED															LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN C. KORACIN DATE 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
CONTRACT NAS9-497
NASA APPROVAL A. C. METZGER
MIT APPROVAL

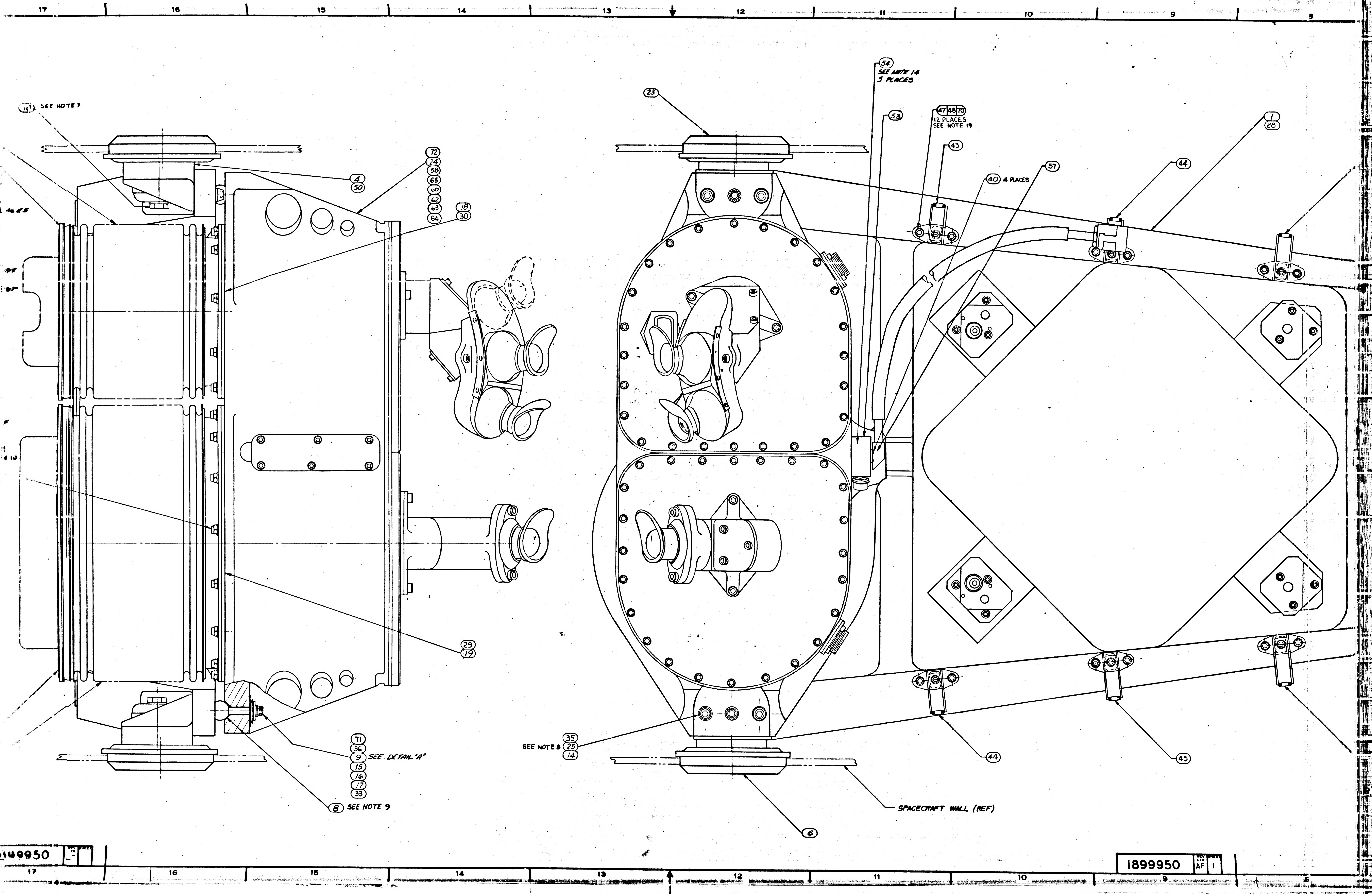
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT ASSEMBLY

SIZE J³ CODE IDENT NO. 80230 1899950
SCALE NONE SEE NOTE 18 SHEET 1 of 1

	REV LTR	SHEET
1899950	AF	1

E-2

17
16
15
14
13
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10
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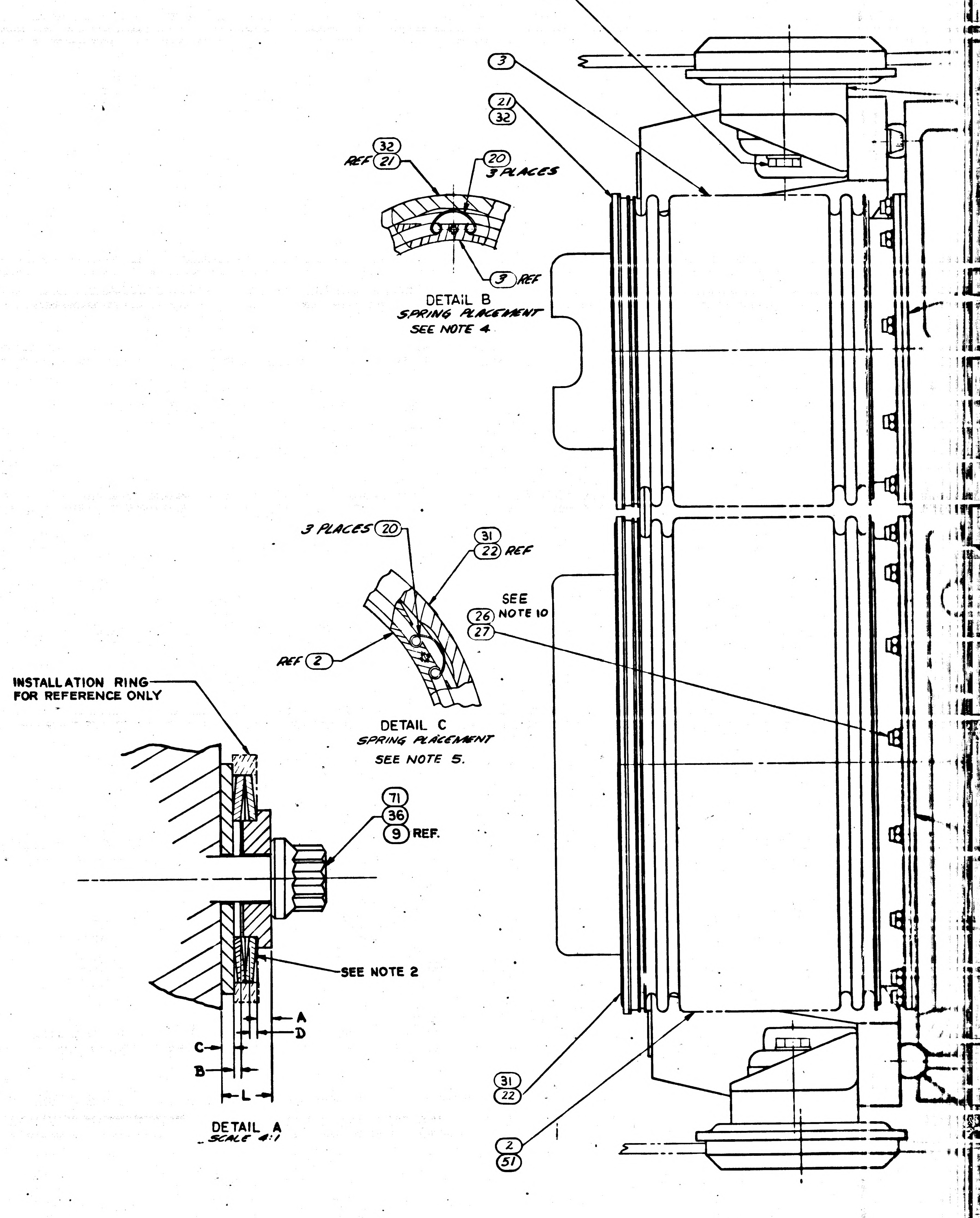
8
(10) SEE NOTE 7
(72)
(24)
(58)
(65)
(60)
(62)
(63)
(64)
(4)
(50)
(18)
(30)
(23)
(54) SEE NOTE 14
5 PLACES
(53)
(47)(48)(70)
12 PLACES
SEE NOTE 19
(43)
(40) 4 PLACES
(57)
(44)
(1)
(28)
(29)
(19)
(71)
(36)
(9) SEE DETAIL "A"
(15)
(16)
(17)
(33)
(8) SEE NOTE 9
SEE NOTE 8 (35)
(25)
(14)
(6)
SPACECRAFT WALL (REF)
(44)
(45)
99950
1899950
REV LTR
SHEET
AF
1

NOTES:

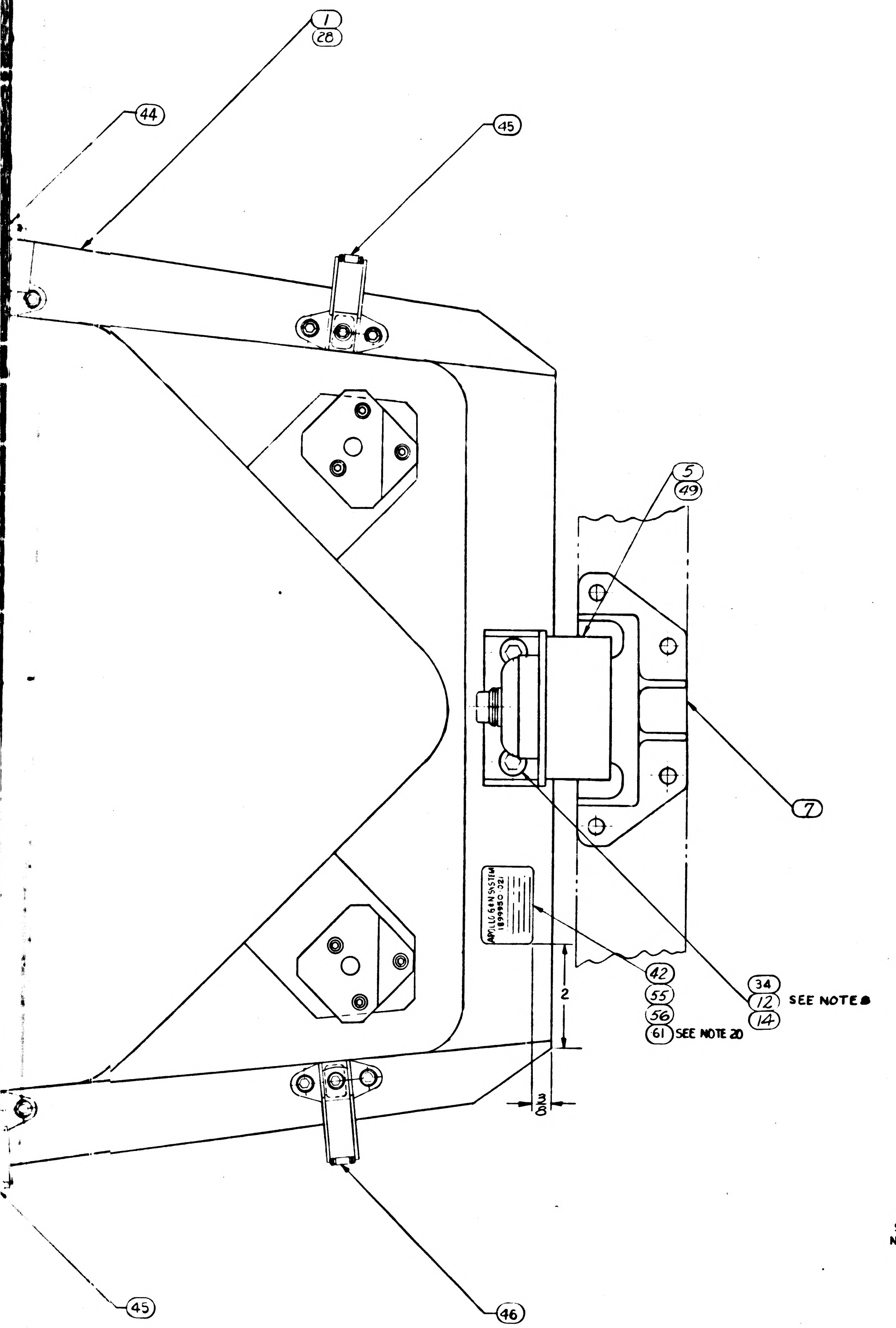
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. DETERMINE DIMENSIONS A, B, C, AND D. TIGHTEN ITEM 9, 36, OR 71 UNTIL L = (A + B + C + D + .008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31) AS SHOWN IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21, OR 32, 22 OR 31, 23 & 73 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ± 20 IN-LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ± 10 IN-LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9, 36 OR 71.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS 1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS- 6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN-LBS.
20. ADD PART DASH NUMBER PER ND 1002019.
21. SELECT CLAMPS AS REQUIRED TO CONFORM TO HARNESS CONFIGURATION.



(10) SEE NOTE 7
(3)
(21)
(32)
(32) REF (21)
(20) 3 PLACES
(3) REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
3 PLACES (20)
(31)
(22) REF
SEE
(26) NOTE 10
(27)
REF (2)
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
INSTALLATION RING
FOR REFERENCE ONLY
(71)
(36)
(9) REF.
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
(31)
(22)
(2)
(51)

1899950 | REV LTR AF | SHEET 1

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG NO	DATE	APPROVED
	AF	REPLACES REV AE WITH CHANGE PER TDRR 27396	—	11 MAR 66	
	AG	REVISED PER TDRR 27899		18 APR 66	RP



SEE NOTE 21 (items 66–69)

141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	2	2	2	2	2	2	2	2	2	2	2	2		73	1899994-011	FRONT ISOLATOR LOCKOUT PIN ASSY
				1										72	1011000-005	CPTICAL UNIT
3	3	3	3	3										71	1010728-3	BOLT EXT WRENCHING
12					12									70	NAS 135103-6	SCREW, SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					69	1010400-8	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					68	1010400-7	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					67	1010400-6	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					66	1010400-5	CLAMP, LOOP HINGED
		1							1					65	1011000-006	OPTICAL UNIT ASSY
	1						1							64	2011000-001	OPTICAL UNIT
1					1									63	2011000-021	OPTICAL UNIT
			1			1								62	2011000-011	OPTICAL UNIT
1	1	1	1	1	1	1	1	1						61	1014650-19	PLATE, IDENTIFICATION
								1						60	1011000-004	OPTICAL UNIT
									~~1~~					59	~~1011000-002~~	~~OPTICAL UNIT~~
										1				58	1011000-001	OPTICAL UNIT
QUANTITY REQUIRED														LIST OF PARTS AND MATERIALS		

141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1		/				1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
									1					56	1014650-18	PLATE, IDENTIFICATION
										1				55	1014650-17	PLATE, IDENTIFICATION
5	5		5		5	5	5		~~5~~					54	1011625-39	SCREW-SOCKET HEAD, CAP
1	1		1		1	1	1		~~1~~					53	1021407	ADAPTER PLATE ASSY COOL, HOSE BYP
							~~1~~		~~1~~					52	~~2011000~~	~~OPTICAL UNIT~~
1	1		1		1	1	1		~~1~~					51	1898952	BELLOWS ASSEMBLY SXT
2	2		2	2	2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1		1	1	1	1	1	1	~~1~~	~~1~~				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
	12	12	12	12		12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		45	1010400-3	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		44	1010400-2	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		43	1010400-1	CLAMP, LOOP HINGED
									~~1~~	~~1~~	1			42	1014650-9	PLATE, IDENTIFICATION
									~~4~~	~~4~~	~~4~~			41	~~1006997~~	~~WASHER, PLAIN FLAT~~
		4		4				4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
									~~1~~	~~1~~	~~1~~			39	~~1011500-16~~	~~PACKING, PREFORMED~~
									~~1~~	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~		37	~~1899999-011~~	~~ISOLATOR LOCKOUT SET (NAV. BASE)~~
					3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			31	1899997-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			30	1899996-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1			28	1899982	FRAME ASSY, NAV, BASE
24	24	24	24	24	24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
												4		25	MS20005-12	BOLT, INTERNAL WRENCHING
											1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP ASSY)
												1		22	1899954-002	SEAL, BELLOWS
												1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
												1		19	1899953-002	SEAL, BELLOWS
												1		18	1899953-001	SEAL, BELLOWS
												3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
														13		
												2		12	NAS145-11	BOLT-INTERNAL WRENCHING
														11		
3	3	3	3	3	3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
												3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP ASSY)
1	1	1	1	1	1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP ASSY)
		1							1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
		2							2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1		1				1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
												1		1	1899966	FRAME ASSY-NAVIGATION BASE
QUANTITY REQUIRED														LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT
INSTRUMENTATION LAB
Cambridge Mass
DRAWN F. KORACIN DATE 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
CONTRACT NAS9-497
NASA APPROVAL A. C. METZGER
MIT APPROVAL

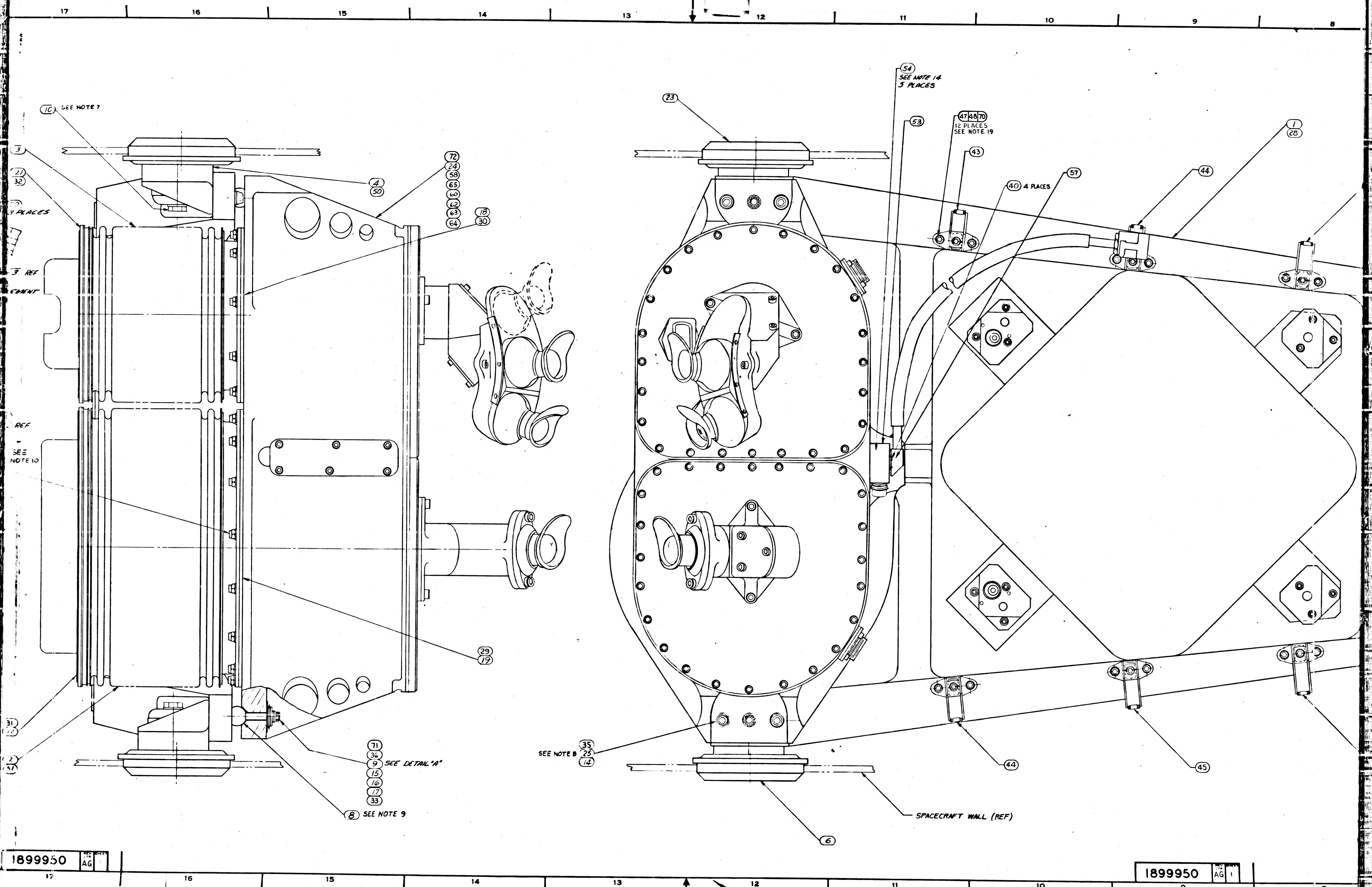
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT ASSEMBLY

SIZE J3 | CODE IDENT NO. 80230 | 1899950
SCALE NONE | SEE NOTE 18 | SHEET 1 of 1

1899950 | REV LTR AG | SHEET 1

3/1899950

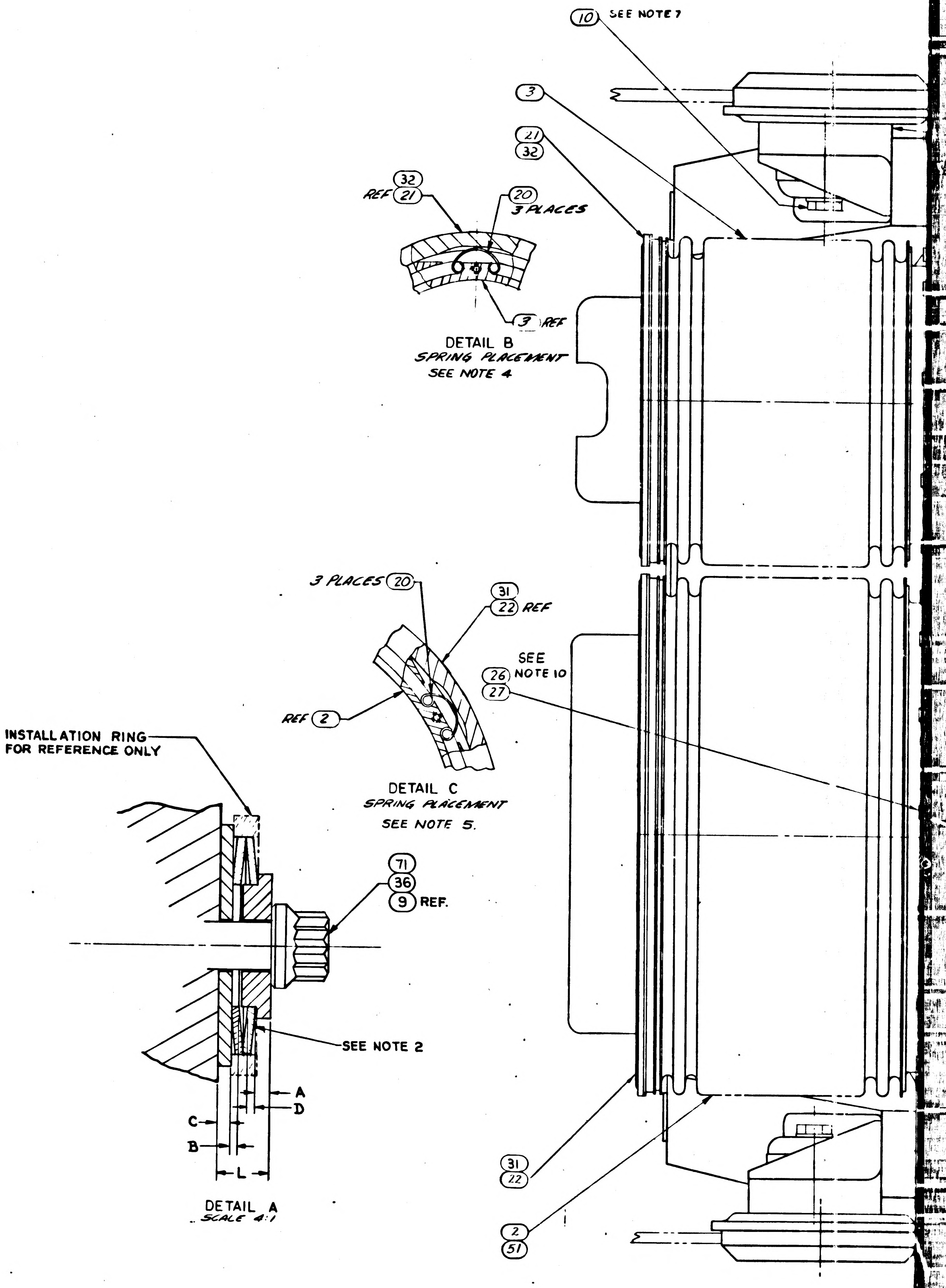

17
16
15
14
13
12
11
10
9
8
(10) SEE NOTE 7
(3)
(21) (32)
3 PLACES
3 REF
EMENT
REF
SEE NOTE 10
(4) (50)
(72) (24) (58) (65) (60) (62) (63) (64)
(18) (30)
(29) (19)
(31)
(71) (36) (9) SEE DETAIL "A" (15) (16) (17) (33)
(8) SEE NOTE 9
(23)
(54) SEE NOTE 14 5 PLACES
(53)
(47)(48)(70) 12 PLACES SEE NOTE 19
(43)
(40) 4 PLACES
(57)
(44)
(1) (28)
SEE NOTE 8 (35) (25) (14)
(44)
(45)
(6)
SPACECRAFT WALL (REF)

1899950 AG 1

1899950 AG 1

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. DETERMINE DIMENSIONS A, B, C, AND D. TIGHTEN ITEM 9, 36, OR 71 UNTIL L = (A + B + C + D + .008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31) AS SHOWN IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21, OR 32, 22 OR 31, 23 & 73 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ± 20 IN-LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ± 10 IN-LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9, 36 OR 71.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS 1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10^{-6} STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS- 6 OZ.
19. TORQUE ITEM 47 OR 70 TO 30 ± 2 IN. LBS.
20. ADD PART DASH NUMBER PER ND 1002019.
21. SELECT CLAMPS AS REQUIRED TO CONFORM TO HARNESS CONFIGURATION.



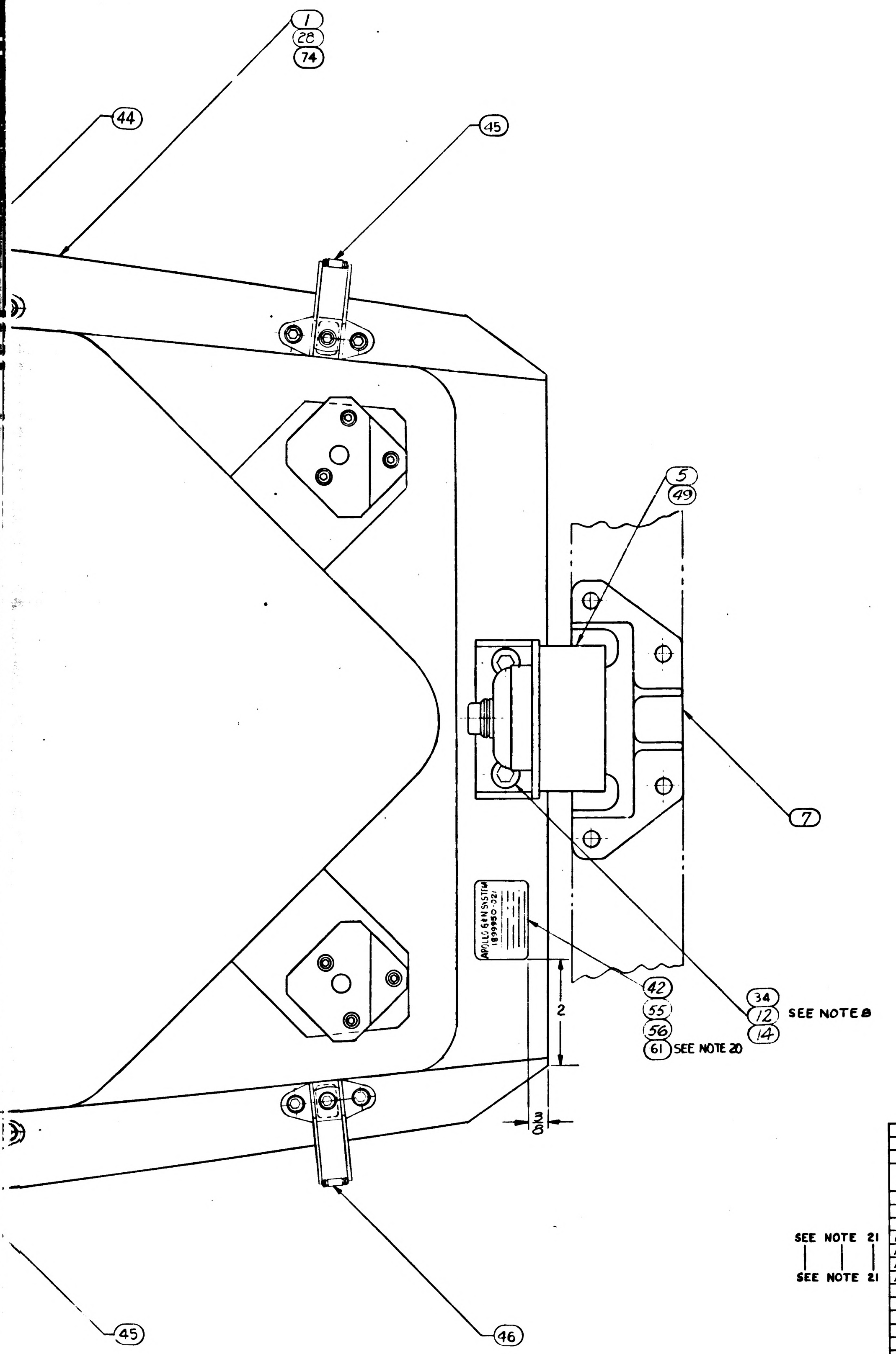
DETAIL B
SPRING PLACEMENT
SEE NOTE 4

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.

DETAIL A
SCALE 4:1

1899950 AG 1

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG NO.	DATE	APPROVED
	AF	REPLACES REV AE WITH CHANGE PER TDRR 27396	—	11 MAR 66	
	AG	REVISED PER TDRR 27899		18 APR 66	RP
	AH	REVISED PER TDRR 29508		14 JUN -66	J.



SEE NOTE 21 (items 69–66)

161	151	141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1															76	2011000-022	OPTICAL UNIT ASSY
1																75	1011000-007	OPTICAL UNIT ASSY
1	1		1			1										74	1899982-011	FRAME ASSY-NAV BASE
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		73	1899994-011	FRONT ISOLATOR LOCKOUT PIN ASSY
						1										72	1011000-005	OPTICAL UNIT
3	3	3	3	3	3	3										71	1010728-3	BOLT EXT WRENCHING
	12	12					12									70	NAS 1351C3-6	SCREW, SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					69	1010400-8	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					68	1010400-7	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					67	1010400-6	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					66	1010400-5	CLAMP, LOOP HINGED
				1							1					65	1011000-006	OPTICAL UNIT ASSY
			1						1							64	2011000-001	OPTICAL UNIT
		1					1									63	2011000-021	OPTICAL UNIT
					1			1								62	2011000-011	OPTICAL UNIT
1	1	1	1	1	1	1	1	1	1	1						61	1014650-19	PLATE, IDENTIFICATION
										1						60	1011000-004	OPTICAL UNIT
											~~1~~					59	~~1011000-002~~	~~OPTICAL UNIT~~
												1				58	1011000-001	OPTICAL UNIT

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SEE NOTE 21 (items 46–43)

161	151	141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1				1		1				1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
											1					56	1014650-18	PLATE, IDENTIFICATION
												1				55	1014650-17	PLATE, IDENTIFICATION
	5	5	5		5		5	5	5		~~5~~					54	1011625-39	SCREW-SOCKET HEAD, CAP
	1	1	1		1		1	1	1		~~1~~					53	1021407	ADAPTER PLATE ASSY COOL, HOSE BYP
									~~1~~		~~1~~					52	~~2011000~~	~~OPTICAL UNIT~~
	1	1	1		1		1	1	1		~~1~~					51	1898952	BELLOWS ASSEMBLY SXT
2	2	2	2		2	2	2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1	1	1		1	1	1	1	1	1	~~1~~	~~1~~				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
12			12	12	12	12		12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		45	1010400-3	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		44	1010400-2	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		43	1010400-1	CLAMP, LOOP HINGED
											~~1~~	~~1~~	1			42	1014650-9	PLATE, IDENTIFICATION
											~~4~~	~~4~~	~~4~~			41	~~1006897~~	~~WASHER, PLAIN FLAT~~
4				4		4				4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
											~~1~~	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
											~~1~~	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
		~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~		37	~~1899999-011~~	~~ISOLATOR LOCKOUT SET (NAV. BASE)~~
							3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4	4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2	2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1	1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1	1	1			31	1899997-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1	1	1			30	1899996-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
		1	~~1~~	1	1	~~1~~	1	1	1	1	1	1	1			28	1899982	FRAME ASSY, NAV, BASE
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
														4		25	MS20005-12	BOLT, INTERNAL WRENCHING
													1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP ASSY)
														1		22	1899954-002	SEAL, BELLOWS
														1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
														1		19	1899953-002	SEAL, BELLOWS
														1		18	1899953-001	SEAL, BELLOWS
														3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
																13		
														2		12	NAS145-11	BOLT-INTERNAL WRENCHING
																11		
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
														3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP ASSY)
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP ASSY)
				1							1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
				2							2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
1				1		1				1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
														1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DRAWN F. KORACIN DATE 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
CONTRACT NAS9-497
NASA APPROVAL A. C. METZGER
MIT APPROVAL

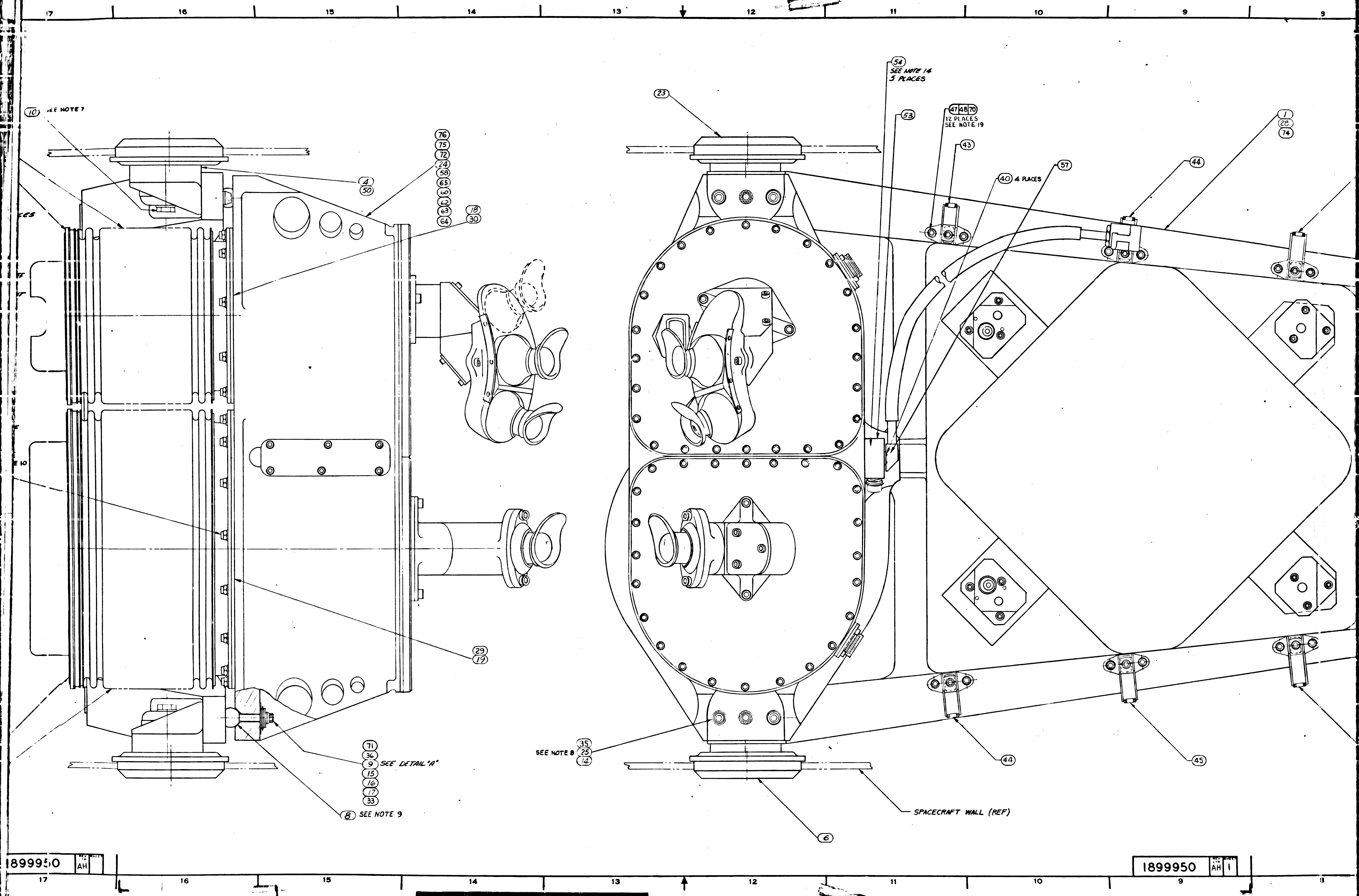
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT ASSEMBLY

SIZE J³ | CODE IDENT NO. 80230 | 1899950
SCALE NONE | SEE NOTE 18 | SHEET 1 of 1

1899950 | REV LTR AH | SHEET 1

3711899950


17
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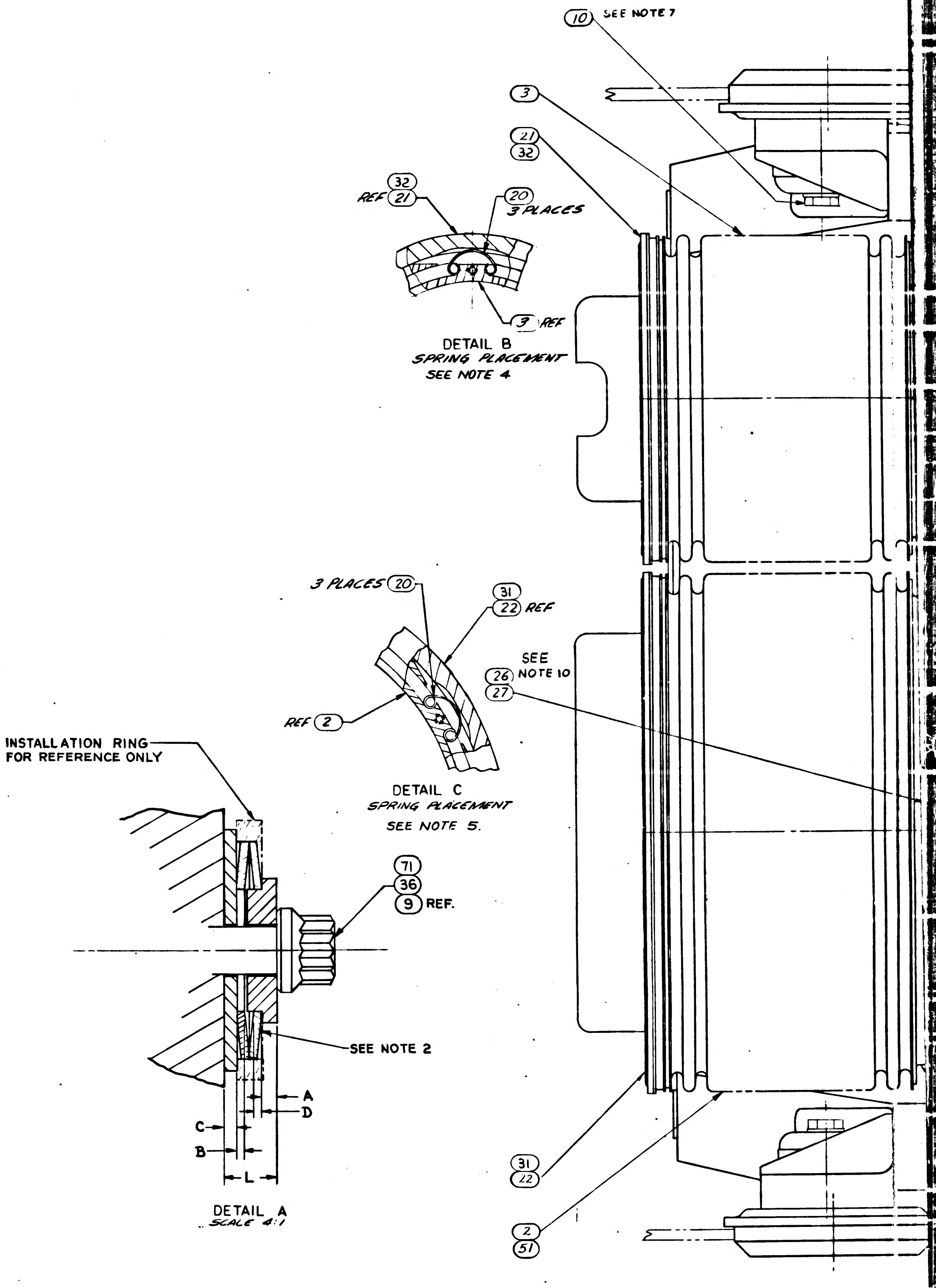
(10) SEE NOTE 7
CES
(76)
(75)
(72)
(24)
(58)
(65)
(60)
(62)
(63)
(64)
(4)
(50)
(18)
(30)
(23)
(54) SEE NOTE 14 5 PLACES
(53)
(47)(48)(70) 12 PLACES SEE NOTE 19
(43)
(40) 4 PLACES
(57)
(44)
(1)
(28)
(74)
E 10
(29)
(19)
(71)
(36)
(9) SEE DETAIL "A"
(15)
(16)
(17)
(33)
(8) SEE NOTE 9
SEE NOTE 8 (35)
(25)
(14)
(44)
(45)
(6)
SPACECRAFT WALL (REF)
1899950 AH
1899950 AH 1

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. DETERMINE DIMENSIONS A, B, C, AND D. TIGHTEN ITEM 9, 36, OR 71 UNTIL L = (A + B + C + D + .008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31) AS SHOWN IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21, OR 32, 22 OR 31, 23 & 73 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ± 20 IN-LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ± 10 IN-LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9, 36 OR 71.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS 1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10-6 STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS- 6 OZ.
19. TORQUE ITEM 47 OR 70 TO 30±2 IN. LBS.
20. ADD PART DASH NUMBER PER ND 1002019.
21. SELECT CLAMPS AS REQUIRED TO CONFORM TO HARNESS CONFIGURATION.



10 SEE NOTE 7
3
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REF 21
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3 PLACES
3 REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
3 PLACES 20
31
22 REF
SEE
26 NOTE 10
27
REF 2
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
INSTALLATION RING
FOR REFERENCE ONLY
71
36
9 REF.
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
31
22
2
51

1899950 AH

1/ 1899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. DETERMINE DIMENSIONS A, B, C, AND D. TIGHTEN ITEM 9, 36, OR 71 UNTIL L = (A + B + C + D + .008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31) AS SHOWN IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21, OR 32, 22 OR 31, 23 & 73 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ± 20 IN-LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ± 10 IN-LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9, 36 OR 71.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS 1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24,~~ 38 AND 39 ~~SHALL NOT EXCEED 10 x 10-6 STD CC/SEC OF HELIUM AT 77.5 ±~~ .5 PSIA, ~~WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS- 6 OZ.
19. TORQUE ITEM 47 OR 70 TO 30 ± 2 IN. LBS.
20. ADD PART DASH NUMBER PER ND 1002019.
21. SELECT CLAMPS AS REQUIRED TO CONFORM TO HARNESS CONFIGURATION.

	241	231	221	211	191	181	171	161	151	141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1																							83	1011000-010	OPTICAL UNIT ASSY
		1																						82	1011000-009	
			1																					81	1011000-008	
				1																				80	2011000-024	
					1																			79	2011000-023	
						1																		78	2011000-002	
							1																	77	2011000-012	
									1															76	2011000-022	
								1																75	1011000-007	OPTICAL UNIT ASS
	1	1	1	1		1		1	1		1			1										74	1899982-011	FRAME ASSY-N
	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		73	1899994-011	FRONT ISOLATO LOCKOUT PIN A
														1										72	1011000-005	OPTICAL UNIT
	3	3	3	3	3	3	3	3	3	3	3	3	3	3										71	1010728-3	BOLT EXT WRE
				12	12				12	12					12									70	NAS 1351C3-6	SCREW, SOCKET
SEE NOTE 21	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					69	1010400-8	CLAMP, LOOP H
	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					68	1010400-7	CLAMP, LOOP HI
	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					67	1010400-6	CLAMP, LOOP H
SEE NOTE 21	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					66	1010400-5	CLAMP, LOOP H
												1							1					65	1011000-006	OPTICAL UNIT AS
											1						1							64	2011000-001	OPTICAL UNIT
										1					1									63	2011000-021	OPTICAL UNIT
													1			1								62	2011000-011	OPTICAL UNIT
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						61	1014650-19	PLATE, IDENTIF
																		1						60	1011000-004	OPTICAL UNIT
																			~~1~~					59	~~1011000-002~~	~~OPTICAL UNIT~~
																				1				58	1011000-001	OPTICAL UNIT

QUANTITY REQUIRED

LIST OF PARTS AND MATER

1899950	REV LTR AJ	SHEET 1 of 2

1/1899950

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG NO.	DATE	APPROVED
	AJ	REPLACES REV AH WITH CHANGE PER TDRR 31218	—	28 SEP 66	EC

SEE NOTE 21

SEE NOTE 21

241	231	221	211	191	181	171	161	151	141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1	1	1					1				1		1				1	1	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
																		1					56	1014650-18	PLATE, IDENTIFICATION
																			1				55	1014650-17	PLATE, IDENTIFICATION
			5	5	5	5		5	5	5		5		5	5	5		~~5~~					54	1011625-39	SCREW-SOCKET HEAD, CAP
			1	1	1	1		1	1	1		1		1	1	1		~~1~~					53	1021407	ADAPTER PLATE ASSY COOL, HOSE BYP
																~~1~~		~~1~~					52	~~2011000~~	~~OPTICAL UNIT~~
			1	1	1	1		1	1	1		1		1	1	1		~~1~~					51	1898952	BELLOWS ASSEMBLY SXT
2	2		2	2	2	2	2	2	2	2		2	2	2	2	2	2	~~2~~	~~2~~				50	1010828	MOUNT, RESILIENT, FRONT
1	1		1	1	1	1	1	1	1	1		1	1	1	1	1	1	~~1~~	~~1~~				49	1C10827	MOUNT, RESILIENT, REAR
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12		48	MS16214-4	WASHER-LOCK
12	12	12			12	12	12			12	12	12	12		12	12	12	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		45	1010400-3	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	2	2	2		44	1010400-2	CLAMP, LOOP HINGED
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	1	1	1		43	1010400-1	CLAMP, LOOP HINGED
																		~~1~~	~~1~~	1			42	1014650-9	PLATE, IDENTIFICATION
																		~~1~~	~~1~~	~~1~~			41	~~1006827~~	~~WASHER, PLAIN FLAT~~
4	4	4		–	–	–	4				4		4				4	4	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
																		~~1~~	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
																		~~1~~	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
									~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~		37	~~1899999-011~~	~~ISOLATOR LOCKOUT SET (NAV. BASE)~~
														3	3	3	3	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			33	1899984	CENTERING COLLAR
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			31	1899997-002	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			30	1899996-001	SEAL, PLAIN ENCASED
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
		1	–	1		1			1	~~1~~	1	1	~~1~~	1	1	1	1	1	1	1			28	1899982	FRAME ASSY, NAV, BASE
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
																					4		25	MS20005-12	BOLT, INTERNAL WRENCHING
																				1	1		24	1011000-000	OPTICAL UNIT
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP ASSY)
																					1		22	1899954-002	SEAL, BELLOWS
																					1		21	1899954-001	SEAL, BELLOWS
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
																					1		19	1899953-002	SEAL, BELLOWS
																					1		18	1899953-001	SEAL, BELLOWS
																					3		17	1899976	COLLAR, CENTERING
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		15	1899977	WASHER
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		14	AN960C-516L	WASHER, FLAT
																							13		
																					2		12	NAS145-11	BOLT-INTERNAL WRENCHING
																							11		
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		10	1899980	BOLT-HEX HEAD
																					3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP ASSY)
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP ASSY)
		1									1							1	1	1	1		5	1899969	MOUNT, RESILIENT, REAR
		2									2							2	2	2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
1	1	1		–	–		1				1		1				1	1	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
																					1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

61	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
							83	1011000-010	OPTICAL UNIT ASSY
							82	1011000-009	
							81	1011000-008	
							80	2011000-024	
							79	2011000-023	
							78	2011000-002	
							77	2011000-012	
							76	2011000-022	
							75	1011000-007	OPTICAL UNIT ASSY
							74	1899982-011	FRAME ASSY-NAV BASE
2	2	2	2		2		73	1899994-011	FRONT ISOLATOR LOCKOUT PIN ASSY
							72	1011000-005	OPTICAL UNIT
							71	1010728-3	BOLT EXT WRENCHING
							70	NAS 1351C3-6	SCREW, SOCKET HD CAP
AR	AR	AR					69	1010400-8	CLAMP, LOOP HINGED
AR	AR	AR					68	1010400-7	CLAMP, LOOP HINGED
AR	AR	AR					67	1010400-6	CLAMP, LOOP HINGED
AR	AR	AR					66	1010400-5	CLAMP, LOOP HINGED
		1					65	1011000-006	OPTICAL UNIT ASSY
1							64	2011000-001	OPTICAL UNIT
							63	2011000-021	OPTICAL UNIT
							62	2011000-011	OPTICAL UNIT
1	1						61	1014650-19	PLATE, IDENTIFICATION
	1						60	1011000-004	OPTICAL UNIT
		~~1~~					59	~~1011000-002~~	~~OPTICAL UNIT~~
			1				58	1011000-001	OPTICAL UNIT

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS

F. KORACIN 11 APR 63
DRAWN DATE
MALIKOWSKI 12 APR 63
CHECKED
J. HANN 12 APR 63
APPROVAL
CONTRACT NAS9-497
A.C. METZGER
NASA APPROVAL
W. KUFFER 22 MAR 66
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT ASSEMBLY

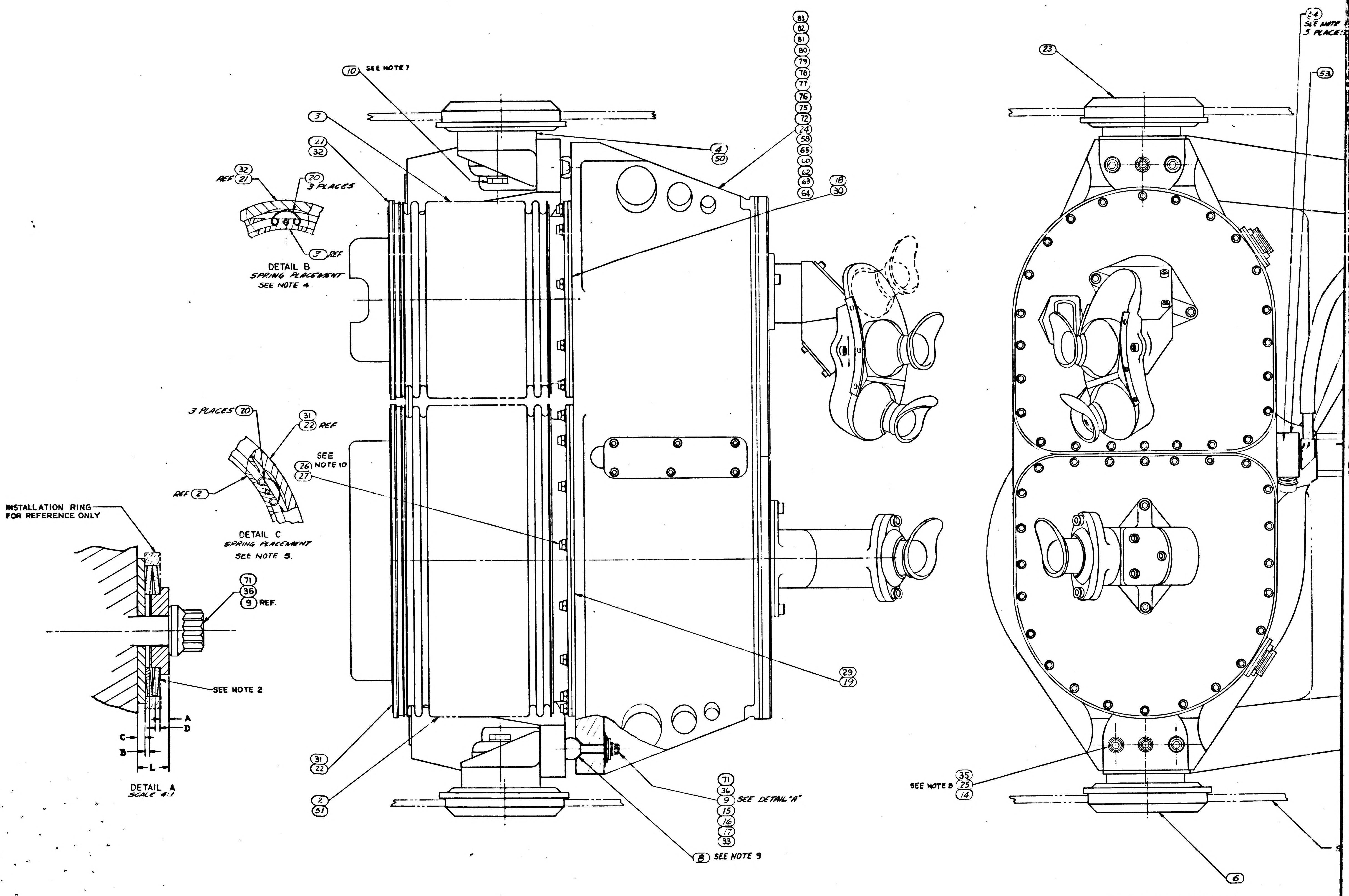
SIZE J
CODE IDENT NO. 80230
1899950
SCALE NONE
SEE NOTE 18
SHEET 1 of 2

1899950

1899950

1899950	REV LTR AJ	SHEET 1 of 2

2/1899950



10 SEE NOTE 7
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24 SEE NOTE 3 PLACES
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REF 21
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3 PLACES
3 REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
3 PLACES 20
31
22 REF
REF 2
SEE NOTE 10
26
27
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
INSTALLATION RING FOR REFERENCE ONLY
71
36
9 REF.
SEE NOTE 2
A
D
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DETAIL A
SCALE 4:1
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9 SEE DETAIL "A"
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8 SEE NOTE 9
SEE NOTE 8 35
25
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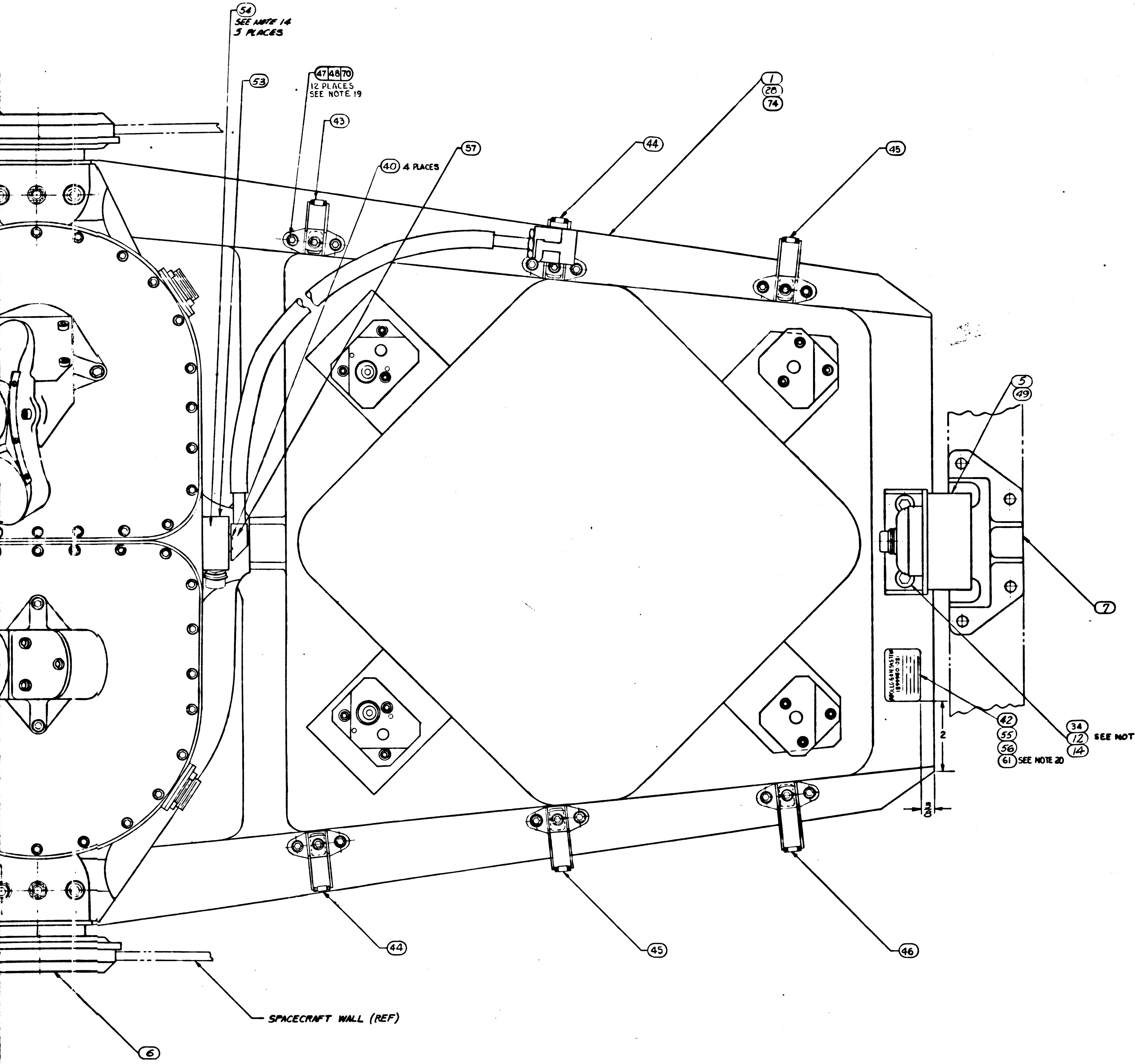
1899950 AJ 2 OF 2

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPROVED
	AJ	REPLACES REV AH WITH CHANGE PER TDRR 31218		28 SEP 66	EC



54
SEE NOTE 14
3 PLACES
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47 48 70
12 PLACES
SEE NOTE 19
43
40 4 PLACES
57
44
1
28
74
45
5
49
7
42
55
56
61 SEE NOTE 20
34
12 SEE NOTE 8
14
2
44
45
46
SPACECRAFT WALL (REF)
6

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±	MIT INSTRUMENTATION LAB CAMBRIDGE MASS	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN DATE 31 AUG '66 CHECKED APPROVAL CONTRACT NAS9-497	NAVIGATION BASE AND OPTICAL UNIT ASSY
MATERIAL	A.C. METZGER NASA APPROVAL W. KUPFER MIT APPROVAL	SIZE J2 · CODE IDENT NO. 80230 · 1899950
APPROVAL		SCALE · SHEET 2 OF 2

1899950 AJ

2/41899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. DETERMINE DIMENSIONS A, B, C, AND D. TIGHTEN ITEM 9, 36, OR 71 UNTIL L = (A + B + C + D + .008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31) AS SHOWN IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21, OR 32, 22 OR 31, 23 & 73 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ± 20 IN-LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ± 10 IN-LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9, 36 OR 71.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS 1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10^{-6} STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS- 6 OZ.
19. TORQUE ITEM 47 OR 70 TO 30 ± 2 IN. LBS.
20. ADD PART DASH NUMBER PER ND 1002019.
21. SELECT CLAMPS AS REQUIRED TO CONFORM TO HARNESS CONFIGURATION.
22. REMOVE SEXTANT COVER AND FLANGE ASS'Y AND SEXTANT CLAMP PRIOR TO ASSEMBLY OF ITEMS 2 AND 51 TO THE OPTICAL UNIT. REINSTALL THE ITEMS REMOVED AFTER BELLOWS ASSEMBLY IS COMPLETED.

REFERENCE INFORMATION

SYSTEM NO.	PRE-MOD P/N	POST MOD. P/N
17	1899950-051	1899950-251
20	1899950-221	1899950-261
12	1899950-231	1899950 271
121A	1899950-211	1899950 -291
122	1899950-211	1899950-321
123	1899950-191	1899950-311

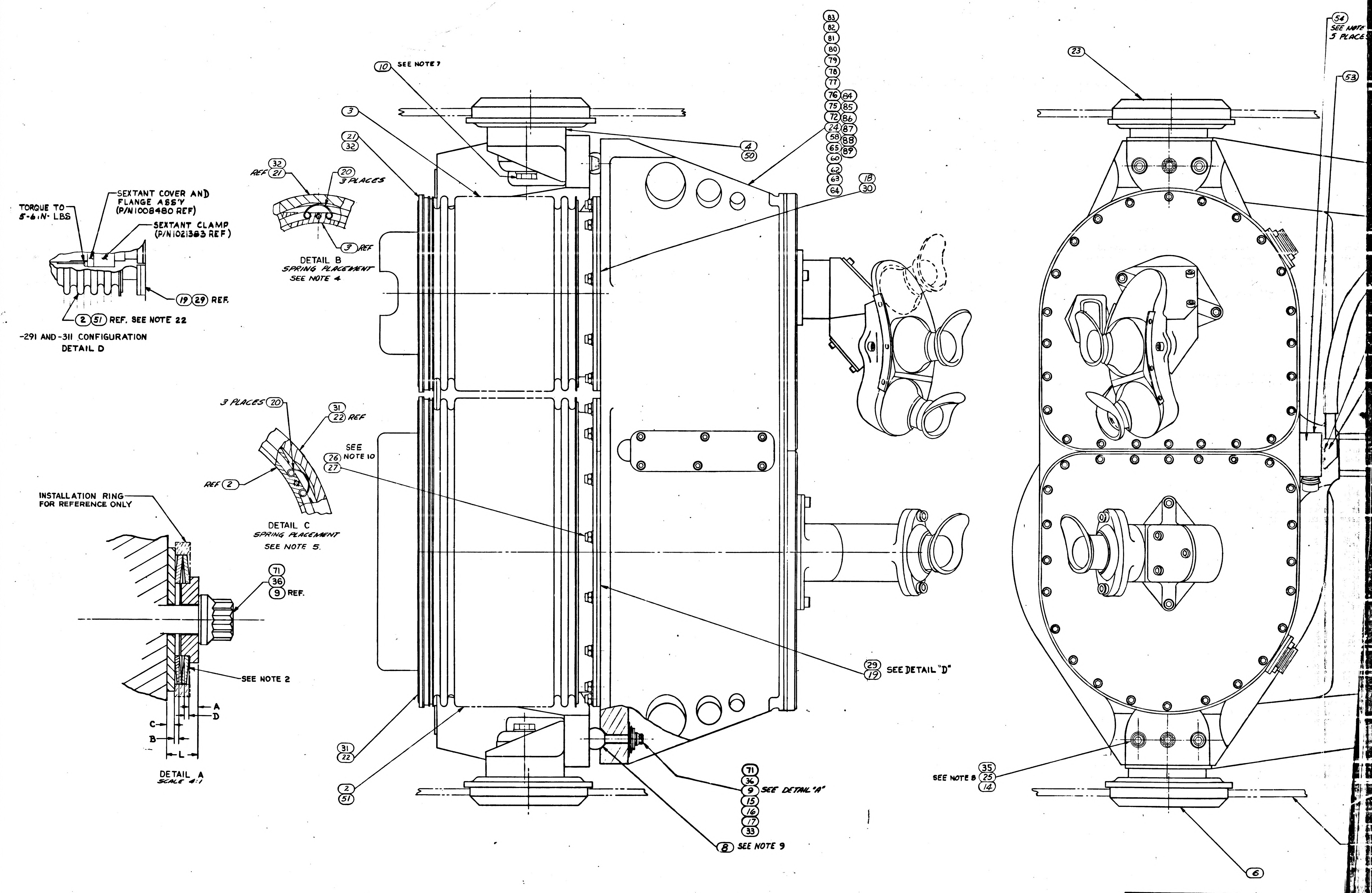
	321	311	291	281	271	261	251	241	231	221	211	191	181	171	161	151	141	131	121	111	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1																													89	102/368-061	OPTICAL UNIT AS
	1																														88	102/368-051	
			1																												87	102/368-041	
						1																									86	102/368-031	
					1																										85	102/368-021	
							1																								84	102/368-011	OPTICAL UNIT A
								1																							83	1011000-010	OPTICAL UNIT ASSY
									1																						82	1011000-009	
										1																					81	1011000-008	
											1																				80	2011000-024	
												1																			79	2011000-023	
													1																		78	2011000-002	
														1																	77	2011000-012	
																1															76	2011000-022	
															1																75	1011000-007	OPTICAL UNIT ASSY
	1		1		1			1	1	1	1		1		1	1		1			1										74	1899982-011	FRAME ASSY-NAV
	2	2	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		73	1899994-011	FRONT ISOLATOR LOCKOUT PIN AS
																					1										72	1011000-005	OPTICAL UNIT
	3	3	3		3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3										71	1010728-3	BOLT EXT WRE
											12	12				12	12					12									70	NAS 1351C3-6	SCREW, SOCKET
SEE NOTE 21	AR	AR	AR		AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					69	1010400-8	CLAMP, LOOP HIN
	AR	AR	AR		AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					68	1010400-7	CLAMP, LOOP HIN
	AR	AR	AR		AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					67	1010400-6	CLAMP, LOOP HIN
SEE NOTE 21	AR	AR	AR		AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR					66	1010400-5	CLAMP, LOOP HIN
																			1							1					65	1011000-006	OPTICAL UNIT ASSY
																		1						1							64	2011000-001	OPTICAL UNIT
																	1					1									63	2011000-021	OPTICAL UNIT
																				1			1								62	2011000-011	OPTICAL UNIT
	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						61	1014650-19	PLATE, IDENTIFICA
																									1						60	1011000-004	OPTICAL UNIT
																										~~1~~					59	~~1011000-00[illegible]~~	~~OPTICAL UNIT~~
																											1				58	1011000-001	OPTICAL UNIT

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

1899950 REV LTR AK SHEET 1 OF 2

17/1899950


TORQUE TO 5-6 IN-LBS
SEXTANT COVER AND FLANGE ASS'Y (P/N1008480 REF)
SEXTANT CLAMP (P/N1021383 REF)
(19) (29) REF.
(2) (51) REF. SEE NOTE 22
-291 AND -311 CONFIGURATION
DETAIL D
REF (32) (21)
(20) 3 PLACES
(3) REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
(10) SEE NOTE 7
(3)
(21) (32)
(4) (50)
(83) (82) (81) (80) (79) (78) (77) (76) (75) (72) (24) (58) (65) (60) (62) (63) (64)
(84) (85) (86) (87) (88) (89)
(18) (30)
3 PLACES (20)
(31) (22) REF
REF (2)
SEE NOTE 10
(26) (27)
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
INSTALLATION RING FOR REFERENCE ONLY
(71) (36) (9) REF.
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
(31) (22)
(2) (51)
(29) (19) SEE DETAIL "D"
(71) (36) (9) SEE DETAIL "A" (15) (16) (17) (33)
(8) SEE NOTE 9
(23)
(54) SEE NOTE 5 PLACES
(53)
SEE NOTE 8 (35) (25) (14)
(6)

1899950 AK 2 OF 2

1/1899950

APOLLO G&N Specification
PS 1899950 A
Original Issue Date: 7-1-64
Release Authority: TDRR 10791
Class A Release

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA
11-4-64	A	14023	2	WK	WJR

This specification consists of page i and 1 to 3 inclusive.

APPROVALS	7/1 NASA/MSC	July 64	7/1/64 MIT/IL	ACSP

3. REQUIREMENTS

3.1 GENERAL SPECIFICATION. All of the requirements of Specification ND1002210 with the exception of the workmanship vibration requirement shall apply as requirements of this specification.

3.2 DESCRIPTION. The assembly consists of a Navigation Base Frame Assembly, Optical Unit Assembly, Bellows, Seals, Resilient Mounts, and mounting hardware.

3.3 FUNCTIONAL REQUIREMENTS

3.3.1 Electrical Inputs. The following electrical inputs are required to test the assembly.

a. 28 +2, -3 vdc, 95 watts
b. 115±11.5 vac, 400 cps, 30 watts

3.3.2 Optics Assembly to IMU Mounting Pad Alignment. With the Optics Subsystem in the ZERO OPTICS mode and subsequently set to the MANUAL mode, the 2X trunnion and shaft CDU 16X resolver error outputs shall be less than 4 mv rms in phase and the SXT St LOS shall be aligned to the planes formed by the IMU mounting pads and alignment pins as follows:

a. The SXT St LOS shall be parallel to the Y_{NB} Z_{NB} plane within 26 arc seconds at any given shaft angle.

b. The SXT St LOS, at $A_S = 0°$, shall be parallel to the X_{NB} Z_{NB} plane to within 21 arc seconds at any useful trunnion angle.

3.4 PERFORMANCE AND PRODUCT CHARACTERISTICS

3.4.1 Service Life

3.4.1.1 Operating Life. The assembly shall meet performance specifications for at least 2000 hours of operation, excluding the supplier's test time of the completed unit.

3.4.1.2 Shelf Life. The assembly shall have a shelf life of at least 3 years, without operation, at ambient room temperature after final acceptance at the supplier's facility when packaged in accordance with Specification ND1002214.

3.4.2 Reliability. Design objectives require maximum reliability of the assembly during its period of useful life. Every effort shall be made to design and produce units capable of meeting a maximum failure rate of 85 failures per million hours.

B 1899950

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		UPGRADED FOR CLASS A RELEASE TDRR 01076		27 APR. 63	A.J.F / W.K.

PICTURE INCOMPLETE

DRAWINGS FOR REFERENCE:
1899956 FAMILY TREE

00916
17 APR 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1			1899954-002	SEAL, BELLOWS
			1			1899954-001	SEAL, BELLOWS
			6			1899971	SPRING, SEAL, RETAINER
			6			AN-960C-516L	WASHER, FLAT
			24			AN-960C-10L	WASHER, FLAT
			3			1899980	BOLT
			2			MS-21250-05006	BOLT, 12 POINT EXT WRENCHING
			3			MS-21250-04028	BOLT, 12 POINT EXT WRENCHING
			24			AN 363C-1032	NUT, SELF LOCKING
			4			MS-20005-16	BOLT, INTERNAL WRENCHING
			3			1899979	WASHER, SPRING
			1			1011000	OPTICS SUBSYSTEM ASSEMBLY
			1			1899978	SNUBBER, FRONT RH
			3			1899977	WASHER, FLAT SPECIAL
			3			1899976	COLLAR, CENTERING
			1			1899975	SNUBBER, REAR
			1			1899974	SNUBBER, FRONT LH
			1			1899952	BELLOWS & SEAL ASSY, SXT
			1			1899951	BELLOWS & SEAL ASSY, SCT
			2			1899970	MOUNT, RESILIENT, FRONT
			1			1899969	MOUNT, RESILIENT, REAR
			3			1899967	BALL, PRECISION
			1			1899966	FRAME ASSY, NAV BASE
			1			1899953-002	SEAL, BELLOWS
			1			1899953-001	SEAL, BELLOWS

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F Koracin DATE 11 APR 63
CHECKED 12 APR 63
APPROVAL J. Hom 12 APR 63
APPROVAL Riedel 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE &
OPTICS SUBSYSTEM ASSEMBLY

CODE IDENT NO.
SIZE D
1899950
SCALE —
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS 1899950 B
Original Issue Date: 7-1-64
Release Authority: TDRR 10791
Class A Release

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA
(M) 11-4-64	A	14023	2 [illegible]	WK	WJR
2/9/65	B	16382	2 [illegible]	WK	TM

This specification consists of page i
and 1 to 3 inclusive.

APPROVALS	NASA/MSC	July 64	7/1/64 MIT/IL	R E Leitz	ACSP

3. REQUIREMENTS

3.1 GENERAL SPECIFICATION. All of the requirements of Specification ND1002210 with the exception of the workmanship vibration requirement shall apply as requirements of this specification.

3.2 DESCRIPTION. The assembly consists of a Navigation Base Frame Assembly, Optical Unit Assembly, Bellows, Seals, Resilient Mounts, and mounting hardware.

3.3 FUNCTIONAL REQUIREMENTS

3.3.1 Electrical Inputs. The following electrical inputs are required to test the assembly.

a. 28 +2, -3 vdc, 95 watts
b. 115±11.5 vac, 400 cps, 30 watts

3.3.2 Optical Unit to IMU Mounting Pad Alignment. With the Optical Subsystem set to the ZERO OPTICS mode, and subsequently set to the MANUAL mode, the 2X TRUNNION CDU and SHAFT ANGLE CDU 16X Resolver error signals shall be less than 4 mv rms in phase and the SXT lines of sight shall be aligned to the axes defined by the IMU mounting pads and alignment pins as follows:

3.3.2.1 With the shaft and trunnion angles at zero:

a. The SXT St Los shall be parallel to the Z_{nb} axis within 36 arc seconds measured about the X_{nb} axis and 30 arc seconds measured about the Y_{nb} axis.

b. The SXT L LOS shall be parallel to the Z_{nb} axis within 30 arc seconds measured about the X_{nb} and Y_{nb} axes.

3.3.2.2 With the shaft angle at zero, and the trunnion angle at 57° LOS, the SXT S_t LOS shall be perpendicular to the Y_{nb} axis within 38 arc seconds.

3.4 PERFORMANCE AND PRODUCT CHARACTERISTICS

3.4.1 Service Life

3.4.1.1 Operating Life. The assembly shall meet performance specifications for at least 2000 hours of operation, excluding the supplier's test time of the completed unit.

3.4.1.2 Shelf Life. The assembly shall have a shelf life of at least 3 years, without operation, at ambient room temperature after final acceptance at the supplier's facility when packaged in accordance with Specification ND1002214.

3.4.2 Reliability. Design objectives require maximum reliability of the assembly during its period of useful life. Every effort shall be made to design and produce units capable of meeting a maximum failure rate of 85 failures per million hours.

1899950 B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ B		UPGRADED FOR CLASS A RELEASE TDRR01076		27-APR.-63	A.J.F. / WK
C		REVISE IN ACCORDANCE WITH TDRR 01594		17 July 63	WR

PICTURE INCOMPLETE

DRAWINGS FOR REFERENCE:
1899956 FAMILY TREE

00916
17 APR 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		021	011				
		1				1899982	FRAME ASS'Y, NAV. BASE
		1	1			1899954-002	SEAL, BELLOWS
		1	1			1899954-001	SEAL, BELLOWS
		6	6			1899971	SPRING, SEAL, RETAINER
		6	6			AN-960C-516L	WASHER, FLAT
		24	24			AN-960C-10L	WASHER, FLAT
		3	3			1899980	BOLT
		2	2			MS-21250-05006	BOLT, 12 POINT EXT WRENCHING
		3	3			MS-21250-04028	BOLT, 12 POINT EXT WRENCHING
		24	24			AN 363C-1032	NUT, SELF LOCKING
		4	4			MS-20005-16	BOLT, INTERNAL WRENCHING
		3	3			1899979	WASHER, SPRING
		1	1			1011000	OPTICS SUBSYSTEM ASSEMBLY
		1	1			1899978	SNUBBER, FRONT RH
		3	3			1899977	WASHER, FLAT SPECIAL
		3	3			1899976	COLLAR, CENTERING
		1	1			1899975	SNUBBER, REAR
		1	1			1899974	SNUBBER, FRONT LH
		1	1			1899952	BELLOWS & SEAL ASSY, SXT
		1	1			1899951	BELLOWS & SEAL ASSY, SCT
		2	2			1899970	MOUNT, RESILIENT, FRONT
		1	1			1899969	MOUNT, RESILIENT, REAR
		3	3			1899967	BALL, PRECISION
			1			1899966	FRAME ASSY, NAV BASE
		1	1			1899953-002	SEAL, BELLOWS
		1	1			1899953-001	SEAL, BELLOWS

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+—	+—	+—
——	——	——

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN F Koracin DATE 11 APR 63
CHECKED 12 APR 63
APPROVAL J. Horn 12 APR 63
APPROVAL 12 APR 63
NASA APPROVAL
R. Gross
MIT APPROVAL 17 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE &
OPTICS SUBSYSTEM ASSEMBLY

CODE IDENT NO.
SIZE D
1899950
SCALE —
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS 1899950 C
Original Issue Date: 7-1-64
Release Authority: TDRR 10791
Class A Release

PROCUREMENT SPECIFICATION
FOR
NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA
11-4-64	A	14023	2	WK	WJR
2/9/65	B	16382	2	WK	TM
8-17-65	C	21611	1	WK	TM

This specification consists of page i and 1 to 3 inclusive.

APPROVALS	NASA/MSC	July 64	MIT/IL		ACSP

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Navigation Base and Optical Unit Assembly, Drawing 1899950, hereafter called the assembly.

1.2 CLASSIFICATION. The requirements for the equipment covered by this specification shall be classified as follows. Unless identified by the respective type, all requirements of this specification are applicable for all types.

a. Type I: The requirements for Part Number 1899950-011 shall be designated as Type I in this specification.

b. Type II: The requirements for Part Number 1899950-021 shall be designated as Type II in this specification.

c. Type III: The requirements for Part Number 1899950-031 shall be designated as Type III in this specification.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of this specification form a part of this specification to the extent specified herein.

SPECIFICATIONS

APOLLO G&N

ND1002210	General Specification for Procurement of APOLLO Guidance and Navigation Assemblies and Subassemblies
ND1002214	General Specification for Preservation, Packaging, Packing and Container Marking of Apollo Guidance and Navigation Major Assemblies, Assemblies, Subassemblies and Parts
FTM1899950	Final Test Method for Navigation Base and Optical Unit Assembly

DRAWINGS

APOLLO G&N

1899950	Navigation Base and Optical Unit Assembly

B 1899950

	SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ	B		UPGRADED FOR CLASS A RELEASE TDRR 01076		27-APR-63	A.J.F. / wk
Ⓜ	C		REVISE IN ACCORDANCE WITH TDRR 01594		19 July 63	wk
	D		Replaced by Rev E with changes TDRR 02307		31 July 63	wk

PICTURE INCOMPLETE

DRAWINGS FOR REFERENCE:
1899956 FAMILY TREE

00916
17 APR 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		021	011				
		1				1899982	FRAME ASS'Y, NAV. BASE
		1	1			1899954-002	SEAL, BELLOWS
		1	1			1899954-001	SEAL, BELLOWS
		6	6			1899971	SPRING, SEAL, RETAINER
		6	6			AN-960C-516L	WASHER, FLAT
		24	24			AN-960C-10L	WASHER, FLAT
		3	3			1899980	BOLT
		2	2			MS-21250-05006	BOLT, 12 POINT EXT WRENCHING
		3	3			MS-21250-04028	BOLT, 12 POINT EXT WRENCHING
		24	24			AN 363C-1032	NUT, SELF LOCKING
		4	4			MS-20005-16	BOLT, INTERNAL WRENCHING
		3	3			1899979	WASHER, SPRING
		1	1			1011000	OPTICS SUBSYSTEM ASSEMBLY
		1	1			1899978	SNUBBER, FRONT RH
		3	3			1899977	WASHER, FLAT SPECIAL
		3	3			1899976	COLLAR, CENTERING
		1	1			1899975	SNUBBER, REAR
		1	1			1899974	SNUBBER, FRONT LH
		1	1			1899952	BELLOWS & SEAL ASSY, SXT
		1	1			1899951	BELLOWS & SEAL ASSY, SCT
		2	2			1899970	MOUNT, RESILIENT, FRONT
		1	1			1899969	MOUNT, RESILIENT, REAR
		3	3			1899967	BALL, PRECISION
			1			1899966	FRAME ASSY, NAV BASE
		1	1			1899953-002	SEAL, BELLOWS
		1	1			1899953-001	SEAL, BELLOWS

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +— —— DECIMALS +— —— ANGLES +— ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F Koracin DATE 11 APR 63
CHECKED 12 APR 63
APPROVAL 12 APR 63
APPROVAL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE & OPTICS SUBSYSTEM ASSEMBLY

CODE IDENT NO. SIZE D 1899950
SCALE — SHEET

INCHES 0 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS 1899950 D
Original Issue Date: 7 - 1 - 64
Release Authority: TDRR 10791
Class A Release

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA
11-4-64	A	14023	2	WK	WJR
2/9/65	B	16382	2	WK	TM
8-17-65	C	21611	1	WK	TM
11/23/65	D	24301	1-3. Now 4 pages was 3 pages.	WK	--

This specification consists of page i
and 1 to 4 inclusive.

APPROVALS	NASA/MSC	July 64	MIT/IL	R E Lutz	ACSP

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Navigation Base and Optical Unit Assembly, Drawing 1899950, hereafter called the assembly.

1.2 CLASSIFICATION. The requirements for the equipment covered by this specification shall be classified as follows. Unless identified by the respective type, all requirements of this specification are applicable for all types.

a. Type I: The requirements for Part Number 1899950-011 shall be designated as Type I in this specification.

b. Type II: The requirements for Part Number 1899950-021 shall be designated as Type II in this specification.

c. Type III: The requirements for Part Number 1899950-031 shall be designated as Type III in this specification.

d. Type IV: The requirements for Part Number 1899950-041 shall be designated as Type IV in this specification.

e. Type V: The requirements for Part Number 1899950-051 shall be designated as Type V in this specification.

f. Type VI: The requirements for Part Number 1899950-061 shall be designated as Type VI in this specification.

g. Type VII: The requirements for Part Number 1899950-071 shall be designated as Type VII in this specification.

h. Type VIII: The requirements for Part Number 1899950-081 shall be designated as Type VIII in this specification.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of this specification form a part of this specification to the extent specified herein.

SPECIFICATIONS

APOLLO G&N

ND1002210	General Specification for Procurement of APOLLO Guidance and Navigation Assemblies and Subassemblies
ND1002214	General Specification for Preservation, Packaging, Packing and Container Marking of APOLLO Guidance and Navigation Major Assemblies, Assemblies, Subassemblies and Parts
FTM1899950	Final Test Method for Navigation Base and Optical Unit Assembly

DRAWINGS

APOLLO G&N

1899950	Navigation Base and Optical Unit Assembly

3. REQUIREMENTS

3.1 GENERAL SPECIFICATION. All of the requirements of Specification ND1002210 with the exception of the workmanship vibration requirement shall apply as requirements of this specification.

3.2 DESCRIPTION. The assembly consists of a Navigation Base Frame Assembly, Optical Unit Assembly, Bellows, Seals, Resilient Mounts, and mounting hardware.

3.3 FUNCTIONAL REQUIREMENTS

3.3.1 Electrical Inputs. The following electrical inputs are required to test the assembly.

a. 28 +2, -3 vdc, 95 watts
b. 115±11.5 vac, 400 cps, 30 watts

3.3.2 Optical Unit to IMU Mounting Pad Alignment. With the Optical Subsystem set to the ZERO OPTICS mode, and subsequently set to the MANUAL mode, the 2X TRUNNION CDU and SHAFT ANGLE CDU 16X Resolver error signals shall be less than 4 mv rms in phase and the SXT lines of sight shall be aligned to the axes defined by the IMU mounting pads and alignment pins as follows:

3.3.2.1 With the shaft and trunnion angles at zero:

a. The SXT St Los shall be parallel to the Z_{nb} axis within 36 arc seconds measured about the X_{nb} axis and 30 arc seconds measured about the Y_{nb} axis.

b. The SXT L LOS shall be parallel to the Z_{nb} axis within 30 arc seconds measured about the X_{nb} and Y_{nb} axes.

3.3.2.2 With the shaft angle at zero, and the trunnion angle at 57° LOS, the SXT S_t LOS shall be perpendicular to the Y_{nb} axis within 38 arc seconds.

3.4 PERFORMANCE AND PRODUCT CHARACTERISTICS

3.4.1 Service Life

3.4.1.1 Operating Life. The assembly shall meet performance specifications for at least 2000 hours of operation, excluding the supplier's test time of the completed unit.

3.4.1.2 Shelf Life. The assembly shall have a shelf life of at least 3 years, without operation, at ambient room temperature after final acceptance at the supplier's facility when packaged in accordance with Specification ND1002214.

3.4.2 Reliability. Design objectives require maximum reliability of the assembly during its period of useful life. Every effort shall be made to design and produce units capable of meeting a maximum failure rate of 85 failures per million hours.

4. QUALITY ASSURANCE PROVISIONS

4.1 GENERAL SPECIFICATION. Unless otherwise specified herein, all the quality assurance provisions of Specification ND-1002210 shall form a part of this specification.

4.2 NASA ACCEPTANCE INSPECTION. The NASA acceptance inspection shall be in accordance with Specification FTM-1899950.

5. PREPARATION FOR DELIVERY

5.1 GENERAL. Preparation for delivery shall be in accordance with Specification ND-1002210.

6. NOTES. None.

Notice: When APOLLO G&N drawings, specifications, or other data are used for any purpose other than in connection with a definitely related NASA procurement operation, NASA thereby incurs no responsibility nor any obligation whatsoever; and the fact that NASA may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

EA:pbv

1899950

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
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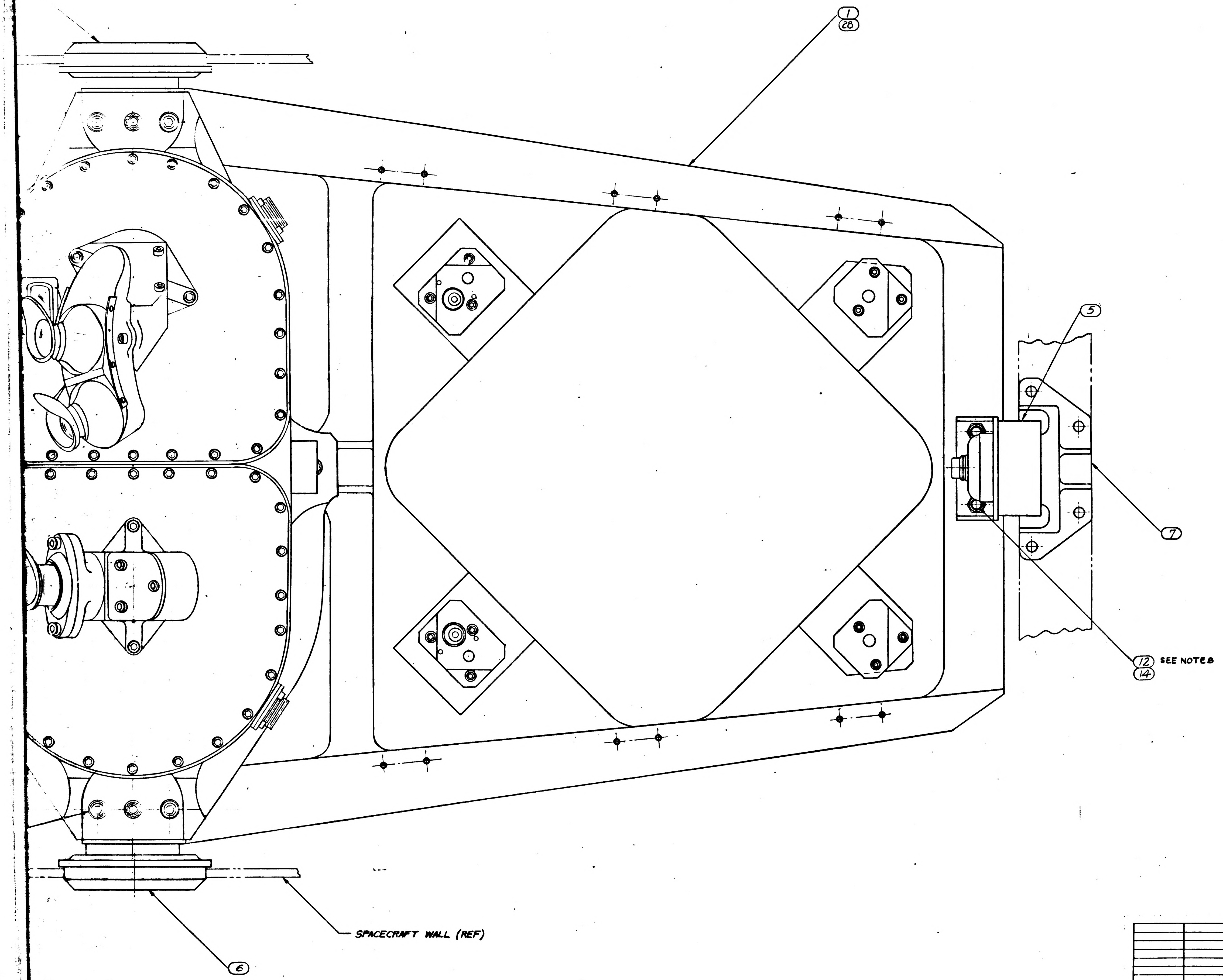

Ⓓ REPLACES REVISION D WITH CHANGE

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		24	24		27	AN960C-10L	WASHER, FLAT
		24	24		26	AN363C-1032	NUT, SELF LOCKING
		4	4		25	MS20005-16	BOLT, INTERNAL WRENCHING
		1	1		24	1011000	OPTICS SUBSYSTEM ASSEMBLY
		1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
		1	1		22	1899954-002	SEAL, BELLOWS
		1	1		21	1899954-001	SEAL, BELLOWS
		6	6		20	1899971	SPRING-SEAL RETAINING
		1	1		19	1899953-002	SEAL, BELLOWS
		1	1		18	1899953-001	SEAL, BELLOWS
		3	3		17	1899976	COLLAR, CENTERING
		6	6		16	1899979	WASHER - SPRING BELLEVILLE
		3	3		15	1899977	WASHER
		6	6		14	AN960C-516L	WASHER, FLAT
		3	3		13	AN960C-716L	WASHER, FLAT
		2	2		12	MS21250-05006	BOLT, 12 POINT EXT WRENCHING
		3	3		10	1899980	BOLT - HEX HEAD
		3	3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
		3	3		8	1899967	BALL, PRECISION
		1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
		1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970.	MOUNT, RESILIENT, FRONT
		1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1	1		2	1899952	BELLOWS ASSEMBLY, SXT
			1		1	1899966	FRAME ASSY - NAVIGATION BASE
		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICS SUBSYSTEM
ASSEMBLY

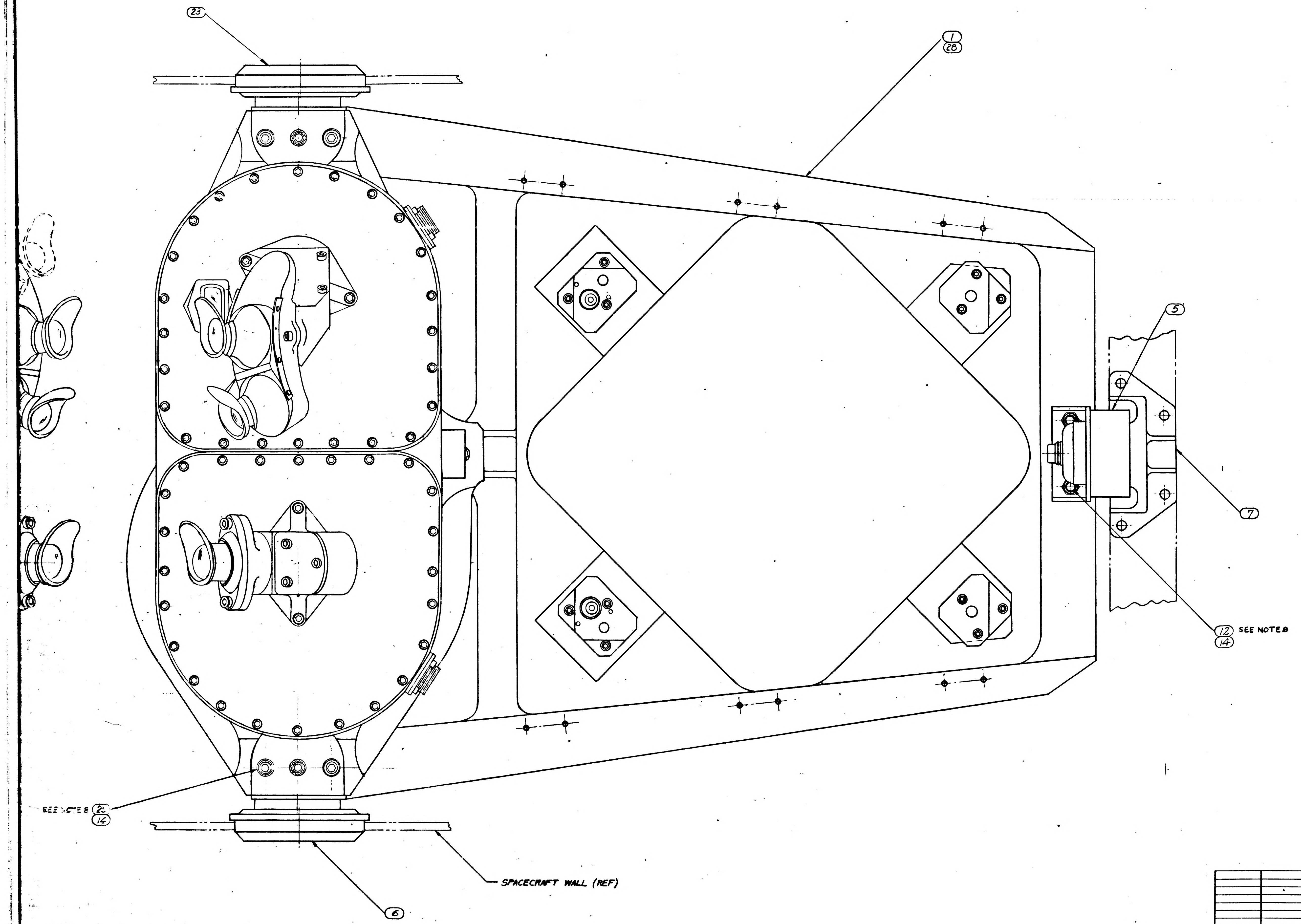
CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET

1899950

INCHES
PHOTOGRAPHIC SCALE ONLY

1899950

SYM	ZONE	DESCRIPTION
E		REPLACES REV D WITH CHANGES



Ⓓ REPLACES REVISION D WITH CHANG

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		24	24		27	AN960C-10L	WASHER,
		24	24		26	AN363C-1032	NUT, SELF
		4	4		25	MS20005-1	BOLT, INTE
		1	1		24	1011000	OPTICS SU
		1	1		23	1899978	SNUBBER,
		1	1		22	1899954-002	SEAL, BELL
		1	1		21	1899954-001	SEAL, BELL
		6	6		20	1899971	SPRING-SE
		1	1		19	1899953-002	SEAL, BELL
		1	1		18	1899953-001	SEAL, BELL
		3	3		17	1899976	COLLAR, C
		6	6		16	1899979	WASHER-
		3	3		15	1899977	WASHER
		6	6		14	AN960C-[illegible]	WASHER, FL
		3	3		13	AN960C-[illegible]	WASHER, F
		2	2		12	MS21250-05006	BOLT, 12
		3	3		10	1899980	[illegible]
		3	3		9	MS21250-0-028	[illegible]
		3	3		8	1899967	[illegible]
					7	1899975	SNUBBER
					6	1899974	SNUBBER
					5	1899969	[illegible]
		2	2		4	1899970	[illegible]
		1	1		3	1899951	BELLOWS
			1		2	1899952	BELLOWS
			1		1	1899966	FRAME ASS
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED							LIST OF PARTS AND MAT

NEXT ASSY	USED ON	APPLICABLE DASH NO.
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DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN DATE 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

SPAC

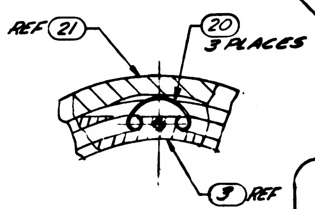
NAVIGATI
OPTICS
ASS

CODE IDENT NO SIZE
SCALE

1899950

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, AND C. TIGHTEN ITEM ⑨ UNTIL L=A+B+C+D +.008. REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 13, 21, 22, & 23 WILL BE SHIPPED SEPARATED FROM ASSEMBLY.
7. TORQUE ITEM 10 TO 1000 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 12 & 25 TO 260 IN-LB. ±10 IN LBS
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9.
10. TORQUE ITEM 26 TO 60±5 IN-LB.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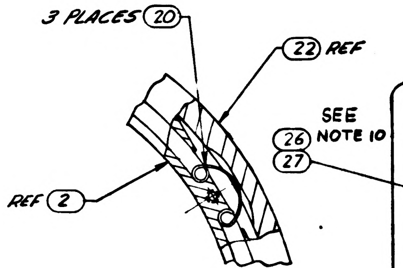
③ REF

DETAIL B
SPRING PLACEMENT
SEE NOTE 4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REF ②
SEE NOTE 10
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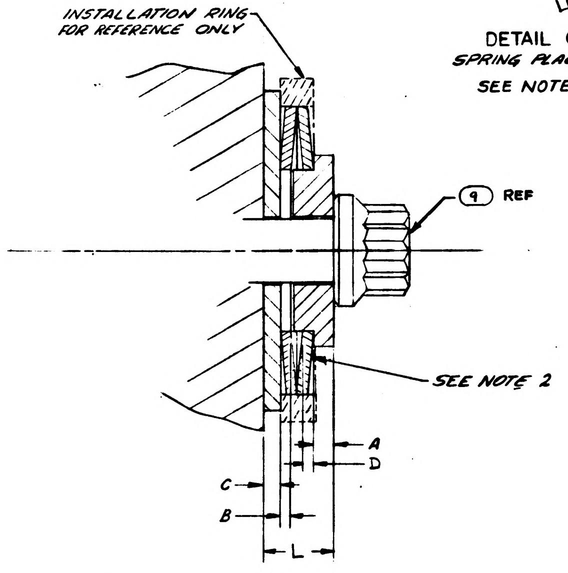
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.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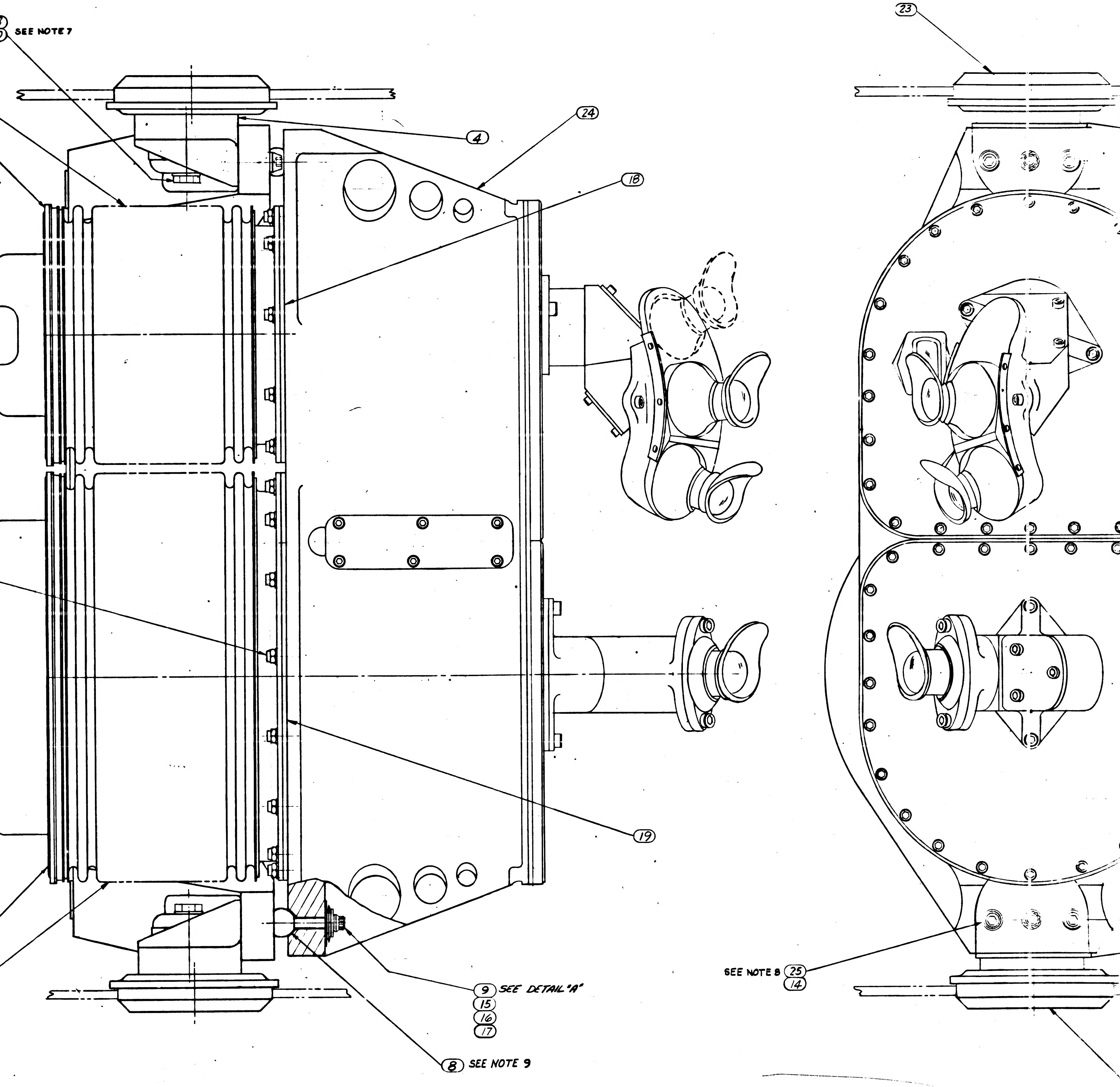
⑨ REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1


⑬
⑩ SEE NOTE 7
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⑨ SEE DETAIL "A"
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⑧ SEE NOTE 9
SEE NOTE 8 ㉕
⑭

INCHES
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS 1899950 E
Original Issue Date: 7-1-64
Release Authority: TDRR 10791
Class A Release

PROCUREMENT SPECIFICATION
FOR
NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA
11-4-64	A	14023	2	WK	WJR
2/9/65	B	16382	2	WK	TM
8-17-65	C	21611	1	WK	TM
11/23/65	D	24301	1-3. Now 4 pages was 3 pages.	WK	--
2/16/66	E	26438	1, 2	WK	---

This specification consists of page i
and 1 to 4 inclusive.

APPROVALS	NASA/MSC	July 64	MIT/IL	ACSP

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Navigation Base and Optical Unit Assembly, Drawing 1899950, hereafter called the assembly.

1.2 CLASSIFICATION. The requirements for the equipment covered by this specification shall be classified as follows. Unless identified by the respective type, all requirements of this specification are applicable for all types.

a. Type I: The requirements for Part Number 1899950-011 shall be designated as Type I in this specification.

b. Type II: The requirements for Part Number 1899950-021 shall be designated as Type II in this specification.

c. Type III: The requirements for Part Number 1899950-031 shall be designated as Type III in this specification.

d. Type IV: The requirements for Part Number 1899950-041 shall be designated as Type IV in this specification.

e. Type V: The requirements for Part Number 1899950-051 shall be designated as Type V in this specification.

f. Type VI: The requirements for Part Number 1899950-061 shall be designated as Type VI in this specification.

g. Type VII: The requirements for Part Number 1899950-071 shall be designated as Type VII in this specification.

h. Type VIII: The requirements for Part Number 1899950-081 shall be designated as Type VIII in this specification.

i. Type IX: The requirements for Part Number 1899950-091 shall be designated as Type IX in this specification.

j. Type X: The requirements for Part Number 1899950-111 shall be designated as Type X in this specification.

k. Type XI: The requirements for Part Number 1899950-121 shall be designated as Type XI in this specification.

m. Type XII: The requirements for Part Number 1899950-131 shall be designated as Type XII in this specification.

n. Type XIII. The requirements for Part Number 1899950-141 shall be designated as Type XIII in this specification.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of this specification form a part of this specification to the extent specified herein:

SPECIFICATIONS

APOLLO G&N

ND1002210	General Specification for Procurement of APOLLO Guidance and Navigation Assemblies and Subassemblies
ND1002214	General Specification for Preservation, Packaging, Packing and Container Marking of APOLLO Guidance and Navigation Major Assemblies, Assemblies, Subassemblies and Parts
FTM1899950	Final Test Method for Navigation Base and Optical Unit Assembly

DRAWINGS

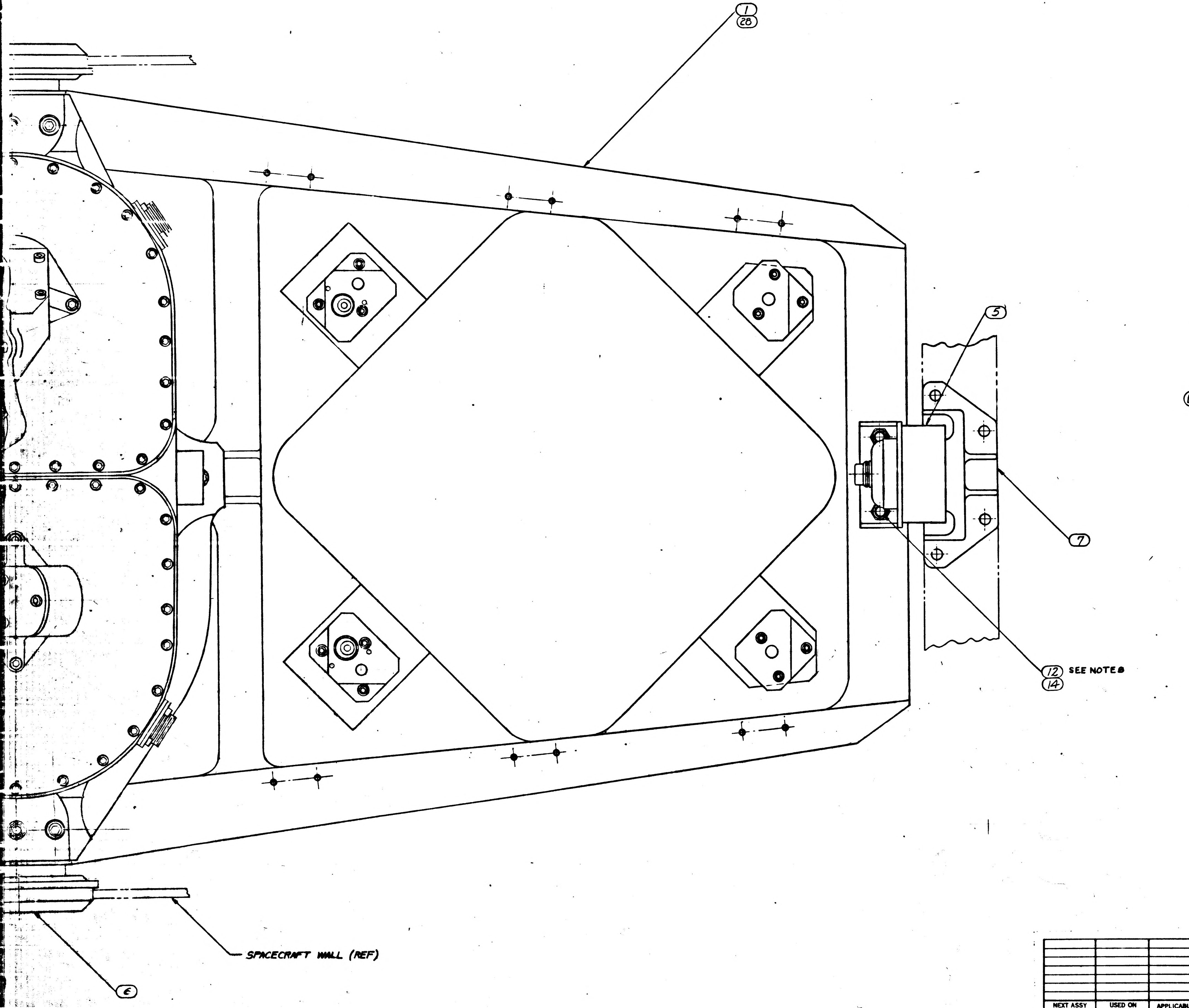
APOLLO G&N

1899950	Navigation Base and Optical Unit Assembly

F	1899950

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV. D WITH CHANGES TDRR 02307		3/[illegible]63	WN
F		REVISED IN ACCORDANCE WITH TDRR 02513		28 [illegible] 63	RNG: [illegible]



Ⓔ REPLACES REVISION D WITH CHANGE

		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
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		24	24		27	AN960C-10L	WASHER, FLAT
		24	24		26	AN363C-1032	NUT, SELF LOCKING
		4	4		25	MS20005-16	BOLT, INTERNAL WRENCHING
		1	1		24	1011000	OPTICS SUBSYSTEM ASSEMBLY
		1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
		1	1		22	1899954-002	SEAL, BELLOWS
		1	1		21	1899954-001	SEAL, BELLOWS
		6	6		20	1899971	SPRING-SEAL RETAINING
		1	1		19	1899953-002	SEAL, BELLOWS
		1	1		18	1899953-001	SEAL, BELLOWS
		3	3		17	1899976	COLLAR, CENTERING
		6	6		16	1899979	WASHER-SPRING BELLEVILLE
		3	3		15	1899977	WASHER
		6	6		14	AN960C-516L	WASHER, FLAT
		3	3		13	AN960C-716L	WASHER, FLAT
		2	2		12	MS21250-05006	BOLT, 12 POINT EXT WRENCHING
		3	3		10	1899980	BOLT-HEX HEAD
		3	3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
		3	3		8	1899967	BALL, PRECISION
		1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
		1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970	MOUNT, RESILIENT, FRONT
		1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1	1		2	1899952	BELLOWS ASSEMBLY, SXT
			1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED M. [illegible]IKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODBL 12 APR 63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 31 [illegible] 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND OPTICS SUBSYSTEM ASSEMBLY

CODE IDENT NO. | SIZE J | 1899950
SCALE FULL | SHEET 1 OF 1

1899950 F

INCHES
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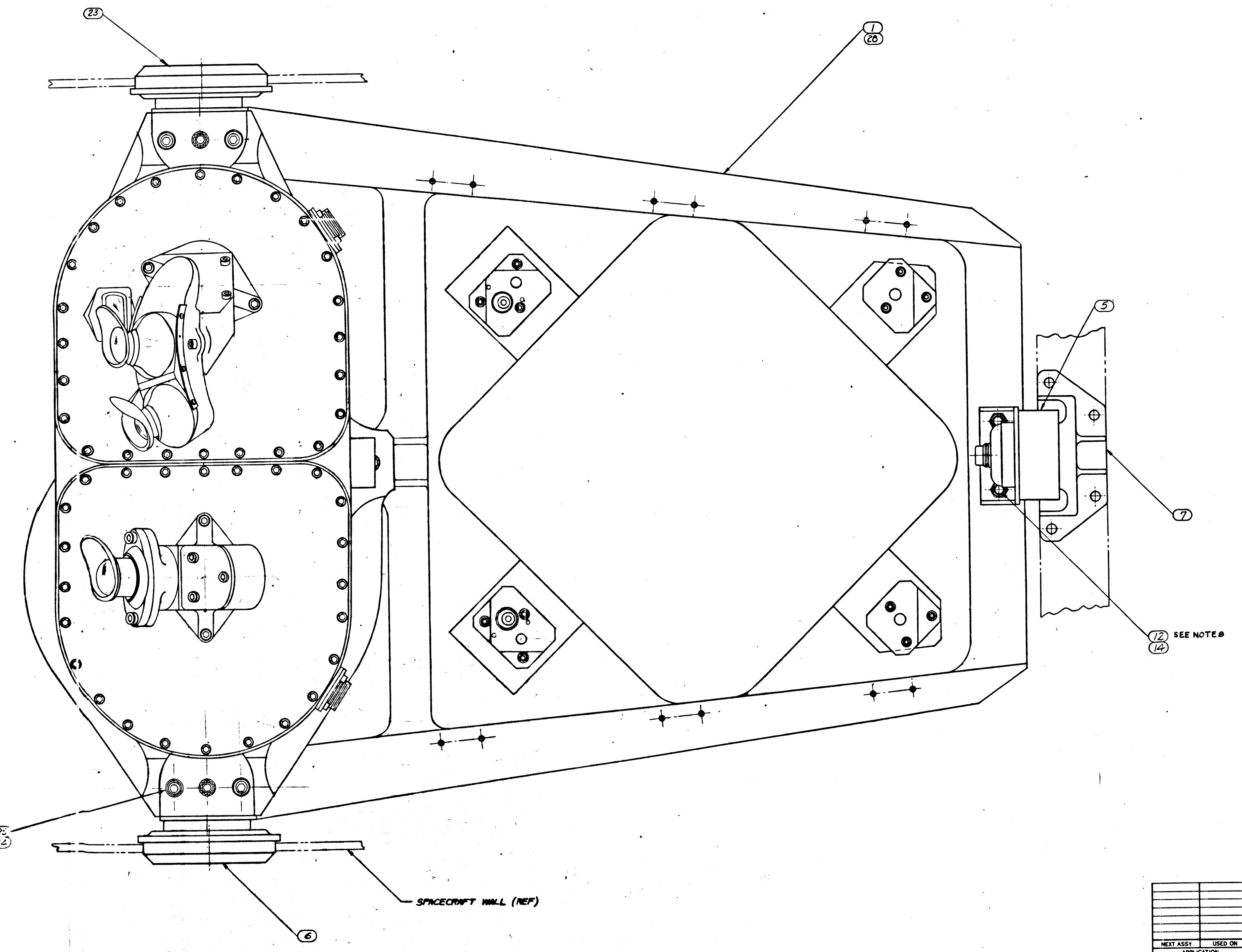
PHOTOGRAPHIC SCALE ONLY

F3 1899950

SYM	ZONE	DESCR
E		REPLACES [illegible] WITH CHANGE
E		REVISED [illegible] CORR O



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		24	24		26	AN363C-1032	NUT,
		4	4		25	MS20005-16	BOLT
		1	1		24	1011000	OPTIC
		1	1		23	1899978	SNU
		1	1		22	1899954-002	SEAL
		1	1		21	1899954-001	SEAL
		6	6		20	1899971	SPRIN
		1	1		19	1899953-002	SEAL
		1	1		18	1899953-001	SEAL
		3	3		17	1899976	COL
		6	6		16	18999-9	WASH
		3	3		15	1899977	WAS
		6	6		14	AN960C-[illegible]	WASH
		3	3		13	AN960C-[illegible]L	WASH
		2	2		12	MS21250-05006	BOLT
		3	3		10	1899980	BOL
		3	3		9	MS21250-0[illegible]029	BOLT
		3	3		8	1899967	[illegible]
					7	1899975	[illegible]
					6	1899974	[illegible]
			1		5	1899969	[illegible]
		2	2		4	1899970	[illegible]
			1		3	1899951	[illegible]
			1		2	1899952	[illegible]
			1		1	1899966	[illegible]
QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCL OR DESC

LIST OF PARTS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN F. KORACIN	DATE 11 APR 63
CHECKED MALIKOWSKI	12 APR 63
APPROVAL J. HANN	12 APR 63
APPROVAL A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

CODE IDENT NO

SCALE FULL

NAV OP

INCHES
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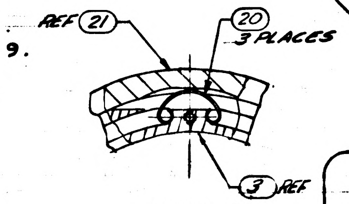
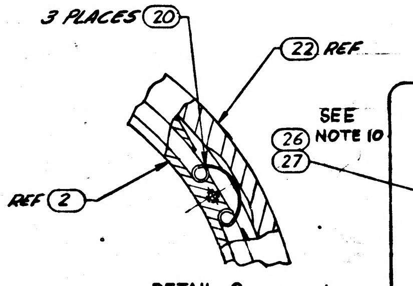
PHOTOGRAPHIC SCALE ONLY

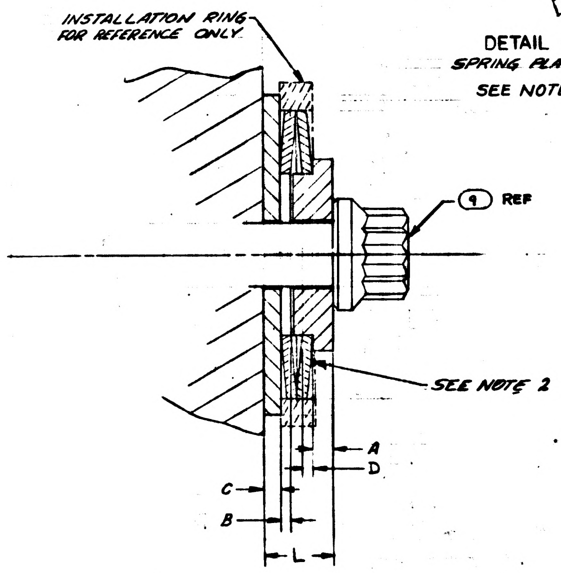
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, AND C. TIGHTEN ITEM ⑨ UNTIL L=A+B+C+D +.008. REPEAT STEPS FOR EACH OPTICS MOUNT POINT.
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 13, 21, 22, & 23 WILL BE SHIPPED SEPARATED FROM ASSEMBLY.
7. TORQUE ITEM 10 TO 1000 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 12 & 25 TO 260 IN-LB. ±10 IN LBS
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY


REF ㉑
⑳ 3 PLACES
③ REF

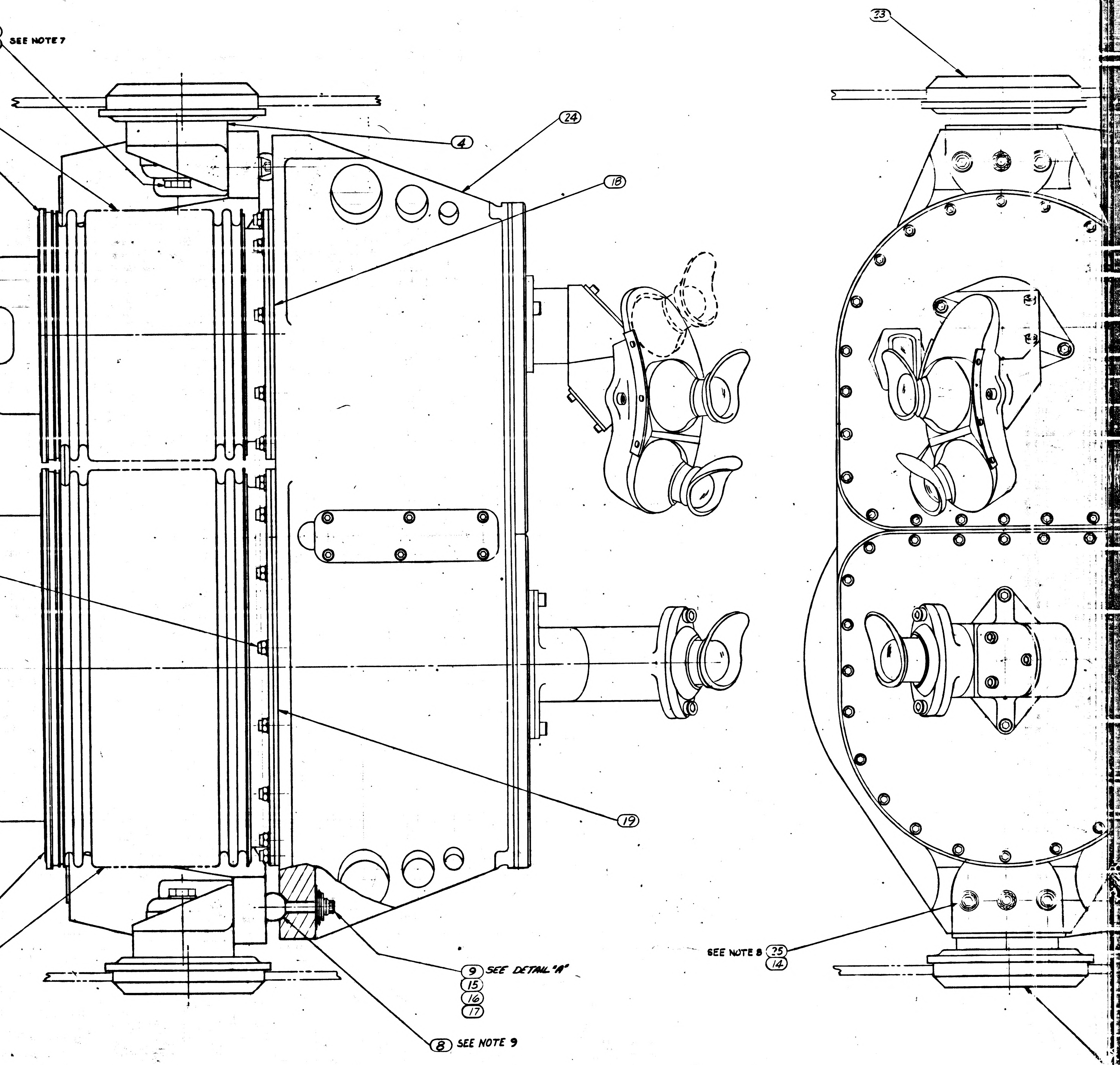
DETAIL B
SPRING PLACEMENT
SEE NOTE 4


3 PLACES ⑳
㉒ REF.
REF ②

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.


INSTALLATION RING FOR REFERENCE ONLY
⑨ REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1


⑬
⑩ SEE NOTE 7
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SEE NOTE 10
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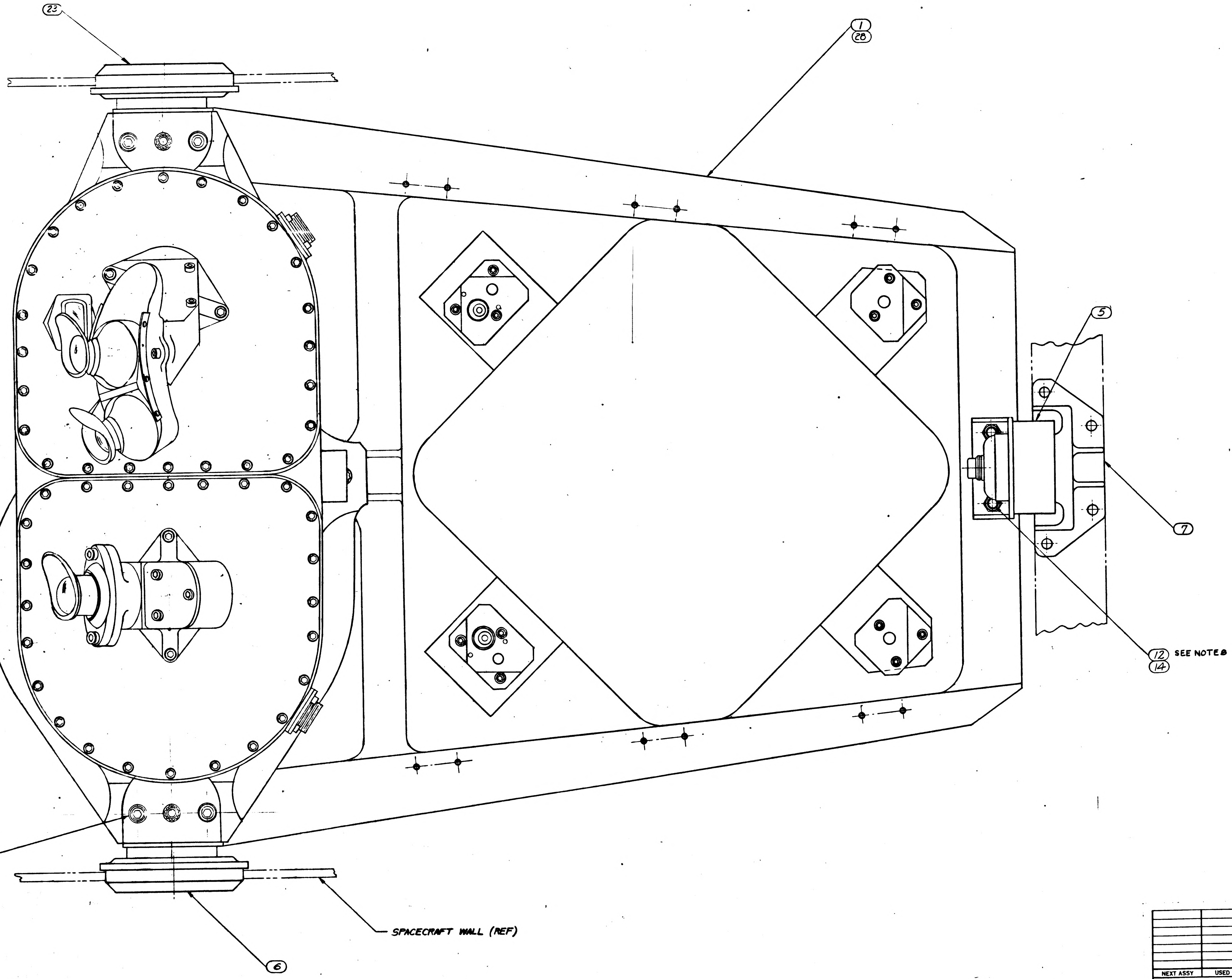
⑨ SEE DETAIL "A"
⑮
⑯
⑰
⑧ SEE NOTE 9
SEE NOTE 8 ㉕
⑭

INCHES
PHOTOGRAPHIC SCALE ONLY

1899950 G

SYM	ZONE	DESCRIPTION	CHG NO
Ⓐ E		REPLACES REV. D WITH CHANGES T.D.R.R. 03307	
Ⓐ F		REVISED IN ACCORDANCE WITH TDRR 02513	
Ⓐ G2		REVISED PER TDRR NO 03098	



Ⓔ REPLACES REVISION D WITH CHANGE

		1			28	1899982	FRAME ASS'Y, NAV. BASE
		24	24		27	AN960C-10L	WASHER, FLAT
		24	24		26	AN363C-1032	NUT, SELF LOCKING
		4	4		25	MS20005-16	BOLT, INTERNAL WRENCHI
		1	1		24	1011000	OPTICS SUBSYSTEM ASSE
		1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP)
		1	1		22	1899954-002	SEAL, BELLOWS
		1	1		21	1899954-001	SEAL, BELLOWS
		6	6		20	1899971	SPRING-SEAL RETAINING
		1	1		19	1899953-002	SEAL, BELLOWS
		1	1		18	1899953-001	SEAL, BELLOWS
		3	3		17	1899976	COLLAR, CENTERING
		6	6		16	1899979	WASHER - SPRING BELLEVILL
		3	3		15	1899977	WASHER
		6	6		14	AN960C-516L	WASHER, FLAT
		2	2		12	MS21250-05006	BOLT, 12 POINT EXT WRENC
		3	3		10	1899980	BOLT - HEX HEAD
		3	3		9	MS21250-04028	BOLT, 12 POINT EXT WRENC
		3	3		8	1899967	BALL, PRECISION
		1	1		7	1899975	SNUBBER, REAR, (INSEP) ASS
		1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970	MOUNT, RESILIENT, FRONT
		1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1	1		2	1899952	BELLOWS ASSEMBLY, SXT
			1		1	1899966	FRAME ASSY - NAVIGATION B
		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND OPTICS SUBSYSTEM ASSEMBLY

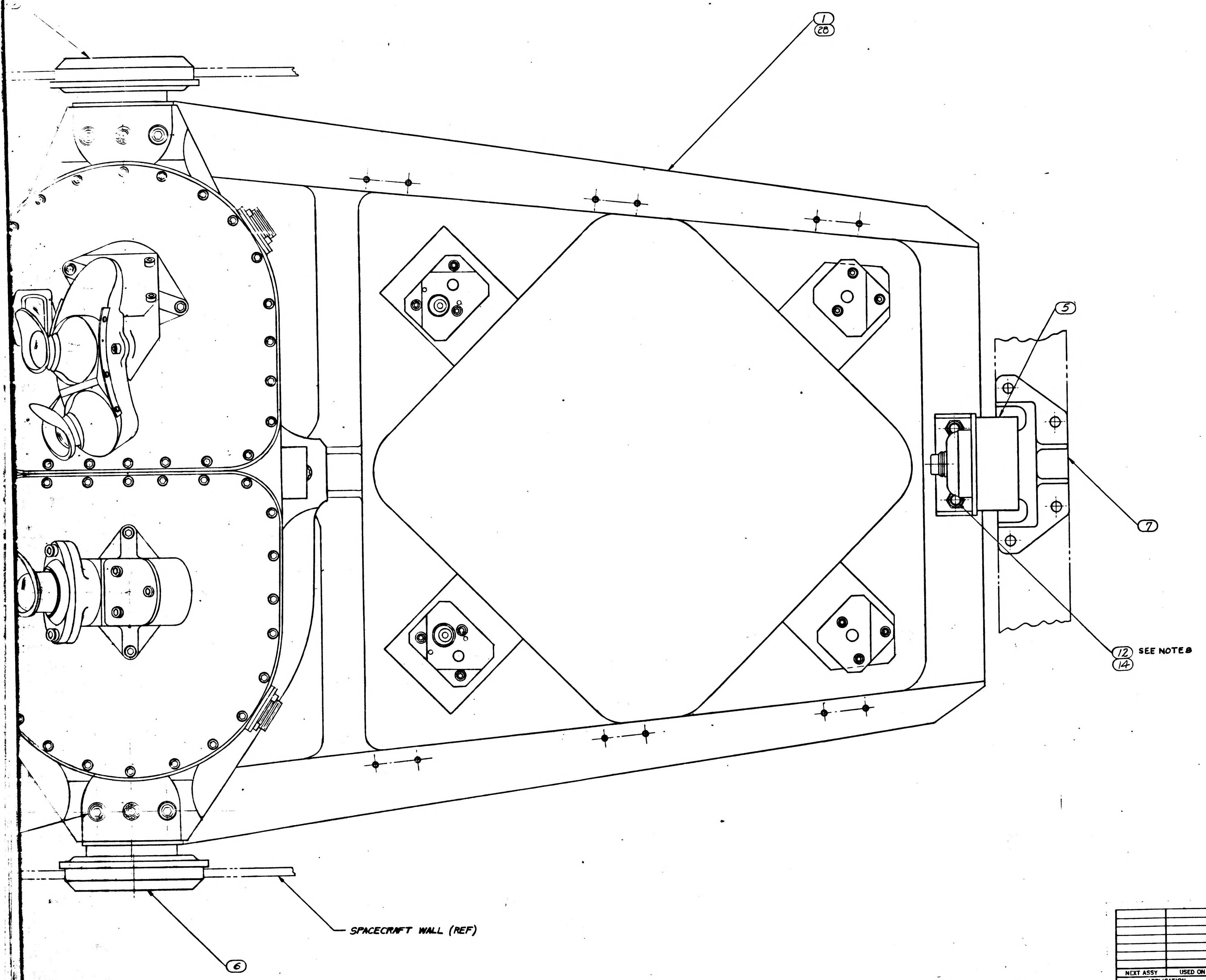
CODE IDENT NO.
SIZE J
1899950
SCALE FULL

1899950 F

F-2

1899950

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV. D WITH CHANGES TDRR 02307		3/[illegible]	WR
F		REVISED IN ACCORDANCE WITH TDRR 02513		[illegible] 63	RWG: RRL
G		REVISED PER TDRR NO. 03098			[illegible] 9/6 63



Ⓔ REPLACES REVISION D WITH CHANGE

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		021	011				
		1			28	1899982	FRAME ASS'Y, NAV. BASE
		24	24		27	AN960C-10L	WASHER, FLAT
		24	24		26	AN363C-1032	NUT, SELF LOCKING
		4	4		25	MS20005-16	BOLT, INTERNAL WRENCHING
		1	1		24	1011000	OPTICS SUBSYSTEM ASSEMBLY
		1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
		1	1		22	1899954-002	SEAL, BELLOWS
		1	1		21	1899954-001	SEAL, BELLOWS
		6	6		20	1899971	SPRING-SEAL RETAINING
		1	1		19	1899953-002	SEAL, BELLOWS
		1	1		18	1899953-001	SEAL, BELLOWS
		3	3		17	1899976	COLLAR, CENTERING
		6	6		16	1899979	WASHER-SPRING BELLEVILLE
		3	3		15	1899977	WASHER
		6	6		14	AN960C-516L	WASHER, FLAT
		2	2		12	MS21250-05006	BOLT, 12 POINT EXT WRENCHING
		3	3		10	1899980	BOLT-HEX HEAD
		3	3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
		3	3		8	1899967	BALL, PRECISION
		1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
		1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970.	MOUNT, RESILIENT, FRONT
		1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1	1		2	1899952	BELLOWS ASSEMBLY, SXT
			1		1	1899966	FRAME ASSY-NAVIGATION BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

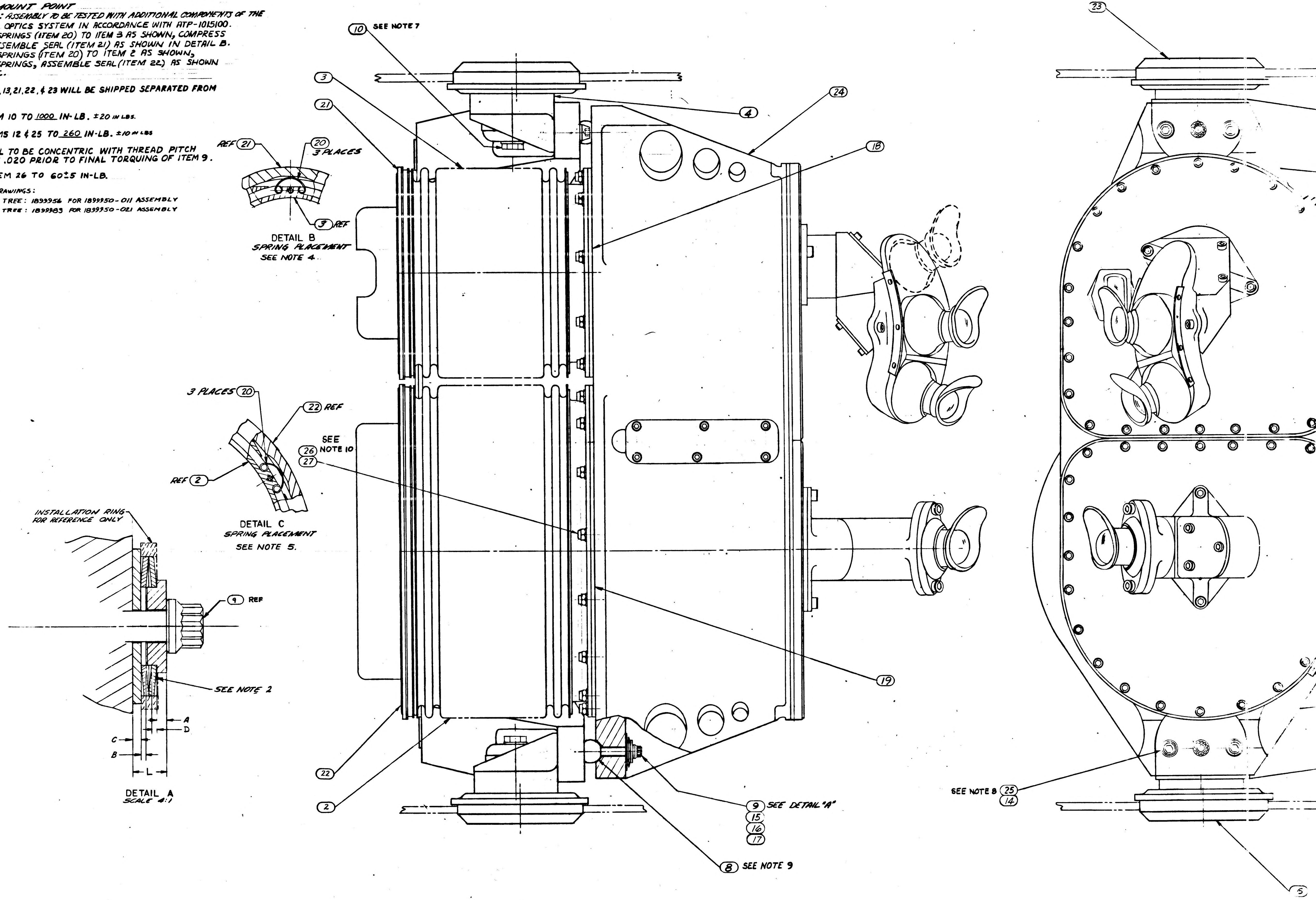
NAVIGATION BASE AND
OPTICS SUBSYSTEM
ASSEMBLY

CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET 1 OF 1

1899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, AND C. TIGHTEN ITEM ⑨ UNTIL L=A+B+C+D +.008. REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 13, 21, 22, & 23 WILL BE SHIPPED SEPARATED FROM ASSEMBLY.
7. TORQUE ITEM 10 TO 1000 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 12 & 25 TO 260 IN-LB. ±10 IN LBS
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY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B
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⑩ SEE NOTE 7
㉓
③
㉑
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⑱
REF ㉑
⑳ 3 PLACES
③ REF
3 PLACES ⑳
㉒ REF
SEE NOTE 10
㉖
㉗
REF ②
INSTALLATION RING FOR REFERENCE ONLY
⑨ REF
SEE NOTE 2
A
D
C
B
L
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㉒
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⑨ SEE DETAIL "A"
⑮
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⑧ SEE NOTE 9
SEE NOTE 8 ㉕
⑭
⑤

DETAIL B
SPRING PLACEMENT
SEE NOTE 4.

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.

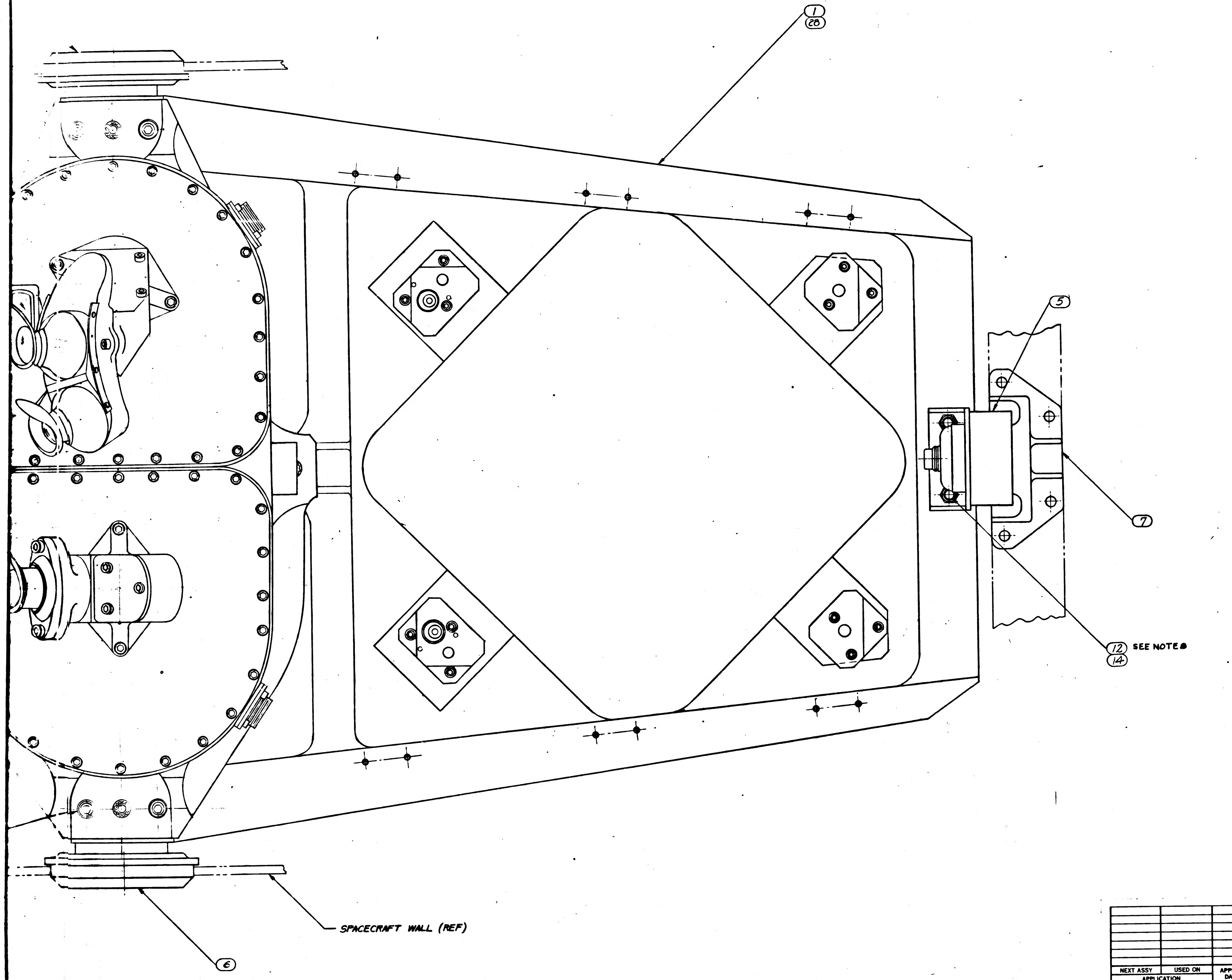
DETAIL A
SCALE 4:1

1899950

H 1899950

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
ⓐ E		REPLACES REV. D WITH CHANGES T.D.R.R. 02307		3/4/63	WK
ⓐ F		REVISED IN ACCORDANCE WITH TDRR 02513		28 Aug 63	RWG: [illegible]
ⓐ G₂		REVISED PER TDRR NO. 03098			WK 9/19/63
H₂		REVISED PER TDRR NO. 03668		21 OCT 63	WK



Ⓔ REPLACES REVISION D WITH CHANGE

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		021	011				
		1			28	1899982	FRAME ASS'Y, NAV. BASE
		24	24		27	AN960C-10L	WASHER, FLAT
		24	24		26	AN363C-1032	NUT, SELF LOCKING
		4	4		25	MS20005-16	BOLT, INTERNAL WRENCHING
		1	1		24	1011000	OPTICAL UNIT
		1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
		1	1		22	1899954-002	SEAL, BELLOWS
		1	1		21	1899954-001	SEAL, BELLOWS
		6	6		20	1899971	SPRING-SEAL RETAINING
		1	1		19	1899953-002	SEAL, BELLOWS
		1	1		18	1899953-001	SEAL, BELLOWS
		3	3		17	1899976	COLLAR, CENTERING
		6	6		16	1899979	WASHER-SPRING BELLEVILLE
		3	3		15	1899977	WASHER
		6	6		14	AN960C-516L	WASHER, FLAT
		2	2		12	MS21250-05006	BOLT, 12 POINT EXT WRENCHING
		3	3		10	1899980	BOLT-HEX HEAD
		3	3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
		3	3		8	1899967	BALL, PRECISION
		1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
		1	1		6	1899974	SNUBBER, FRONT (INSEP) ASSY
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970	MOUNT, RESILIENT, FRONT
		1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1	1		2	1899952	BELLOWS ASSEMBLY SXT
			1		1	1899966	FRAME ASSY-NAVIGATION BASE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN DATE 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

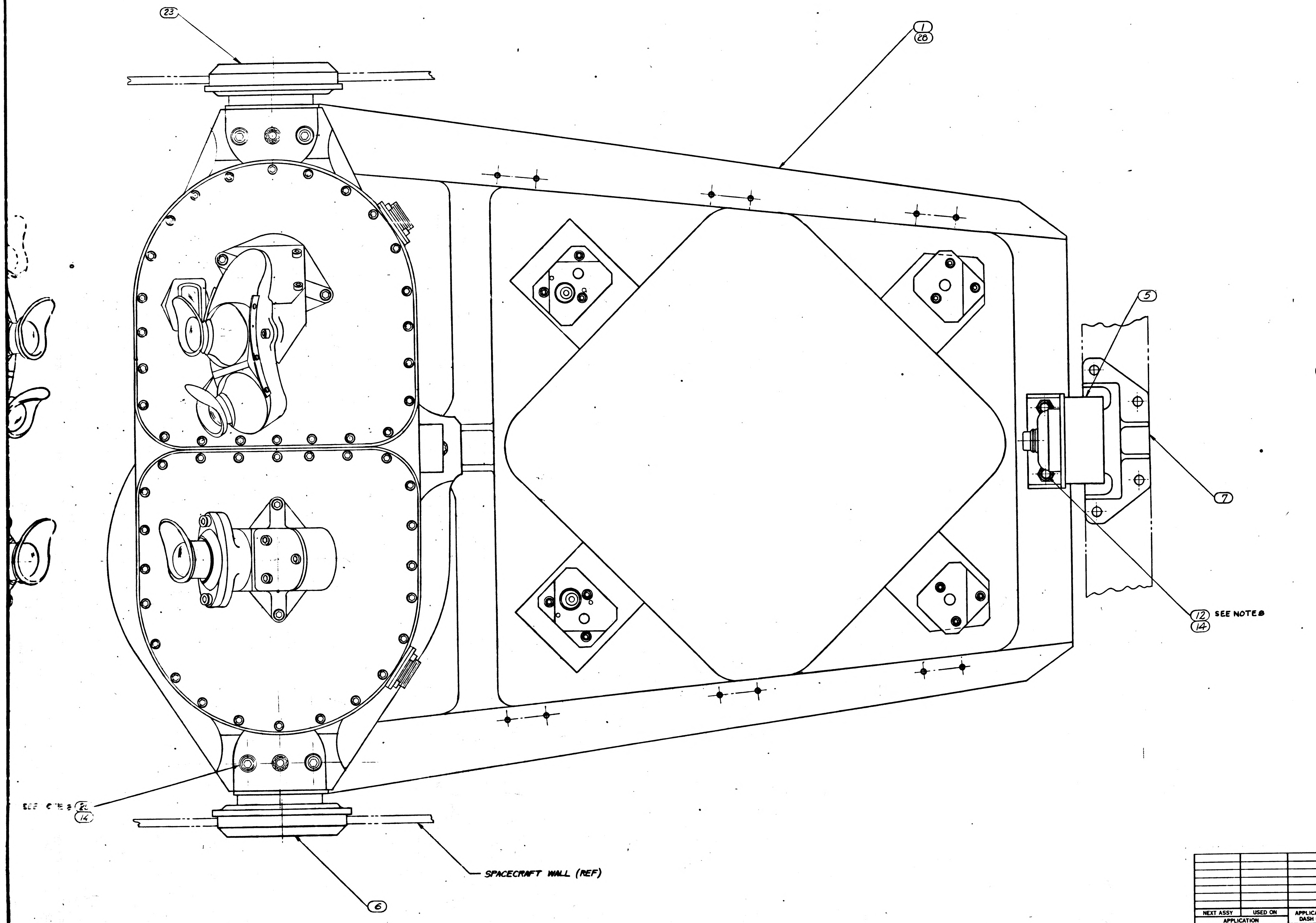
CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET 1 OF 1

1899950 F

F-3

H 1899950

SYM	ZONE	DESCRIPTION	CH NO.	DATE	APPD
E		REPLACES REV D PER TDRR WITH CHANGES 02807			
F		REVISED IN ACCORDANCE WITH TDRR 0253		63	
G2		REVISED PER TDRR NO 03098			
H2		REVISED PER TDRR NO. 03663		2 OCT 63	



Ⓔ REPLACES REVISION D WITH CHANGE

		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1			28	1899982	FRAME ASS'Y, NAV. BASE
		24	24		27	AN960C-10L	WASHER, FLAT
		24	24		26	AN363C-1032	NUT, SELF LOCKING
		4	4		25	MS20005-16	BOLT, INTERNAL WRENCHING
		1	1		24	1011000	OPTICAL UNIT
		1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASS
		1	1		22	1899954-002	SEAL, BELLOWS
		1	1		21	1899954-001	SEAL, BELLOWS
		6	6		20	1899971	SPRING-SEAL RETAINING
		1	1		19	1899953-002	SEAL, BELLOWS
		1	1		18	1899953-001	SEAL, BELLOWS
		3	3		17	1899976	COLLAR, CENTERING
		6	6		16	1899979	WASHER-SPRING BELLEVILLE
		3	3		15	1899977	WASHER
		6	6		14	AN960C-516L	WASHER, FLAT
		2	2		12	MS21250-05006	BOLT, 12 POINT EXT WRENCHIN
		3	3		10	1899980	BOLT-HEX HEAD
		3	3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHIN
		3	3		8	1899967	BALL, PRECISION
		1	1		7	1899975	SNUBBER REAR [illegible] ASSY
		1	1		6	1899974	SNUBBER FRONT [illegible] (INSEP) AS
		1	1		5	1899969	MOUNT RESILIENT REAR
		2	2		4	1899970	MOUNT RESILIENT FRONT
		1	1		3	1899951	BELLOWS [illegible] SET
		1	1		2	1899952	BELLOWS [illegible] EX
			1			1899966	FRAME ASSY NAVIGATION BASE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND OPTICAL ASSEMBLY

CODE IDENT NO. | SIZE J | 1899950
SCALE FULL | SHEET

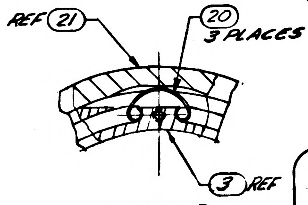
1899950 F

INCHES 0 1
PHOTOGRAPHIC SCALE ONLY

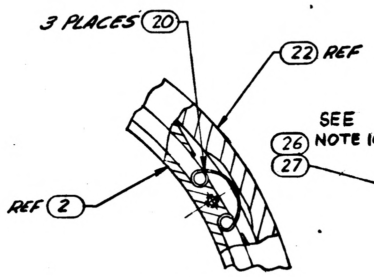
F-12

NOTES:

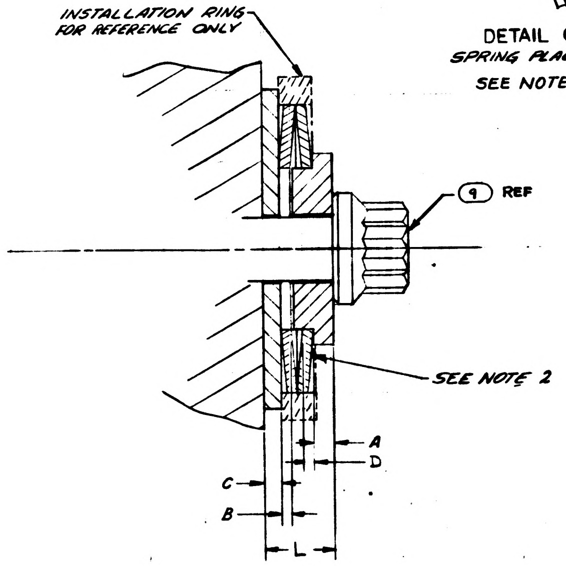
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, AND C. TIGHTEN ITEM ⑨ UNTIL L=A+B+C+D +.008. REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 13, 21, 22, & 23 WILL BE SHIPPED SEPARATED FROM ASSEMBLY.
7. TORQUE ITEM 10 TO 1000 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 12 & 25 TO 260 IN-LB. ±10 IN LBS
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY


REF 21
20
3 PLACES
3 REF

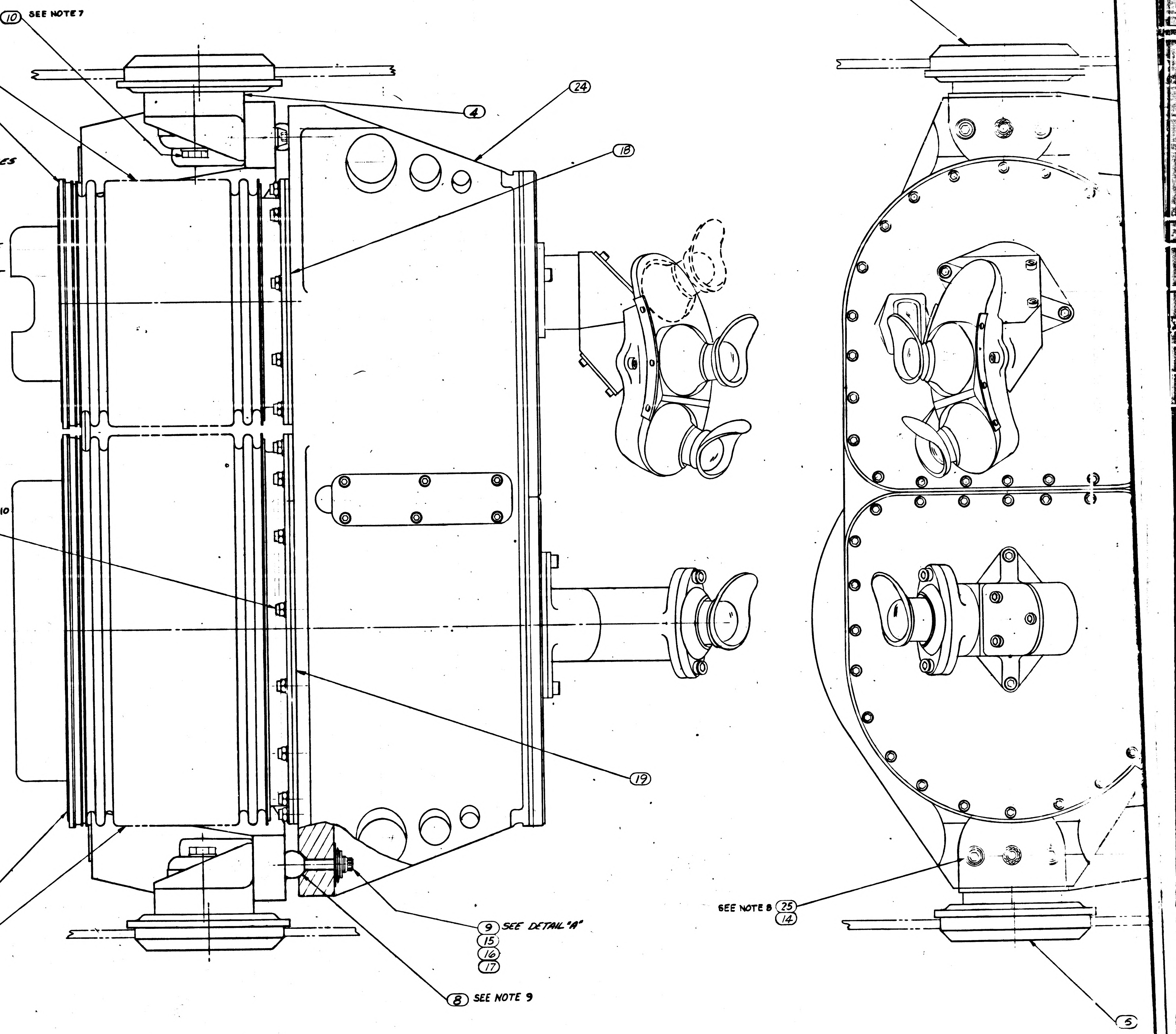
DETAIL B
SPRING PLACEMENT
SEE NOTE 4


3 PLACES 20
22 REF
REF 2

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.


INSTALLATION RING FOR REFERENCE ONLY
9 REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1


10 SEE NOTE 7
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SEE NOTE 10
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9 SEE DETAIL "A"
15
16
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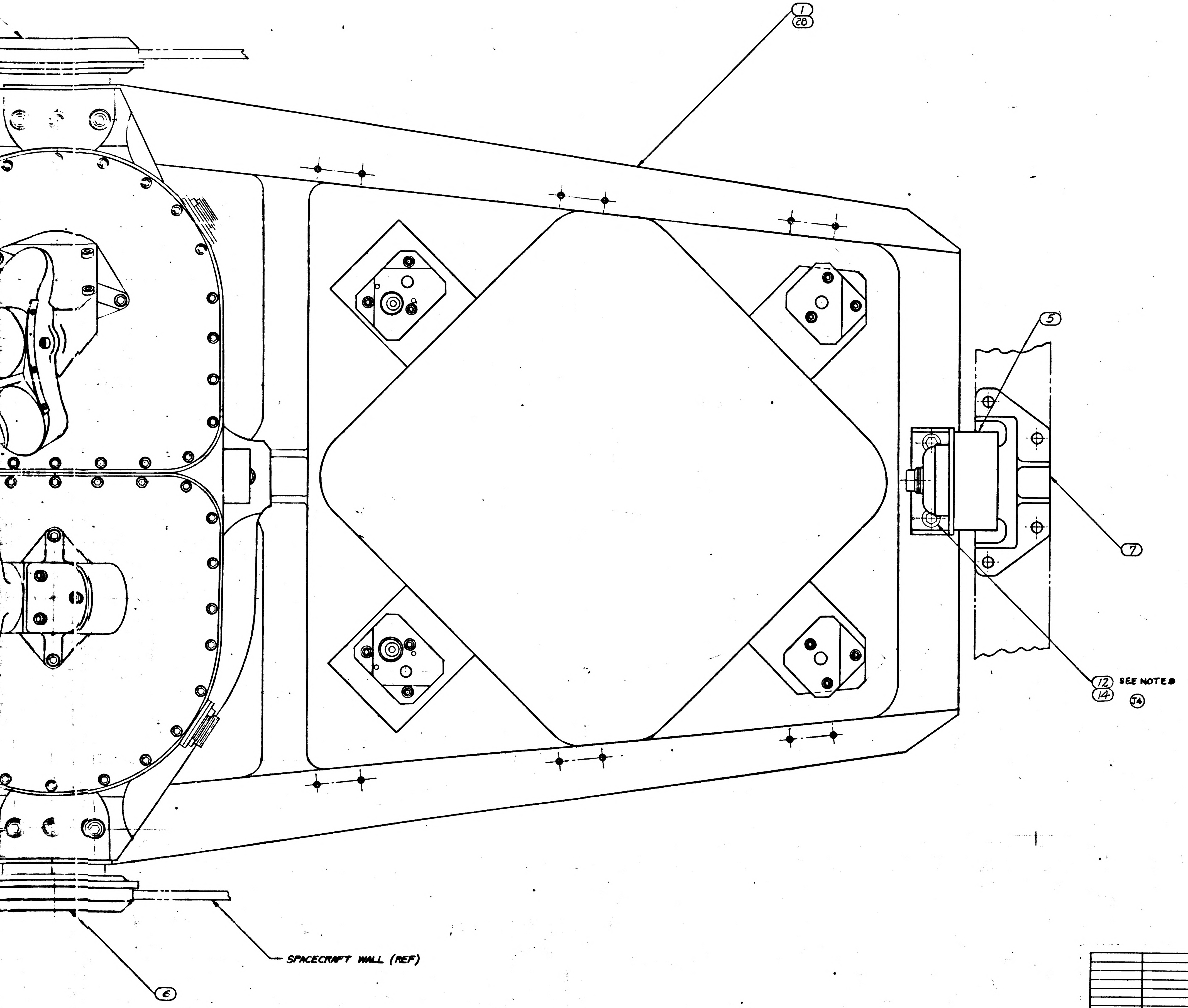
8 SEE NOTE 9
SEE NOTE 8 25
14
5

1899950

INCHES
PHOTOGRAPHIC SCALE ONLY

J 1899950

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV. D WITH CHANGES TDRR. 02307		3/1/63	WN
F		REVISED IN ACCORDANCE WITH TDRR 02513		29 AUG 63	RWG:
G2		REVISED PER TDRR NO. 03098			
H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J6		REVISED PER TDRR NO. 04990		17 DEC. 63	



Ⓔ REPLACES REVISION D WITH CHANGE

	QUANTITY REQUIRED 021	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1			28	1899982	FRAME ASS'Y, NAV. BASE
	24	24		27	AN960C-10L	WASHER, FLAT
	24	24		26	AN363C-1032	NUT, SELF LOCKING
(J1)	4	4		25	MS20005-12	BOLT, INTERNAL WRENCHING
	1	1		24	1011000	OPTICAL UNIT
	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
	1	1		22	1899954-002	SEAL, BELLOWS
	1	1		21	1899954-001	SEAL, BELLOWS
	6	6		20	1899971	SPRING-SEAL RETAINING
	1	1		19	1899953-002	SEAL, BELLOWS
	1	1		18	1899953-001	SEAL, BELLOWS
	3	3		17	1899976	COLLAR, CENTERING
	6	6		16	1899979	WASHER-SPRING BELLEVILLE
	3	3		15	1899977	WASHER
	6	6		14	AN960C-516L	WASHER, FLAT
(J2)	2	2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
	3	3		10	1899980	BOLT-HEX HEAD
	3	3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
	3	3		8	1899967	BALL, PRECISION
	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
	1	1		6	1899974	SNUBBER, FRONT [illegible] (INSEP) ASSY
	1	1		5	1899969	MOUNT, RESILIENT, REAR
	2	2		4	1899970	MOUNT, RESILIENT, FRONT
	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
		1		1	1899966	FRAME ASSY-NAVIGATION BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL 3/1/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

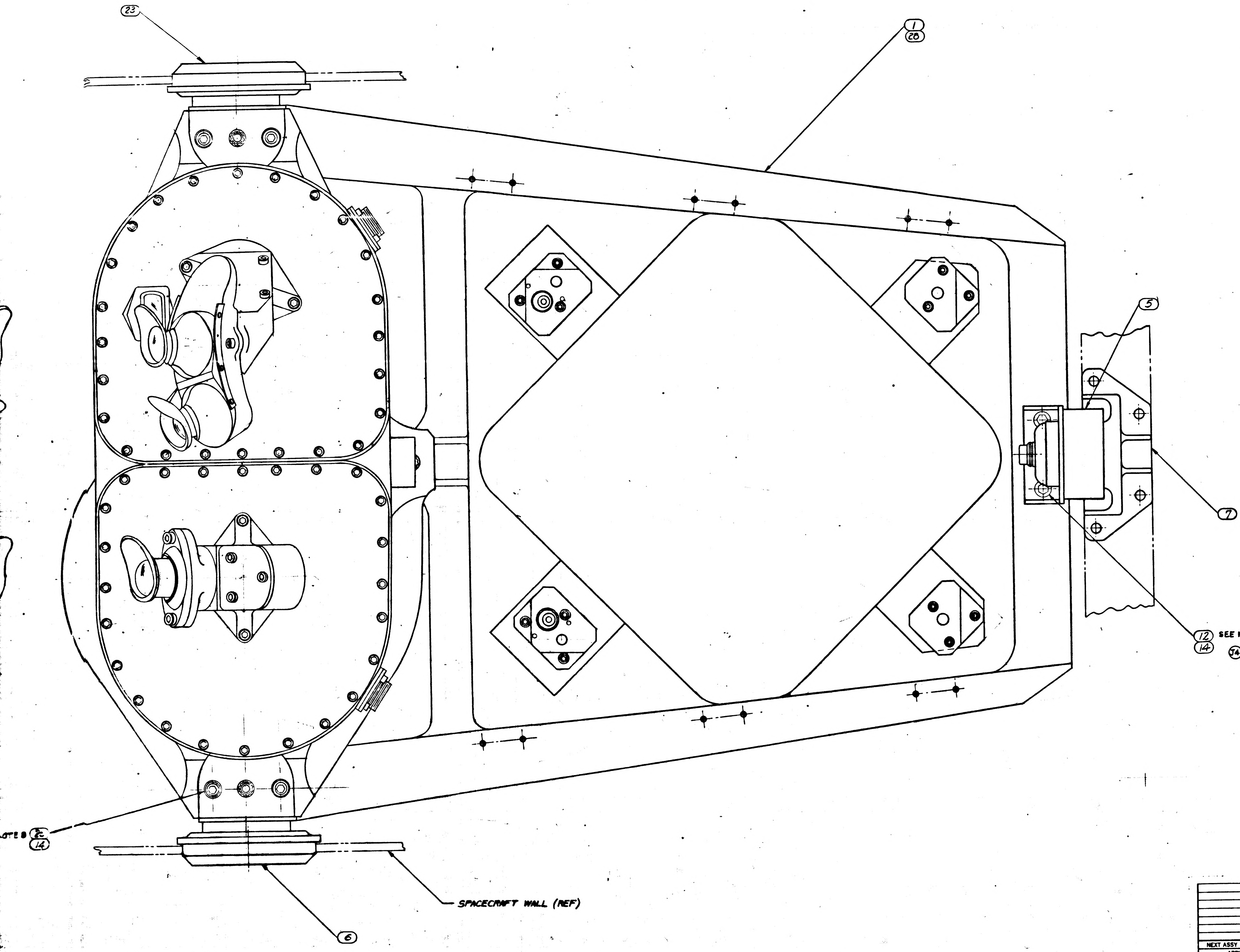
NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET 1 OF 1

1899950

F3

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV. D WITH CHANGES TDRR 03307		[illegible]	WR
F		REVISED IN ACCORDANCE WITH TDRR 02513		[illegible] 63	RWG
G		REVISED PER TDRR NO. 03098			[illegible]
H2		REVISED PER TDRR NO. 03668		21 OCT 63	WR
J6		REVISED PER TDRR NO. 04990		DEC 63	



Ⓔ REPLACES REVISION D WITH CHANGE

J1

J2

QUANTITY REQUIRED 021	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24		27	AN960C-10L	WASHER, FLAT
24	24		26	AN363C-1032	NUT, SELF LOCKING
4	4		25	MS20005-12	BOLT, INTERNAL WRENCHING
1	1		24	1011000	OPTICAL UNIT
1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
1	1		22	1899954-002	SEAL, BELLOWS
1	1		21	1899954-001	SEAL, BELLOWS
6	6		20	1899971	SPRING-SEAL RETAINING
1	1		19	1899953-002	SEAL, BELLOWS
1	1		18	1899953-001	SEAL, BELLOWS
3	3		17	1899976	COLLAR, CENTERING
6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3		15	1899977	WASHER
6	6		14	AN960C-516L	WASHER, FLAT
2	2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
3	3		10	1899980	BOLT-HEX HEAD
3	3		9	MS 21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3		8	1899967	BALL, PRECISION
1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1		6	1899974	SNUBBER, FRONT (INSEP) ASSY
1	1		5	1899969	MOUNT, RESILIENT REAR
2	2		4	1899970.	MOUNT, RESILIENT FRONT
1	1		3	1899951	BELLOWS ASSY [illegible], SCT
1	1		2	1899952	BELLOWS ASSY [illegible], SXT
	1		1	1899966	FRAME ASSY - NAVIGATION BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET 1 OF 1

1899950 J

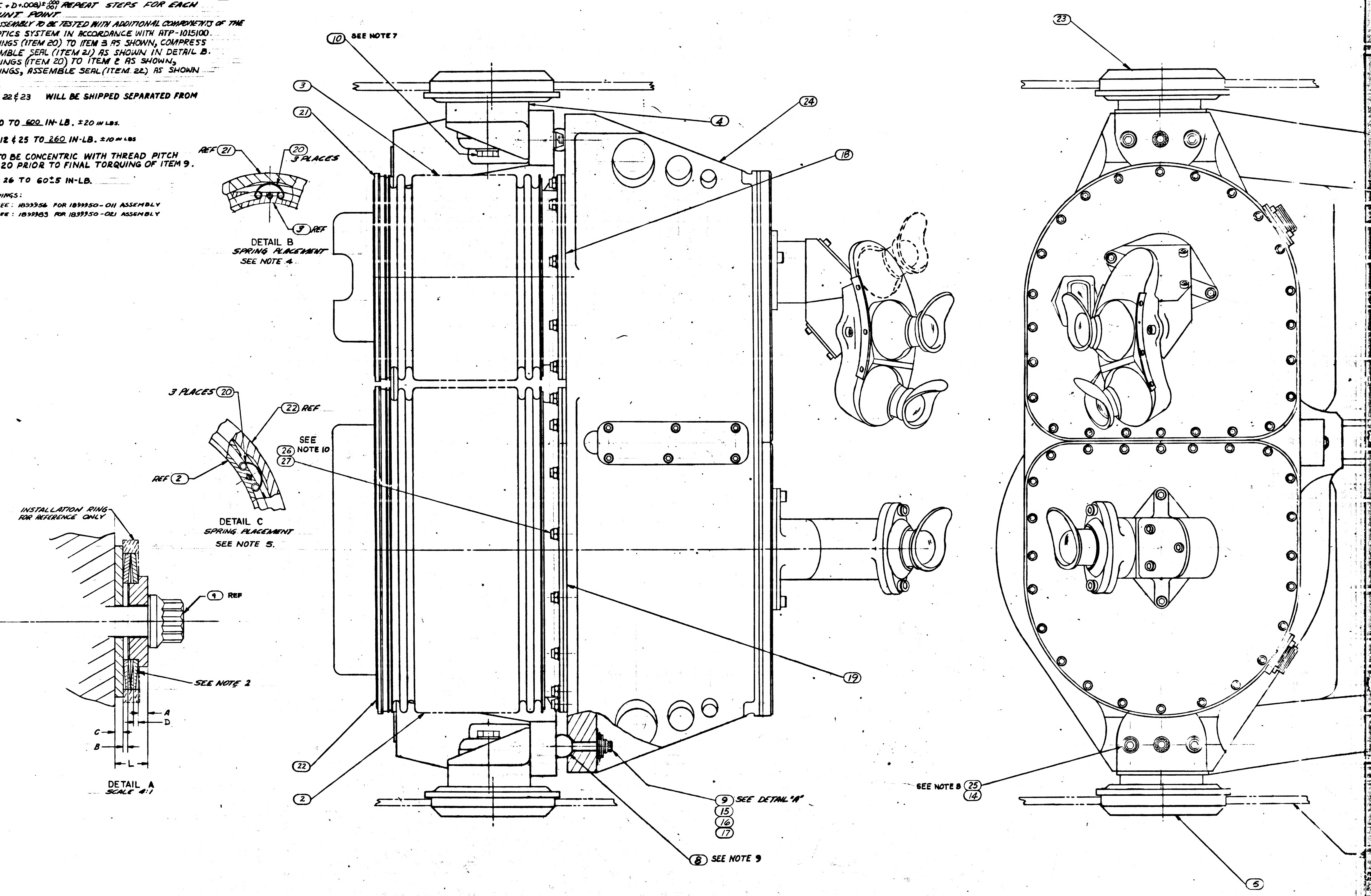
1899950

INCHES
0 1
PHOTOGRAPHIC SCALE ONLY

F-2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, AND C. TIGHTEN ITEM ⑨ UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 21, 22 & 23 WILL BE SHIPPED SEPARATED FROM ASSEMBLY.
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 12 & 25 TO 260 IN-LB. ±10 IN LBS
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY

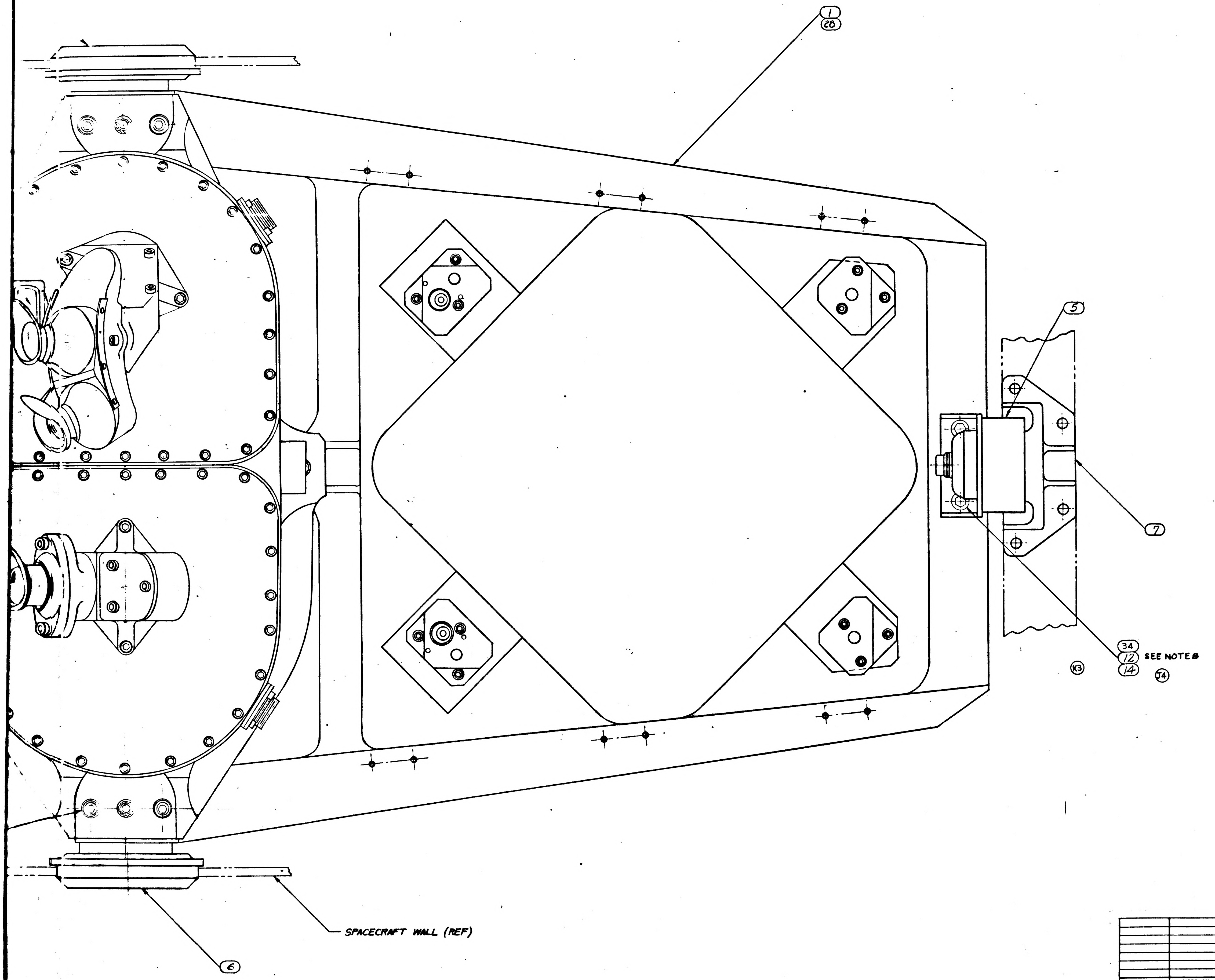

⑩ SEE NOTE 7
③
㉑
㉔
④
⑱
㉓
REF ㉑
⑳ 3 PLACES
③ REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4.
3 PLACES ⑳
㉒ REF
REF ②
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
SEE NOTE 10 ㉖ ㉗
INSTALLATION RING FOR REFERENCE ONLY
⑨ REF
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
⑲
㉒
②
⑨ SEE DETAIL "A"
⑮
⑯
⑰
⑧ SEE NOTE 9
SEE NOTE 8 ㉕ ⑭
⑤

1899950 F

INCHES
PHOTOGRAPHIC SCALE ONLY

1899950 K

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV. D WITH CHANGES TDRR. 02307		3/ /63	WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		2 /49 63	RWG: RZL
G		REVISED PER TDRR NO. 03098			WK 9/18/63
H		REVISED PER TDRR NO. 03668		2 OCT 63	WK
J		REVISED PER TDRR NO. 04990		DEC 63	WK
K		REVISED PER TDRR NO. 06253		6 FEB 64	WK



Ⓔ REPLACES REVISION D WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
			3			33	1899984	CENTERING COLLAR
K2			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	
			1			30	1899996-001	
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
J1				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. (IN-EP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
			1	1		19	1899953-002	SEAL, BELLOWS
K1				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER - SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516L	WASHER, FLAT
J2				2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT - HEX HEAD
				3		9	MS 21250-04028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR (IN-EP) ASSY
			1	1		6	1899974	SNUBBER, FRONT (IN-EP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			2	2		4	1899970	MOUNT, RESILIENT, FRONT
			1	1		3	1899951	BELLOWS ASSEMBLY SCT
			1	1		2	1899952	BELLOWS ASSEMBLY SXT
				1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN DATE 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

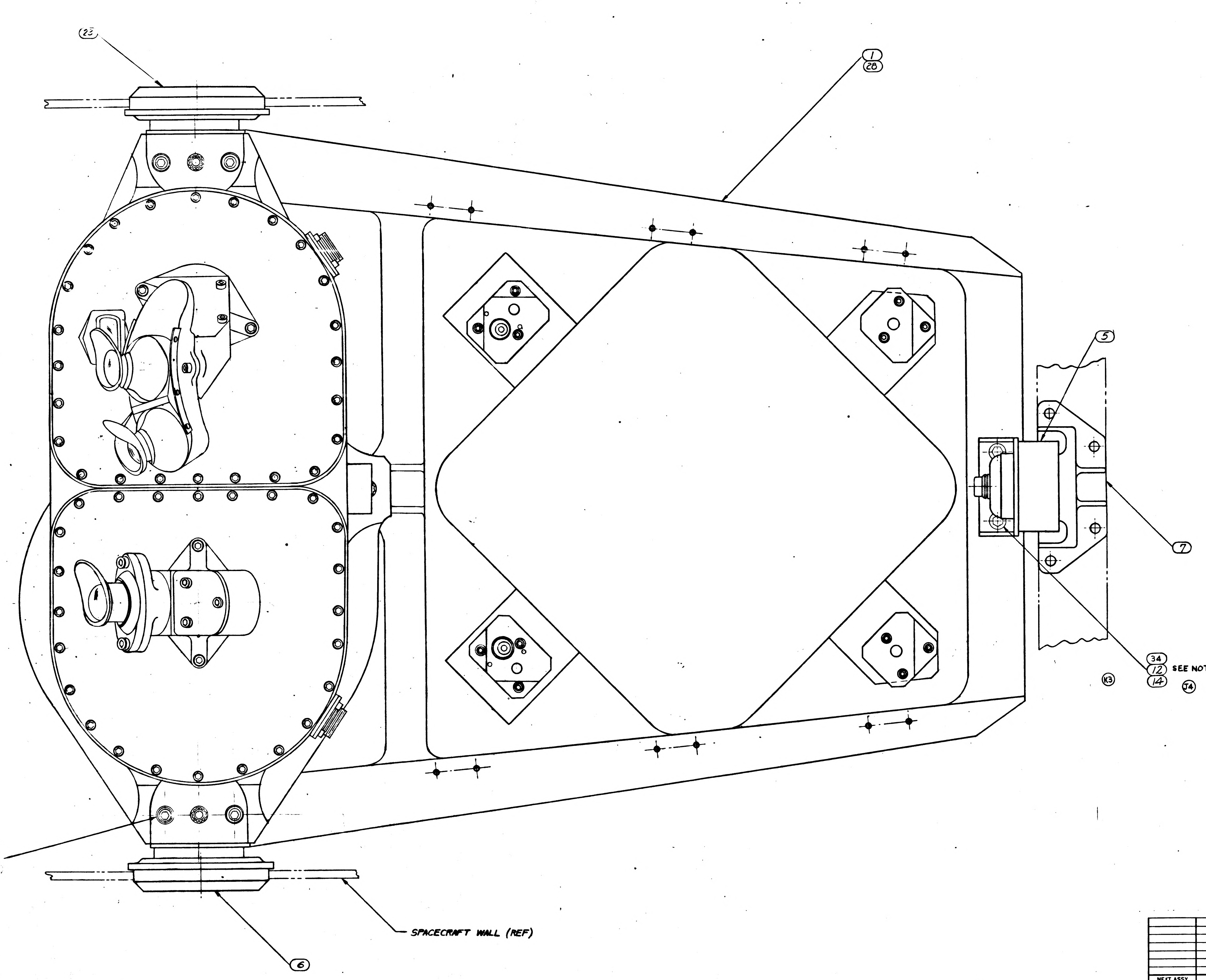
CODE IDENT NO. SIZE J 1899950
SCALE FULL SHEET 1 OF 1

1899950 K

E-3

1899950 K

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGES TDRR 03307		[illegible]	WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		[illegible]	RWG: [illegible]
G₂		REVISED PER TDRR NO. 03098			[illegible]
H₂		REVISED PER TDRR NO. 03668		[illegible]	[illegible]
J₆		REVISED PER TDRR NO. 04990		[illegible]	[illegible]
K₉		REVISED PER TDRR NO. 06253		[illegible]	[illegible]



Ⓔ REPLACES REVISION D WITH CHANGE

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			021	011				
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
			3			33	1899984	CENTERING COLLAR
K2			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	↓
			1			30	1899996-001	↓
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
J1				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. ([illegible]SEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
K1			1	1		19	1899953-002	SEAL, BELLOWS
				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER-SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516	WASHER, FLAT
J2				2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS 21250-0-028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR [illegible] ASSY
			1	1		6	1899974	SNUBBER, FRONT [illegible] (SEP) ASSY
			1	1		5	1899969	MOUNT, RES[illegible] REAR
			2	2		4	1899970	MOUNT, RES[illegible] FRONT
			1	1		3	1899951	BELLOWS [illegible] SCT
			1	1		2	1899952	BELLOWS [illegible] SXT
				1		1	1899966	FRAME ASS[illegible] - [illegible]ON BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

		DATE
DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

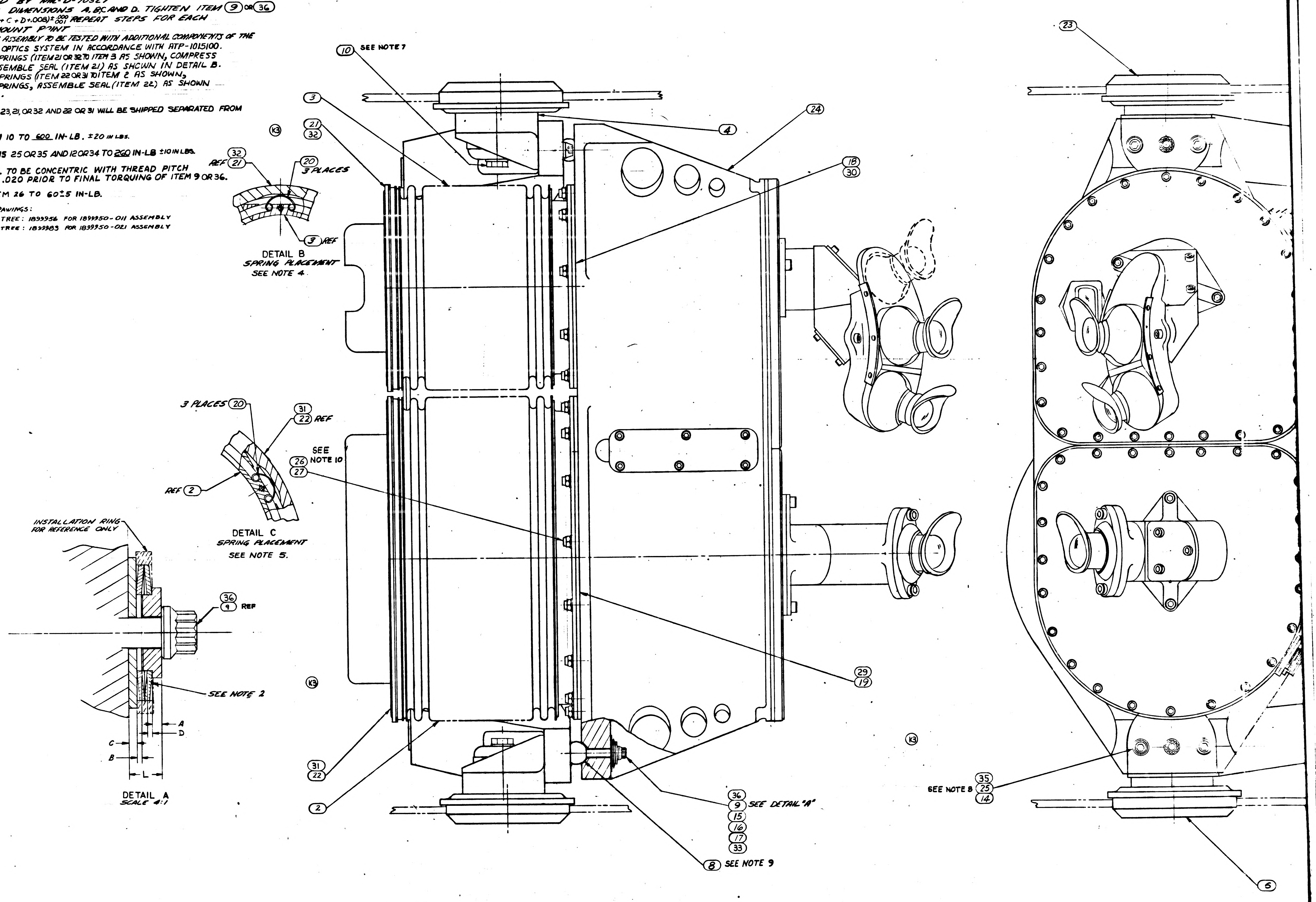
NAVIGATION BASE AND
OPTICS [illegible]
ASSEMBLY

CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET

1899950 K

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM (9) OR (36) UNTIL L=(A+B+C+D+.008)$^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 21 OR 32 TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 22 OR 31 TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 23, 21, OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY.
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY


(32)
REF (21)
(20) 3 PLACES
(3) REF
3 PLACES (20)
(31)
(22) REF
REF (2)
INSTALLATION RING FOR REFERENCE ONLY
(36)
(9) REF
SEE NOTE 2
A
D
C
B
L
(10) SEE NOTE 7
(3)
(21)
(32)
(4)
(24)
(18)
(30)
(23)
SEE NOTE 10
(26)
(27)
(29)
(19)
(31)
(22)
(2)
(36)
(9) SEE DETAIL "A"
(15)
(16)
(17)
(33)
(8) SEE NOTE 9
SEE NOTE 8 (35)
(25)
(14)
(5)

DETAIL B
SPRING PLACEMENT
SEE NOTE 4.

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.

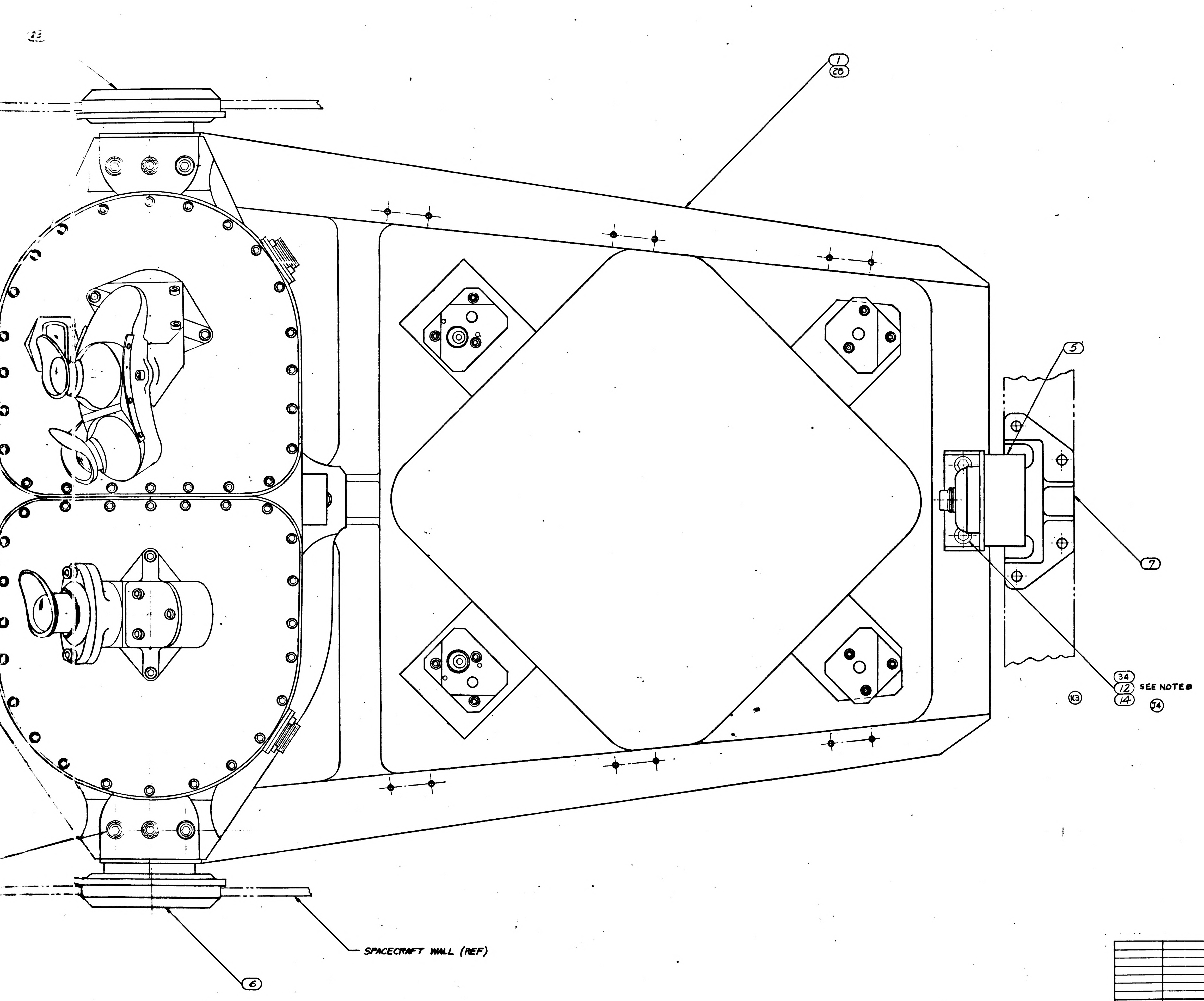
DETAIL A
SCALE 4:1

1899950

INCHES
PHOTOGRAPHIC SCALE ONLY

1899950 L

REVISIONS						
	SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
(A)	E		REPLACES REV. D WITH CHANGES TDRR 03307		63	WH
(4)	F		REVISED IN ACCORDANCE WITH TDRR 02513		63	RWG:
	G2		REVISED PER TDRR NO. 03098			WH 9/19/63
	H2		REVISED PER TDRR NO. 03668		3 OCT 63	WH
(M)	J6		REVISED PER TDRR NO. 04990		DEC 63	
	K9		REVISED PER TDRR NO. 06253		5 FEB 64	WH
	L2		REVISED PER TDRR NO. 06742		AR	WH



Ⓔ REPLACES REVISION D WITH CHANGE

						ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
(L2)			1	1		37	1899999	ISOLATOR LOCKOUT SET (NAV. BASE)
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
(K2)			3			33	1899984	CENTERING COLLAR
			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	↓
			1			30	1899996-001	↓
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
(J1)				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
(K1)			1	1		19	1899953-002	SEAL, BELLOWS
				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER-SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516	WASHER, FLAT
(J2)				2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS 21250-04028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
			1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			2	2		4	1899970	MOUNT, RESILIENT, FRO
			1	1		3	1899951	BELLOWS ASSEMBLY,
			1	1		2	1899952	BELLOWS ASSEMBLY,
				1		1	1899966	FRAME ASSY-NAVIGATION BASE
			021	011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

CODE IDENT NO. SIZE J 1899950
SCALE FULL SHEET OF 1

1899950

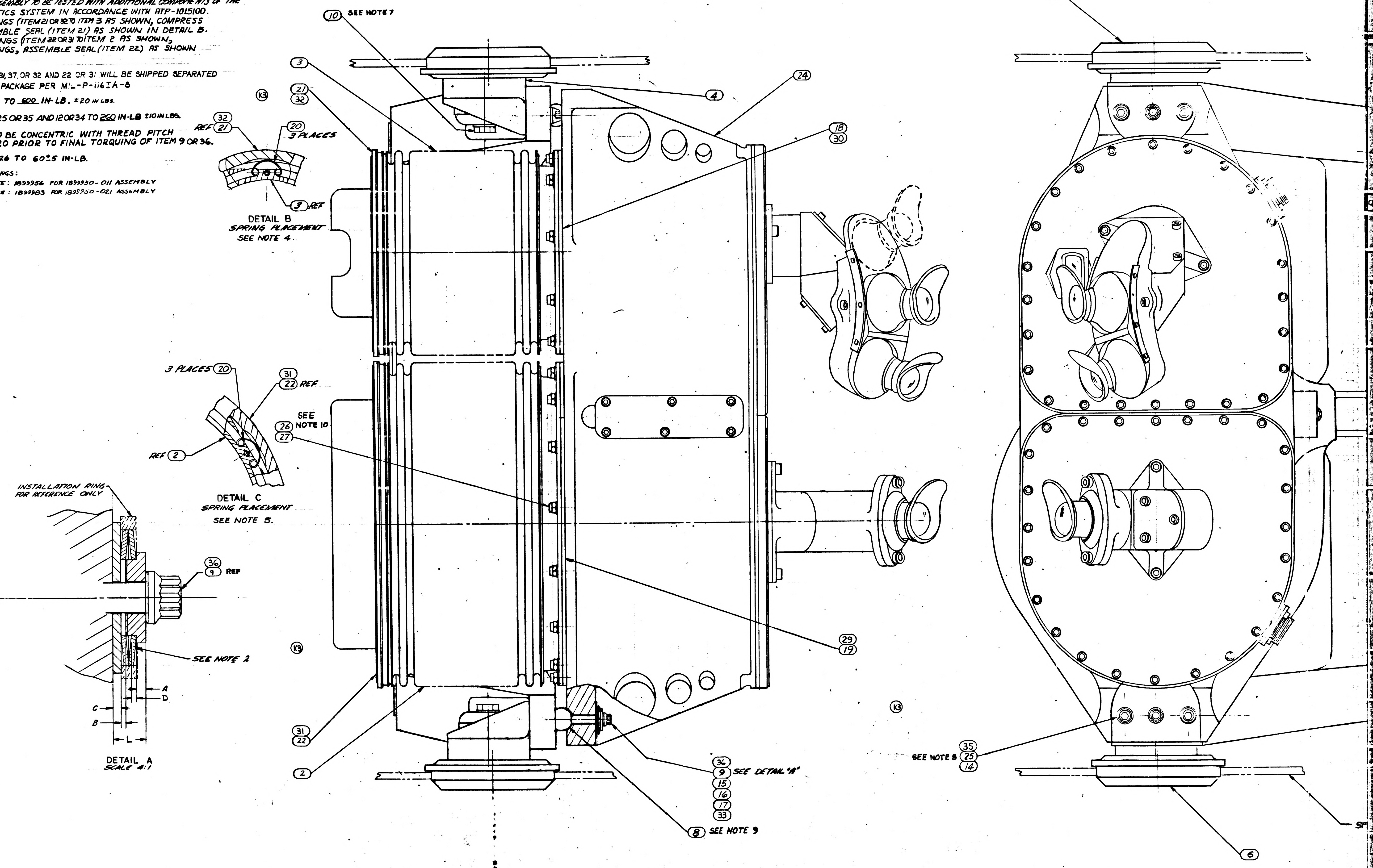
1899950 L

INCHES
PHOTOGRAPHIC SCALE ONLY

F-2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR ㊱ UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. R.P REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 21 OR 32 TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 22 OR 31 TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 23, 21, 37, OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116IA-8
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY



K3
10 SEE NOTE 7
3
21
32
4
24
18
30
23
REF 32 21
20 3 PLACES
9 REF
3 PLACES 20
31
22 REF
SEE NOTE 10
26
27
REF 2
INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L
29
19
31
22
2
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
SEE NOTE 8
35
25
14
6

DETAIL B
SPRING PLACEMENT
SEE NOTE 4

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.

DETAIL A
SCALE 4:1

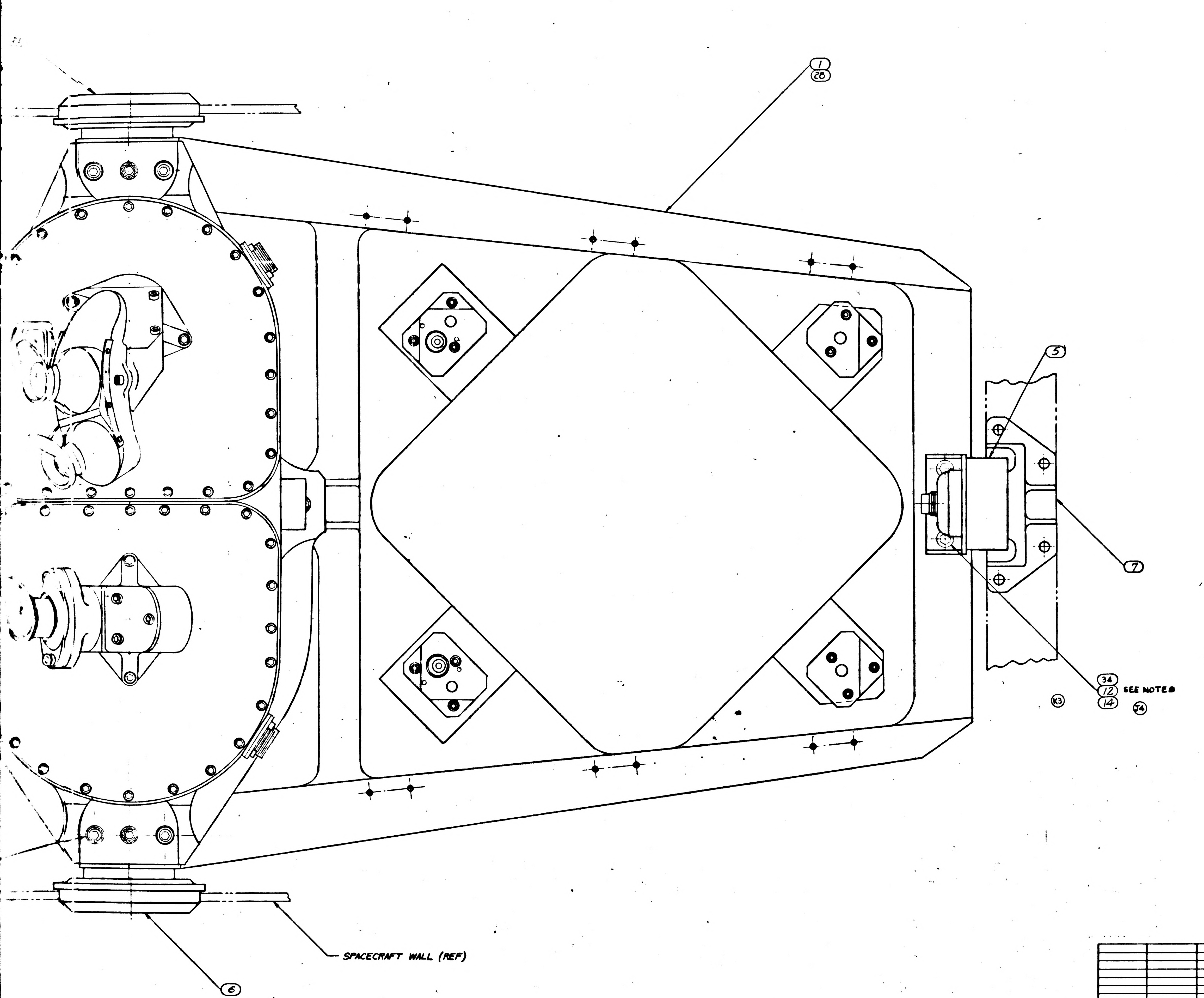
1899950 L

INCHES
PHOTOGRAPHIC SCALE ONLY

W 0966681

REVISIONS

	SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
(N)	E		REPLACES REV D R. WITH CHANGES TDRR 02307		[illegible]	WK
(4)	F		REVISED IN ACCORDANCE WITH TDRR 02513		[illegible] 63	RWG: [illegible]
(N)	G		REVISED PER TDRR NO. 03098			WK 9/16/63
(4)	H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
(M)	J6		REVISED PER TDRR NO. 04990		17 DEC 63	
	K9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
	L2		REVISED PER TDRR NO. 06742		0 MAR 64	WK
	M		REVISED PER TDRR NO. 07072		1 APR 64	JJJ



Ⓔ REPLACES REVISION D WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
(L)			1	1		37	1899999	SOLATOR LOCKOUT SET (NAV. BASE)
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
(K2)			3			33	1899984	CENTERING COLLAR
			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	
			1			30	1899996-001	
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
(J1)				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
(K1)				1		19	1899953-002	SEAL, BELLOWS
				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER-SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516	WASHER, FLAT
(J2)				2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS 21250-04028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
			1	1		6	1899974	SNUBBER, FRONT L.H (INSEP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			2	2		4	1899970	MOUNT, RESILIENT, FRONT
			1	1		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1		2	1899952	BELLOWS ASSEMBLY, SXT
				1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN DATE 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

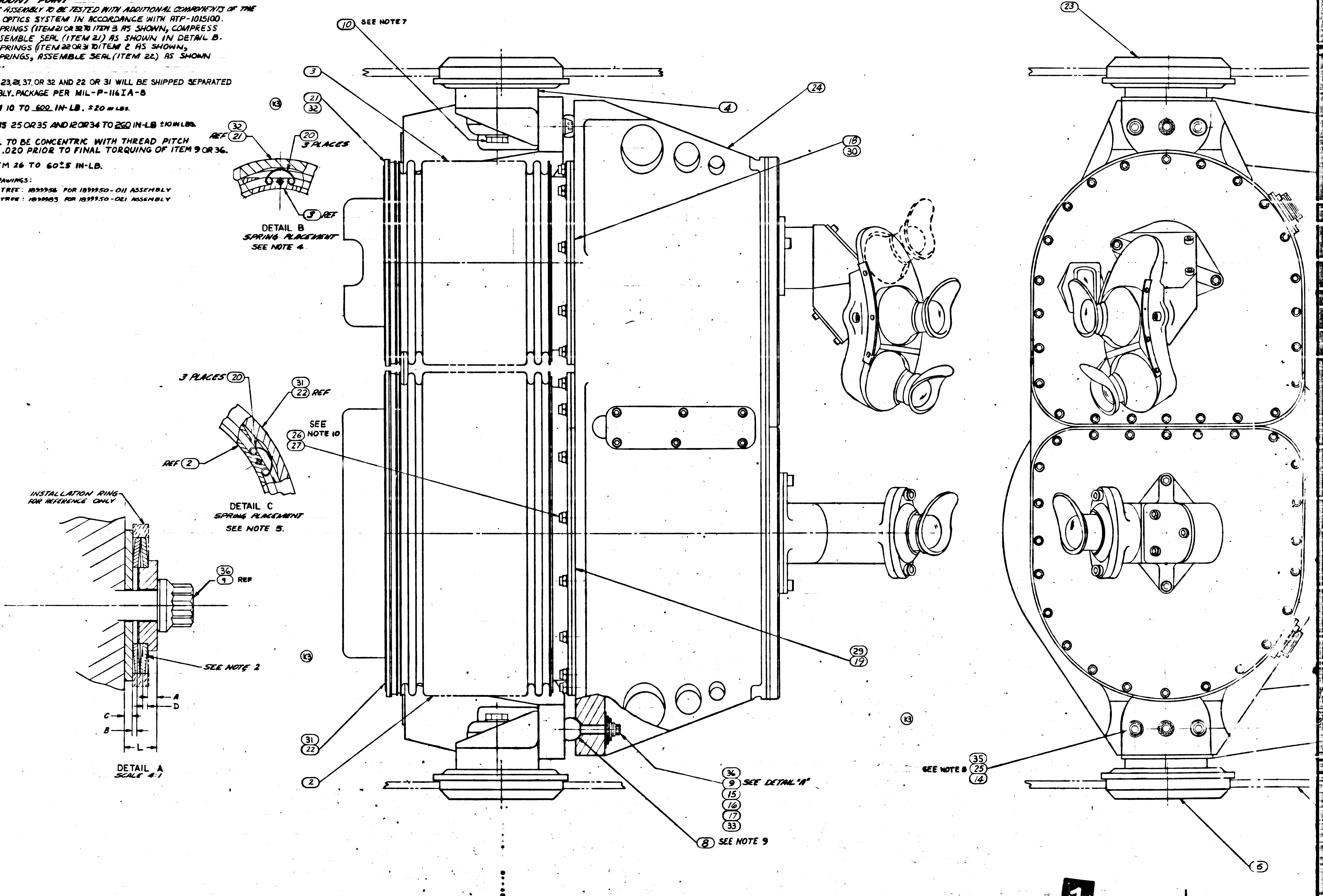
CODE IDENT NO. SIZE J 1899950
SCALE FULL SHEET OF 1

2

1899950 L

NOTES:

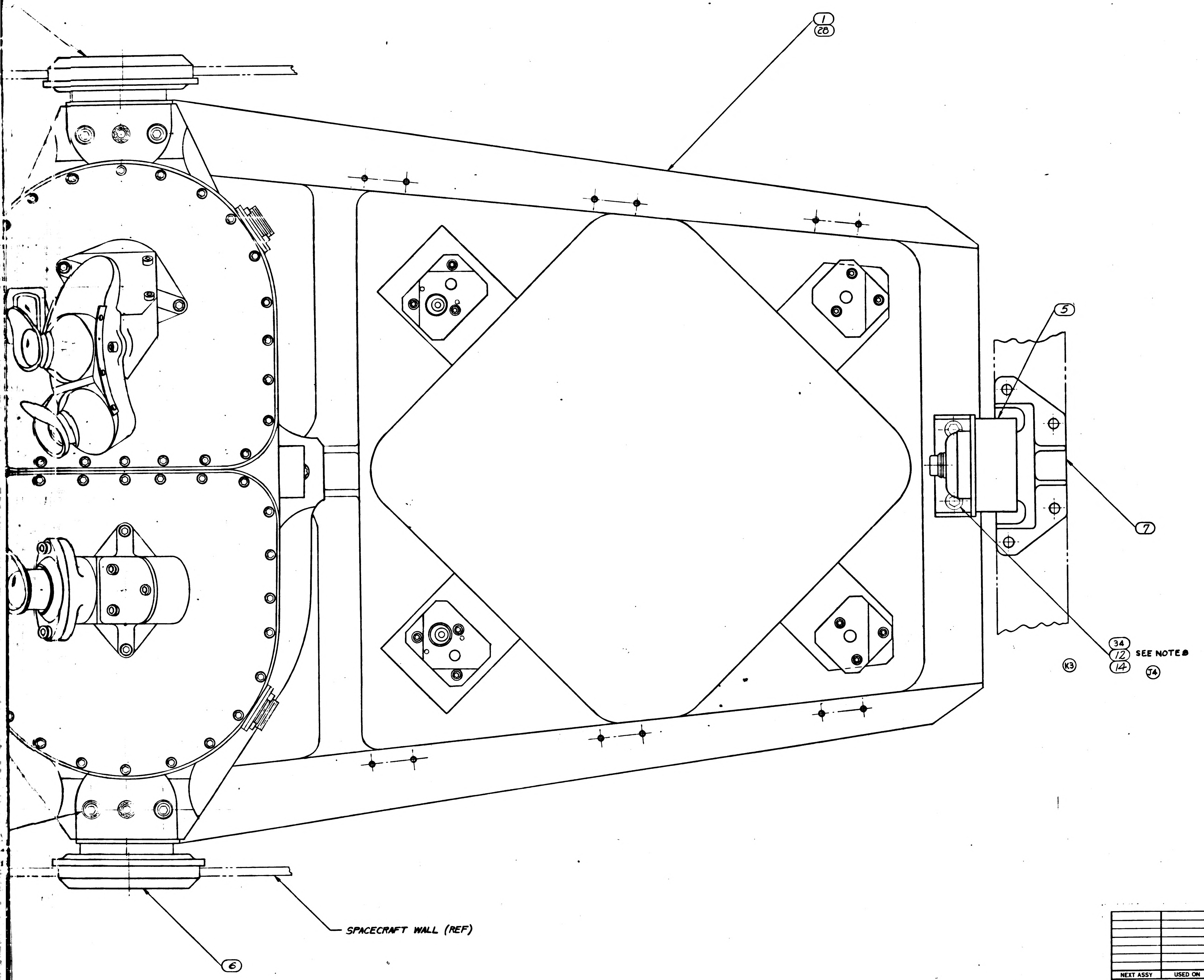
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR (36) UNTIL L=(A+B+C+D+.008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 21 OR 32 TO ITEM 3 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 21) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 22 OR 31 TO ITEM 2 AS SHOWN, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEM 22) AS SHOWN IN DETAIL C.
6. ITEMS 4, 6, 10, 23, 21, 37, OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY


J6
K4
K5
K6
K9
J5
L1
J3
K7
K8
K3
10 SEE NOTE 7
3
21
32
4
24
23
18
30
REF 32 21
20 3 PLACES
3 REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
3 PLACES 20
31
22 REF
SEE NOTE 10
26
27
REF 2
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
29
19
31
22
2
36
9 SEE DETAIL 'A'
15
16
17
33
8 SEE NOTE 9
SEE NOTE 8 35 25 14
6

1 | 1899950 L

N 0566681

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV. D WITH CHANGES TDRR 02307		3/4/63	WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		28 Aug 63	RWG
G2		REVISED PER TDRR NO. 03098			WK 9/16/63
H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J6		REVISED PER TDRR NO. 04990		17 DEC 63	
K9		REVISED PER TDRR NO. 06253		8 FEB 64	WK
L2		REVISED PER TDRR NO. 06742		0 MAR 64	WK
M		REVISED PER TDRR NO. 07072		APR 64	JJJ
N		REVISED PER TDRR 09654		11 JUN 64	MEM



Ⓔ REPLACES REVISION D WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
L2			1	1		37	1899999	ISOLATOR LOCKOUT SET (NAV. BASE)
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
			3			33	1899984	CENTERING COLLAR
K2			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	↓
			1			30	1899996-001	↓
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
J1				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
				1		19	1899953-002	SEAL, BELLOWS
K1				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER-SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516L	WASHER, FLAT
J2				2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS 21250-04028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
			1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			2	2		4	1899970.	MOUNT, RESILIENT, FRONT
			1	1		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1		2	1899952	BELLOWS ASSEMBLY, SXT
				1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET 1 OF 1

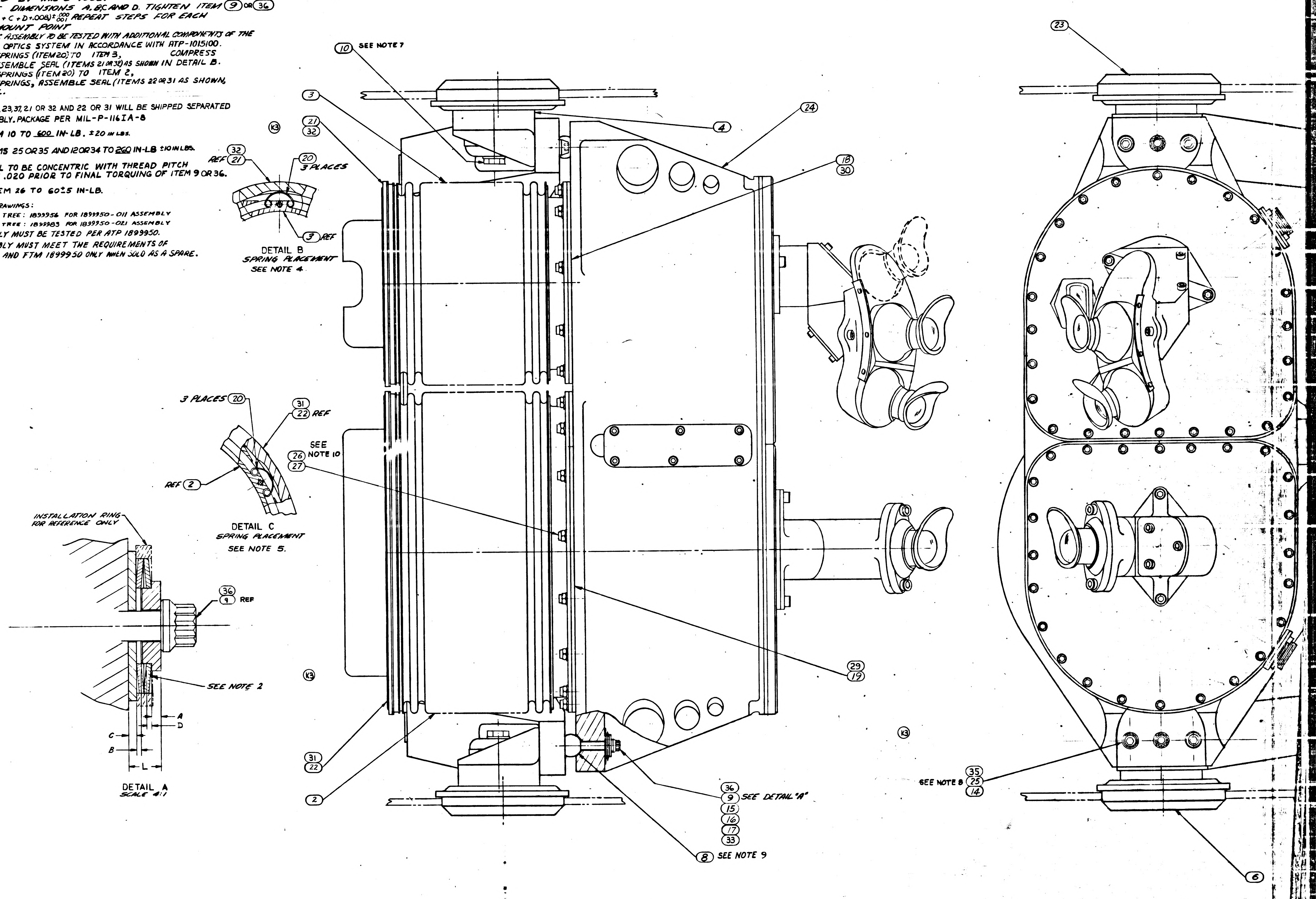
1899950 N

1899950 L

27/1899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR (36) UNTIL $L = (A + B + C + D + .008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT (J6) (K4)
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B. (K5)
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C. (K6)
6. ITEMS 4, 6, 10, 23, 37, 21 OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116IA-8 (K9) (J5) (L1)
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS. (J3)
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS. (K7)
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36. (K8)
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.


(32)
REF (21)
(20) 3 PLACES
(3) REF
3 PLACES (20)
(31)
(22) REF
REF (2)
INSTALLATION RING FOR REFERENCE ONLY
(36)
(9) REF
SEE NOTE 2
A
D
C
B
L
(10) SEE NOTE 7
(3)
(21)
(32)
(4)
(24)
(18)
(30)
(K3)
SEE NOTE 10
(26)
(27)
(29)
(19)
(31)
(22)
(2)
(36)
(9) SEE DETAIL "A"
(15)
(16)
(17)
(33)
(8) SEE NOTE 9
(23)
SEE NOTE 8 (35)
(25)
(14)
(6)

DETAIL B
SPRING PLACEMENT
SEE NOTE 4.

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.

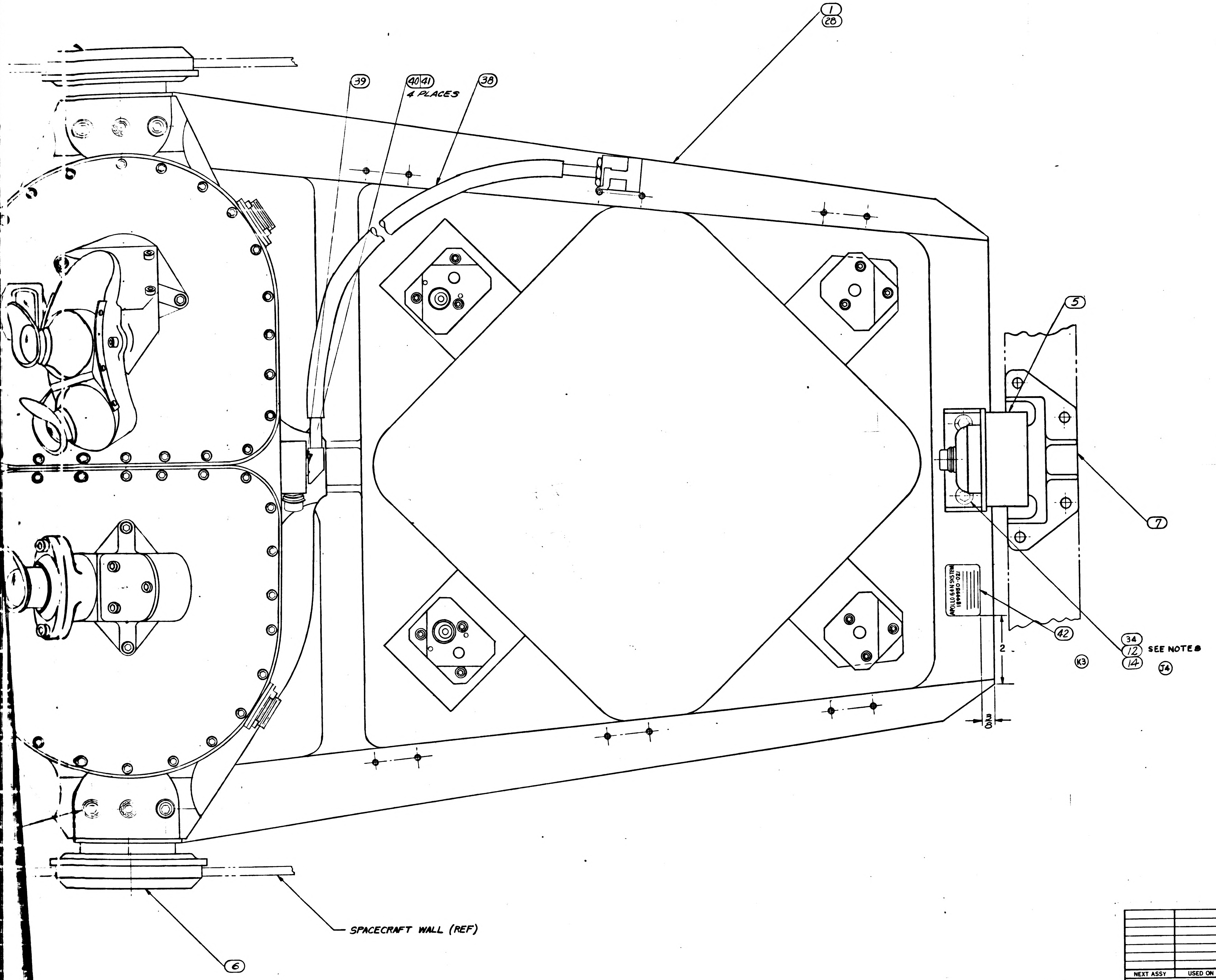
DETAIL A
SCALE 4:1

1899950 L

17 1899950

1899950 D

	SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
Ⓔ	E		REPLACES REV.D WITH CHANGES [illegible]		3/[illegible]/63	WK
Ⓕ	F		REVISED IN ACCORDANCE WITH TDRR 02513		29 Aug 63	RWG: [illegible]
	G_2		REVISED PER TDRR NO. 03098			WK 9/18/63
	H_2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
Ⓜ	J_6		REVISED PER TDRR NO. 04990		17 DEC 63	
	K_9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
	L_2		REVISED PER TDRR NO. 06742		6 MAR 64	WK
Ⓜ	M		REVISED PER TDRR NO. 07072		APR 64	JJJ
	N		REVISED PER TDRR 09654		11 Jun 64	[illegible]
	P		REVISED PER TDRR 11914		64	JNP



Ⓔ REPLACES REVISION D WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			42	1014650-9	PLATE, IDENTIFICATION
			4			41	1006997	WASHER, PLAIN FLAT
			4			40	NAS1352C06-8	SCREW-SOCKET HEAD CAP
			1			39	1011599-16	PACKING, PREFORMED
			1			38	1001471	HOSE FLEXIBLE ASSEMBLY
L_2			1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
			3			33	1899984	CENTERING COLLAR
K2			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	↓
			1			30	1899996-001	↓
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
J1				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
				1		19	1899953-002	SEAL, BELLOWS
K1				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER-SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516L	WASHER, FLAT
J2				2		12	NAS145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
			1	1		6	1899974	SNUBBER, FRONT [illegible] (INSEP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			2	2		4	1899970	MOUNT, RESILIENT, FRONT
			1	1		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1		2	1899952	BELLOWS ASSEMBLY, SXT
				1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS + — − —
ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

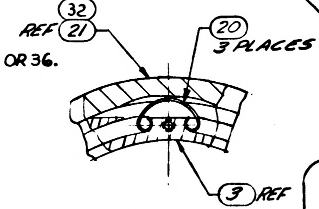
CODE IDENT NO.
SIZE J
1899950
SCALE FULL SEE NOTE 18
SHEET 1 OF 1

1899950

2718999950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM (9) OR (36) UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3. COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4, 6, 10, 23, 37, 21 OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116IA-8
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 60±5 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 TO 12±1 IN-LB.
15. THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10×10^{-6} STD CC/SEC OF HELIUM AT 77.5±.5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.
16. SERIALIZE PER ND 1002023.
17. ITEM 38 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS-6 OZ.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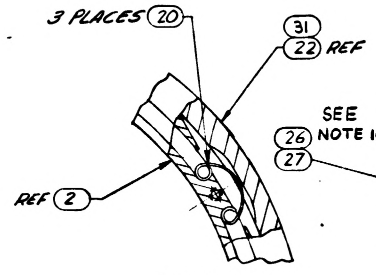
REF 21
20 3 PLACES
3 REF

DETAIL B
SPRING PLACEMENT
SEE NOTE 4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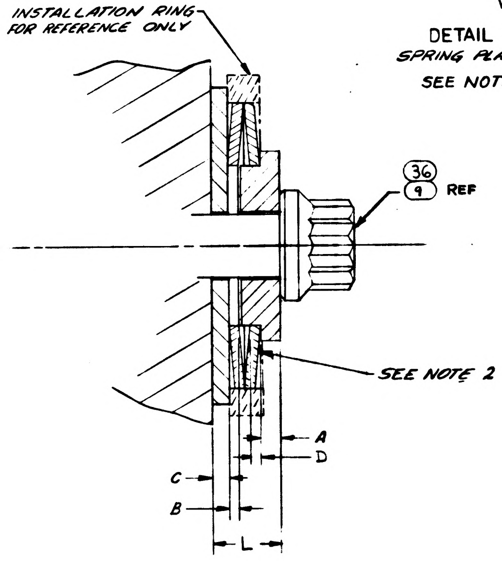
REF 2

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.


INSTALLATION RING FOR REFERENCE ONLY
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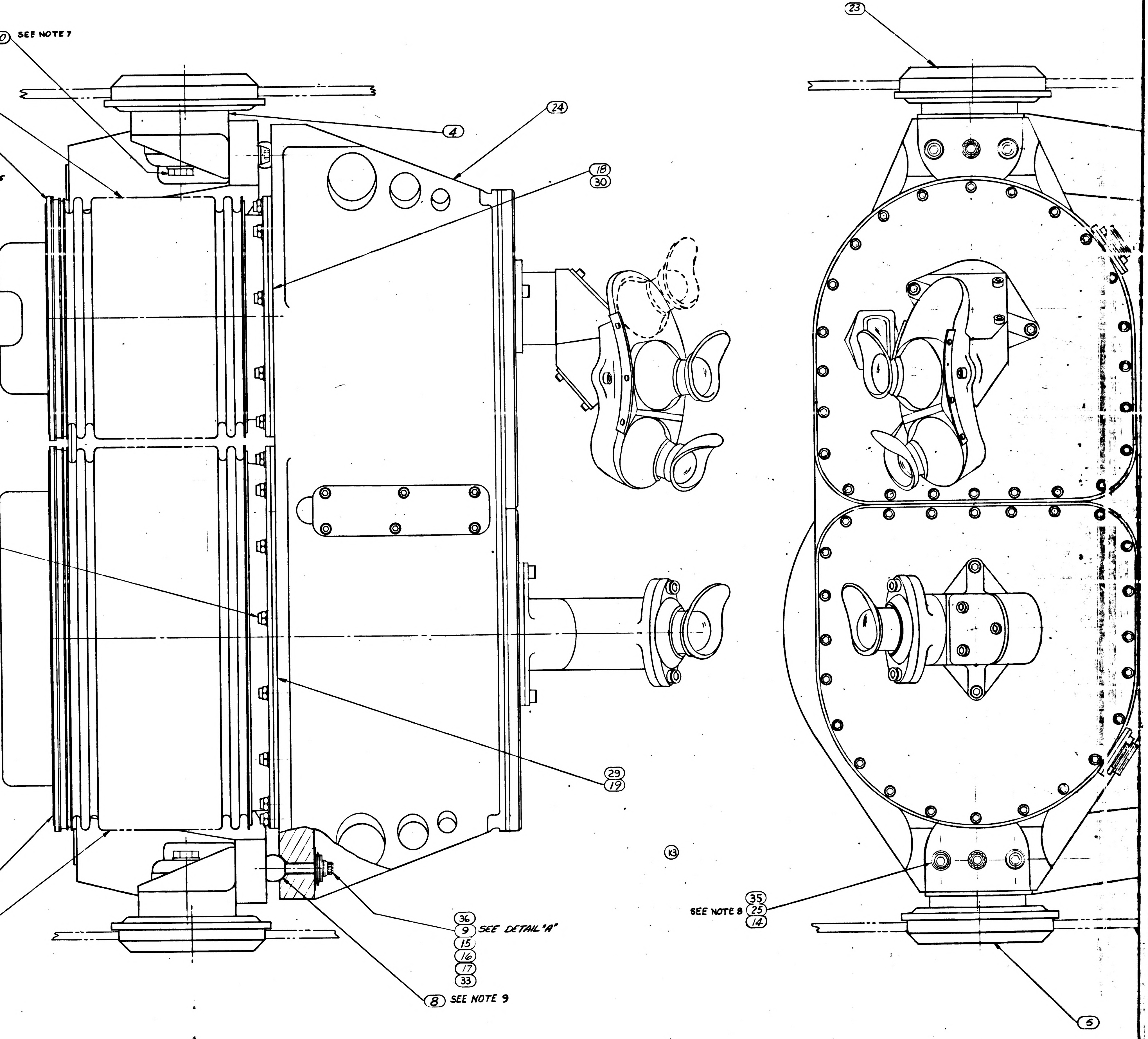
9 REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1


10 SEE NOTE 7
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32
K3
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23
SEE NOTE 10
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K3
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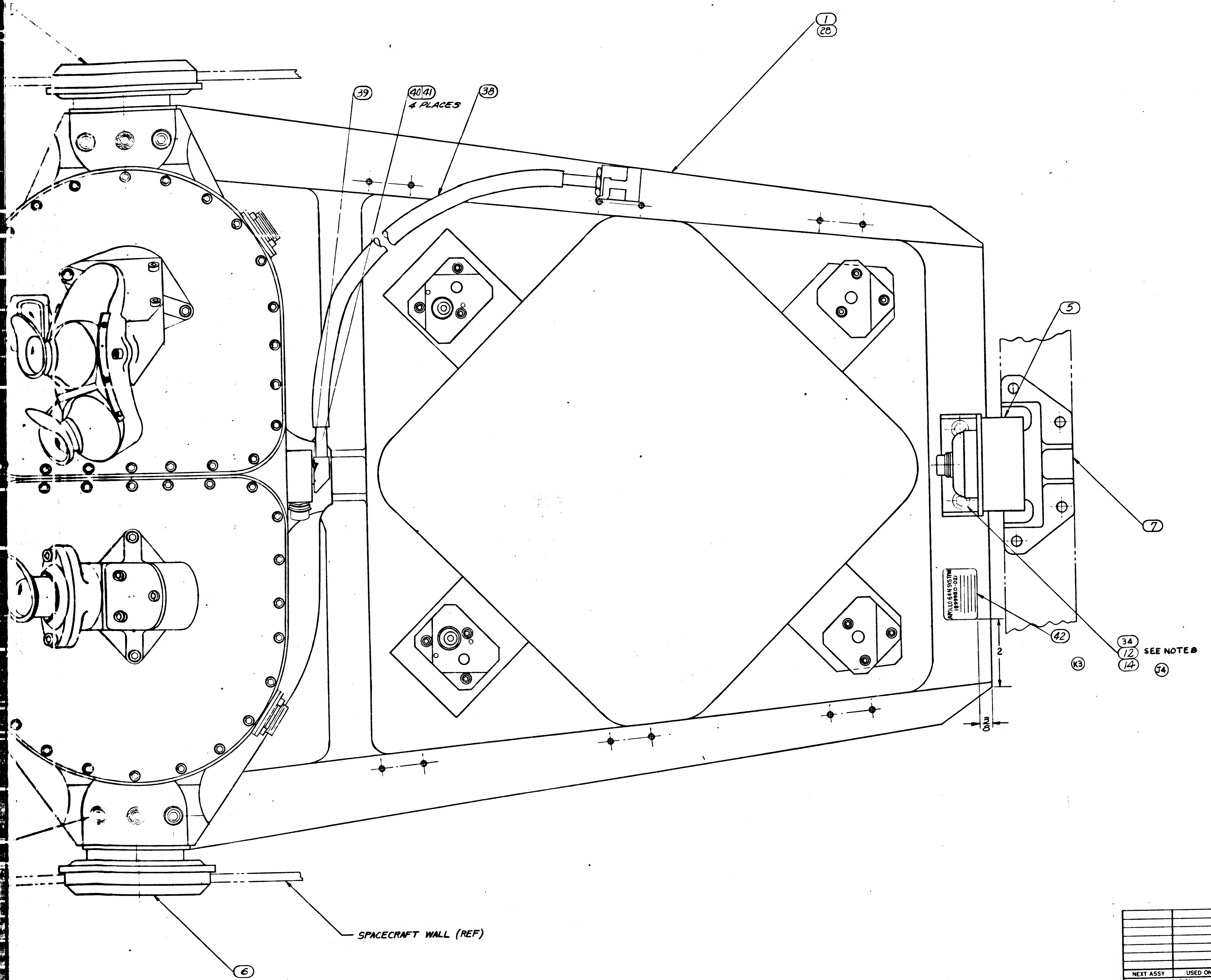
22
2
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
K3
SEE NOTE 8
35
25
14
5

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGES TDRR 02392		3 JUN 63	WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		28 AUG 63	RWG:
G2		REVISED PER TDRR NO. C3098			WK 9/16/63
H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J6		REVISED PER TDRR NO. 04990		17 DEC 63	
K9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L2		REVISED PER TDRR NO. 06742		10 MAR 64	WK
M		REVISED PER TDRR NO. 07072		1 APR 64	
N		REVISED PER TDRR 09654		11 JUN 64	MEN.
P		REVISED PER TDRR 11914		4 SEP 64	WHF
R		REVISED PER TDRR 12536		25 SEP 64	EL



Ⓔ REPLACES REVISION D WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			42	1014650-9	PLATE, IDENTIFICATION
			4			41	1006997	WASHER, PLAIN FLAT
			4			40	NAS1352C06-8	SCREW-SOCKET HEAD CAP
			1			39	1011599-16	PACKING, PREFORMED
			1			38	1001471	HOSE FLEXIBLE ASSEMBLY
L2			1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
			3			33	1899984	CENTERING COLLAR
K2			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	
			1			30	1899996-001	
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
J1				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
				1		19	1899953-002	SEAL, BELLOWS
K1				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER-SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516L	WASHER, FLAT
J2				2		12	NAS 145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
			1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			2	2		4	1899970	MOUNT, RESILIENT, FRONT
			1	1		3	1899951	BELLOWS ASSEMBLY SCT
			1	1		2	1899952	BELLOWS ASSEMBLY SXT
				1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

		DATE
DRAWN	F. KORACIN	11 APR 63
CHECKED	MALIKOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

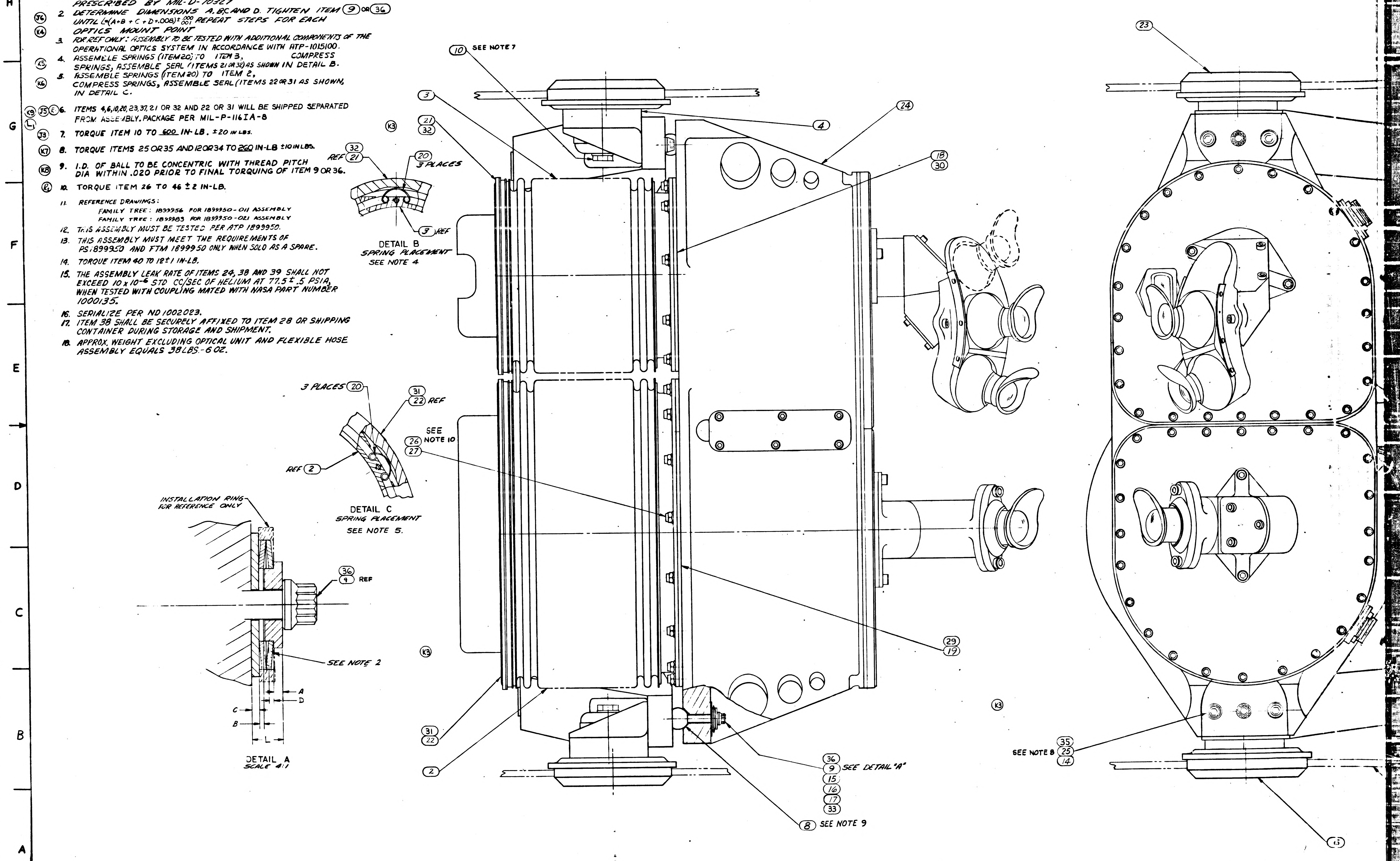
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

CODE IDENT NO. | SIZE J | 1899950
SCALE FULL | SEE NOTE 18 | SHEET 1 OF 1

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR (36) UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4,6,10,20,23,37,21 OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116IA-8
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 TO 12±1 IN-LB.
15. THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10×10^{-6} STD CC/SEC OF HELIUM AT 77.5±.5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.
16. SERIALIZE PER ND 1002023.
17. ITEM 38 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.


J6
K4
K5
K6
K9
J5
E
L1
J3
K7
K8
R1
K3
16
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G
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C
B
A
(10) SEE NOTE 7
(3)
(21)
(32)
(4)
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(18)
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(23)
(32)
REF (21)
(20)
3 PLACES
(3) REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
3 PLACES (20)
(31)
(22) REF
REF (2)
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
SEE NOTE 10
(26)
(27)
INSTALLATION RING FOR REFERENCE ONLY
(36)
(9) REF
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
(29)
(19)
(31)
(22)
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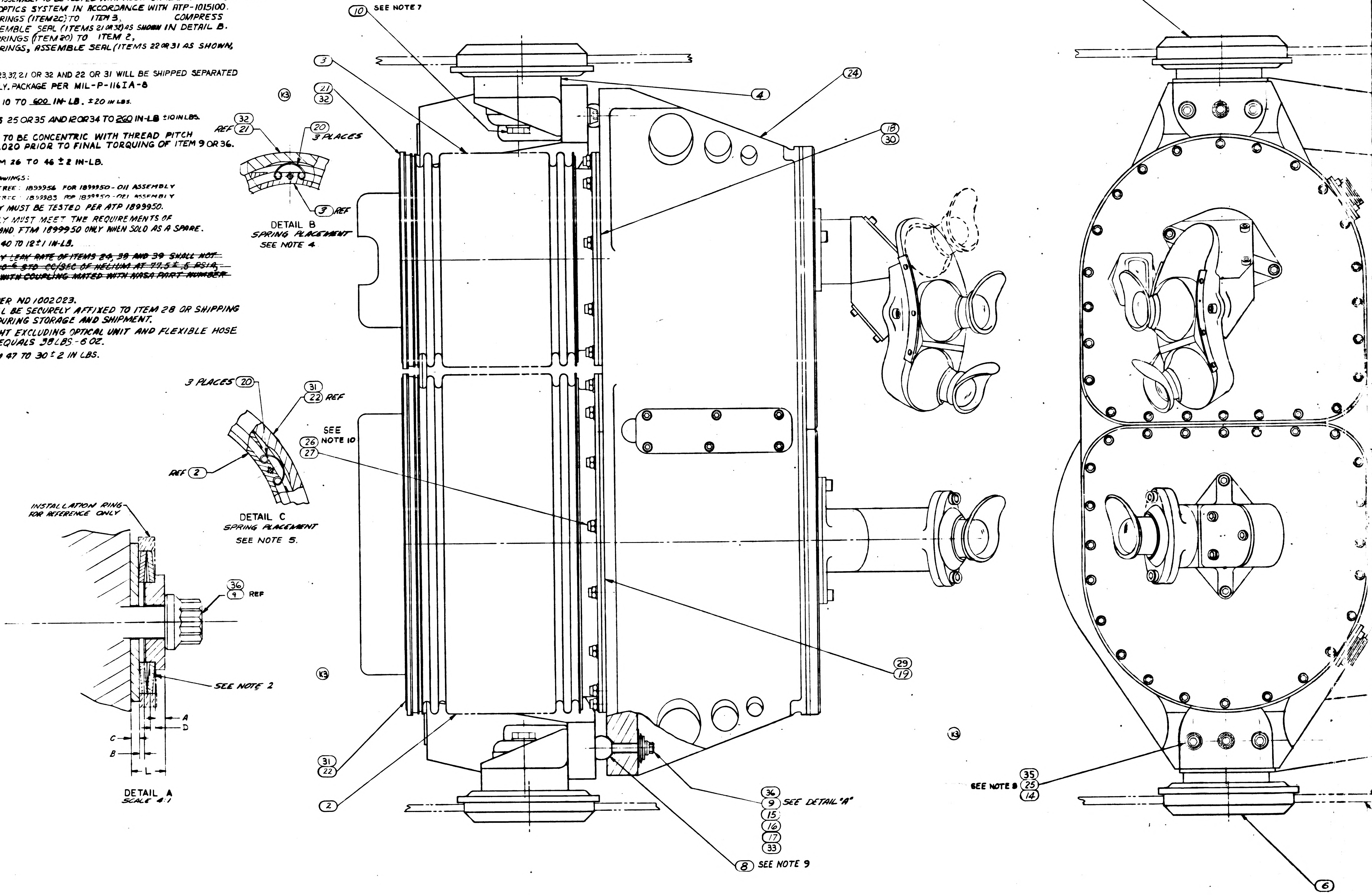
(36)
(9) SEE DETAIL "A"
(15)
(16)
(17)
(33)
(8) SEE NOTE 9
SEE NOTE 8
(35)
(25)
(14)
(6)

1/4899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM (9) OR (36) UNTIL L=(A+B+C+D+.008)$^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3. COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4, 6, 10, 20, 23, 37, 21 OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10^{-6} STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 38 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS - 6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.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K4
K5
K6
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J5
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J3
K7
K8
R1
K3
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4
24
23
18
30
REF 21
32
20 3 PLACES
3 REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
3 PLACES 20
31
22 REF
REF 2
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
SEE NOTE 10
26
27
29
19
INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
31
22
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36
9 SEE DETAIL "A"
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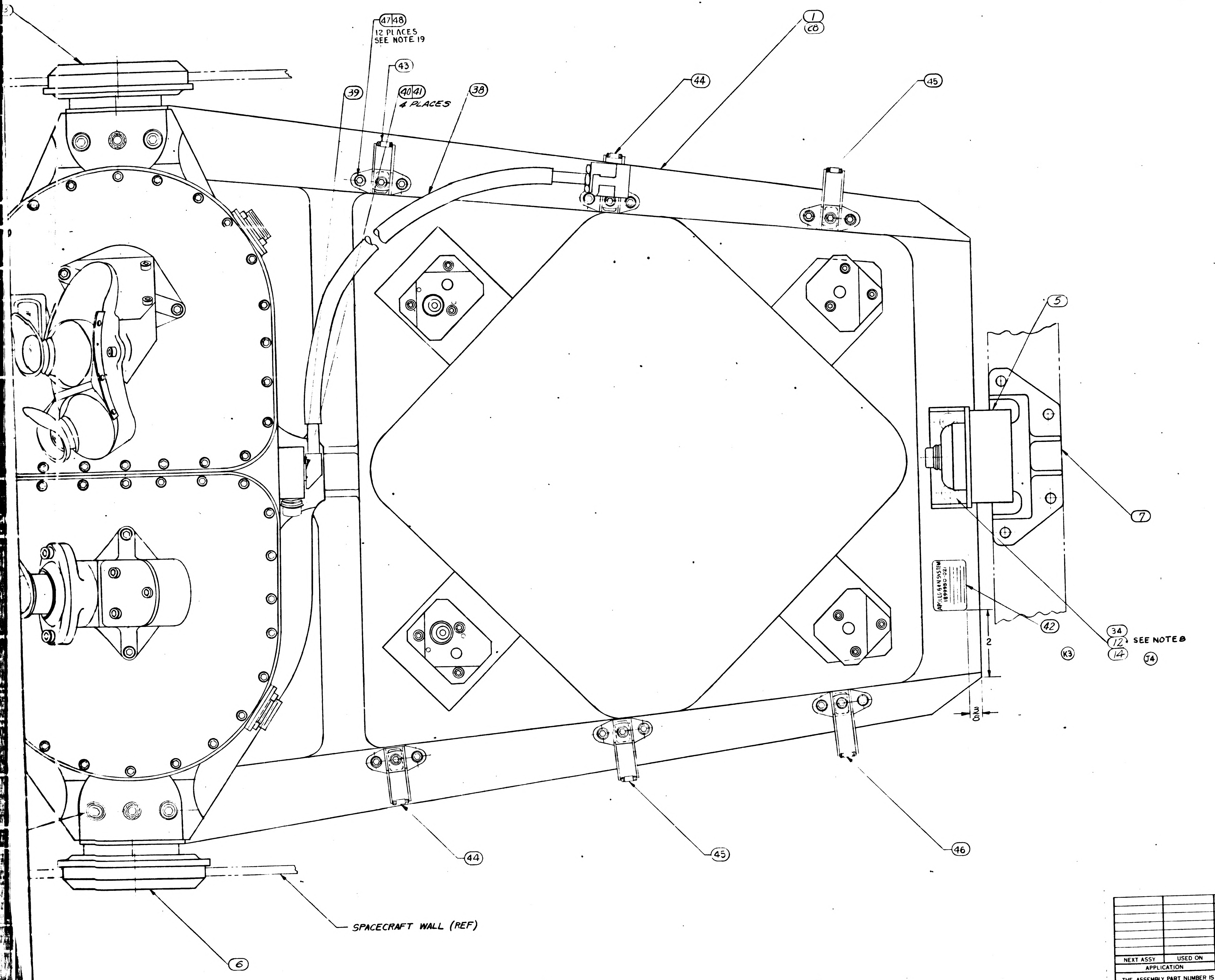
16
17
33
8 SEE NOTE 9
SEE NOTE 8 35
25
14
6

1899950

	SYM	ZONE	DESCRIPTION	CHG NO		APPD
Ⓜ	E		REPLACES REV D WITH CHANGES [illegible]			
Ⓜ	F		REVISED IN ACCORDANCE WITH TDRR 02513		[illegible] 63	RWG
Ⓜ	G2		REVISED PER TDRR NO. 03098			WK 9/19/63
Ⓜ	H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
Ⓜ	J6		REVISED PER TDRR NO. 04990		17 DEC. 63	
Ⓜ	K9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
	L2		REVISED PER TDRR NO. 06742		10 MAR 64	WK
Ⓜ	M		REVISED PER TDRR NO. 07072		1 APR 64	JJJ
Ⓜ	N		REVISED PER TDRR 09654		11 JUN 64	JWP MEM
Ⓜ	P		REVISED PER TDRR 11914		4 SEP 64	JWP DAS
Ⓜ	R1		REVISED PER TDRR 12536		25 SEP 64	EL CP
Ⓜ	S		REVISED PER TDRR 13157		16 OCT 64	JWP
Ⓜ	T		REVISED PER TDRR 13468		27 OCT 64	JJJ
	U		REVISED PER TDRR 14671		14 DEC 64	E



Ⓔ1 REPLACES REV D WITH CHANGE

			[illegible]	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			12	12		48	MS16214-4	WASHER-LOCK
			12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
			1	1		46	1010400-4	CLAMP, LOOP HINGED
			2	2		45	1010400-3	
			2	2		44	1010400-2	
			1	1		43	1010400-1	
			1			42	1014650-9	PLATE, IDENTIFICATION
			4			41	1006997	WASHER, PLAIN FLAT
			4			40	NAS1352C06-8	SCREW-SOCKET HEAD CAP
			1			39	1011599-16	PACKING, PREFORMED
			1			38	1001471	HOSE FLEXIBLE ASSEMBLY
Ⓛ2			1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
			3			36	1010732-014	BOLT, EXTERNAL WRENCHING
			4			35	1010727-001	BOLT, INTERNAL WRENCHING
			2			34	1010728-001	BOLT, EXTERNAL WRENCHING
			3			33	1899984	CENTERING COLLAR
Ⓚ2			1			32	1899997-001	SEAL, PLAIN ENCASED
			1			31	1899997-002	
			1			30	1899996-001	
			1			29	1899996-002	SEAL, PLAIN ENCASED
			1			28	1899982	FRAME ASS'Y, NAV. BASE
			24	24		27	AN960C-10L	WASHER, FLAT
			24	24		26	AN363C-1032	NUT, SELF LOCKING
Ⓙ1				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
			1	1		24	1011000	OPTICAL UNIT
			1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
			6	6		20	1899971	SPRING-SEAL RETAINING
				1		19	1899953-002	SEAL, BELLOWS
Ⓚ1				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
			6	6		16	1899979	WASHER-SPRING BELLEVILLE
			3	3		15	1899977	WASHER
			6	6		14	AN960C-516L	WASHER, FLAT
Ⓙ2				2		12	NAS145-11	BOLT - INTERNAL WRENCHING
			3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
			3	3		8	1899967	BALL, PRECISION
			1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
			1	1		6	1899974	SNUBBER, FRONT L.H (INSEP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			1	1		4	1899970	MOUNT, RESILIENT, FRONT
			2	2		3	1899951	BELLOWS ASSEMBLY, SCT
			1	1		2	1899952	BELLOWS ASSEMBLY, SXT
				1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN

		DATE
DRAWN	F. KORACIN	11 APR 63
CHECKED	MALINOWSKI	12 APR 63
APPROVAL	J. HANN	12 APR 63
APPROVAL	A. KODEL	12 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

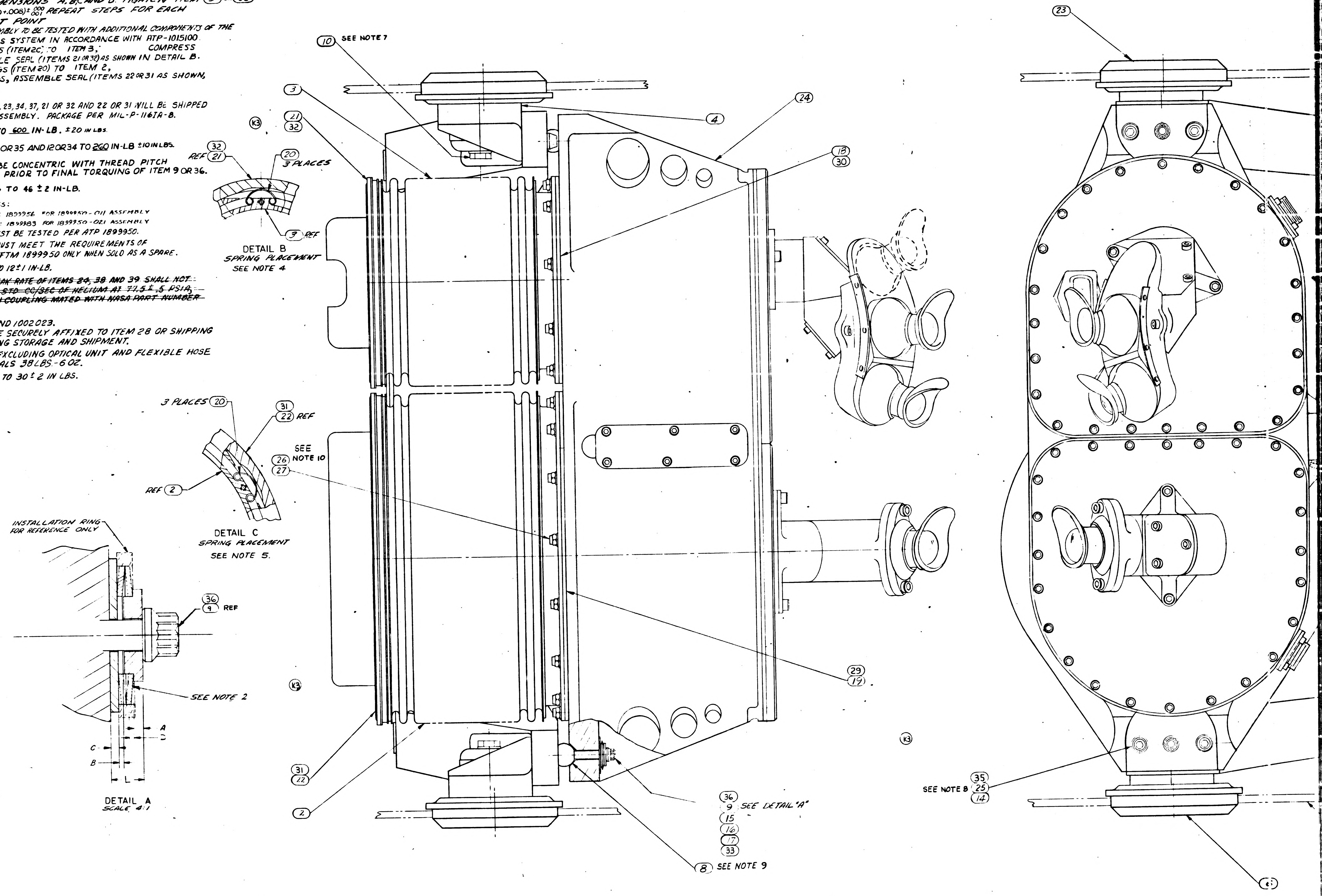
NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

CODE IDENT NO — SIZE J — 1899950
SCALE FULL — SEE NOTE 18 — SHEET 1 OF 1

1899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM (9) OR (36) UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT (J6) (K4)
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. (K5) ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. (K6) ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. (K9) (J5) (R1) (U1) (L1) ITEMS 4, 5, 6, 7, 10, 20, 23, 34, 37, 21 OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116IA-8.
7. (J3) TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. (K7) TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. (K8) I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. (R2) TORQUE ITEM 26 TO 46 ±2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 TO 12±1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 38 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
9. TORQUE ITEM 47 TO 30 ± 2 IN LBS.


10 SEE NOTE 7
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K3
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3 REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
3 PLACES 20
31
22 REF
SEE NOTE 10
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27
REF 2
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
K3
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K3
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SEE NOTE 8
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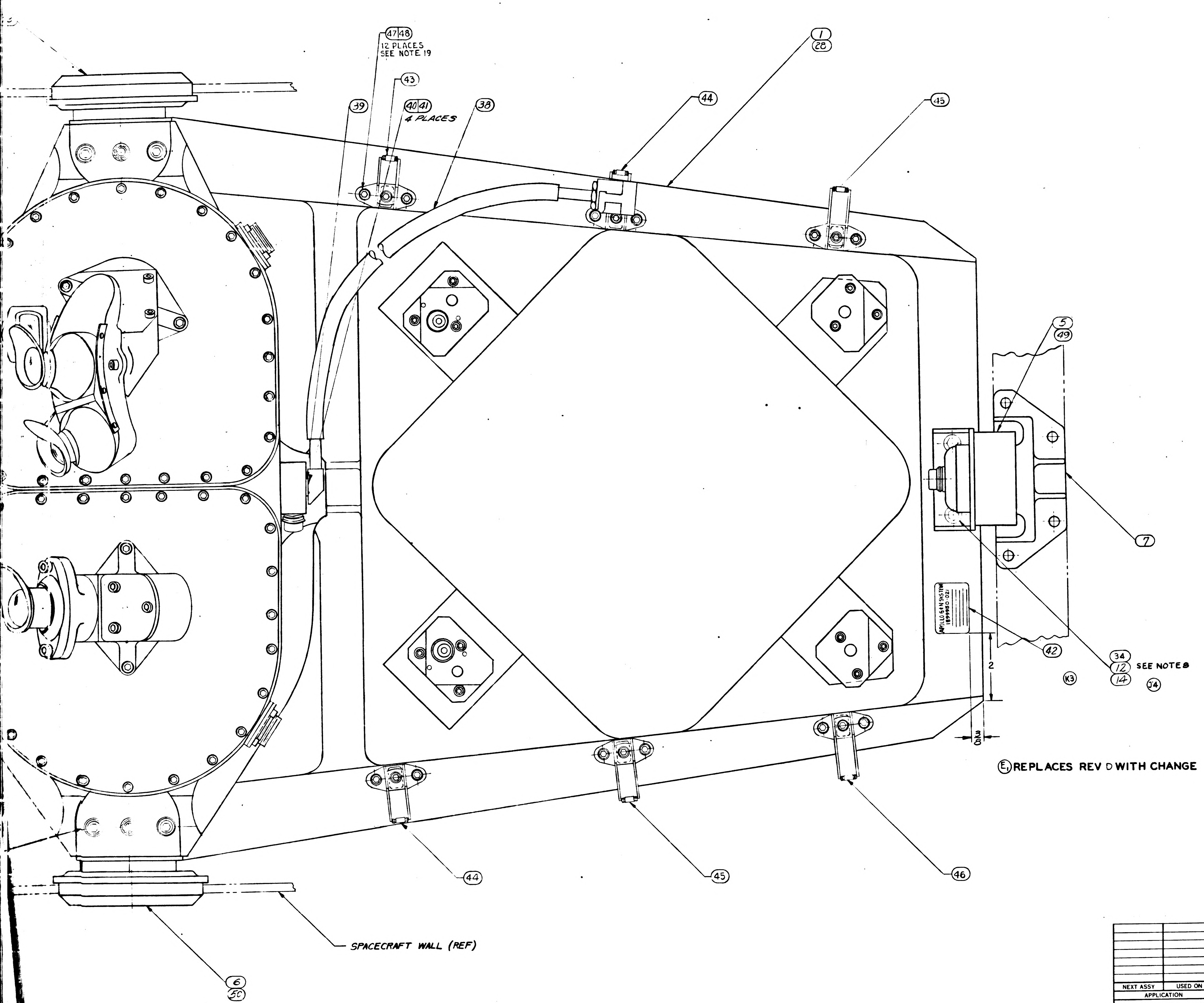
3H

1899950

1/1899950



Ⓔ REPLACES REV D WITH CHANGE

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		REPLACES REV D WITH CHANGE [illegible]		[illegible]	WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		[illegible] 63	RWG
G2		REVISED PER TDRR NO. 03098			WK
H2		REVISED PER TDRR NO. 03668		21 OCT 63	WK
J6		REVISED PER TDRR NO. 04990		17 DEC 63	
K9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L2		REVISED PER TDRR NO. 06742		6 MAR 64	WK
M		REVISED PER TDRR NO. 07072		1 APR 64	
N		REVISED PER TDRR 09654		11 JUN 64	MEM
P		REVISED PER TDRR 11914		4 SEP 64	JWP
R1		REVISED PER TDRR 12536		25 SEP 64	
S		REVISED PER TDRR 13157		16 OCT 64	JWP
T		REVISED PER TDRR 13468		27 OCT 64	
U		REVISED PER TDRR 14671		14 DEC 64	
V		REVISED PER TDRR 14672		17 DEC 64	JWP

041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1					52	2011000	OPTICAL UNIT
1					51	1338952	BELLOWS ASSEMBLY SXT
2	2				50	1010828	MOUNT, RESILIENT, FRONT
1	1				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12		48	MS16214-4	WASHER-LOCK
12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
1	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
2	2	2	2		45	1010400-3	
2	2	2	2		44	1010400-2	
1	1	1	1		43	1010400-1	
1	1	1			42	1014650-9	PLATE, IDENTIFICATION
4	4	4			41	1006997	WASHER, PLAIN FLAT
4	4	4			40	NAS1352C06-8	SCREW-SOCKET HEAD CAP
1	1	1			39	1011599-16	PACKING, PREFORMED
1	1	1			38	1001471	HOSE FLEXIBLE ASSEMBLY
1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3			33	1899984	CENTERING COLLAR
1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1			31	1899997-002	
1	1	1			30	1899996-001	
1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
			4		25	MS20005-12	BOLT, INTERNAL WRENCHING
	1	1	1		24	1011000	OPTICAL UNIT
1	1	1	1		23	1899978	SNUBBER. FRONT R.H. (INSEP) ASSY
			1		22	1899954-002	SEAL, BELLOWS
			1		21	1899954-001	SEAL, BELLOWS
6	6	6	6		20	1899971	SPRING-SEAL RETAINING
			1		19	1899953-002	SEAL, BELLOWS
			1		18	1899953-001	SEAL, BELLOWS
			3		17	1899976	COLLAR, CENTERING
6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3		15	1899977	WASHER
6	6	6	6		14	AN960C-516L	WASHER, FLAT
			2		12	NAS145-11	BOLT - INTERNAL WRENCHING
3	3	3	3		10	1899980	BOLT-HEX HEAD
			3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
			1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED
LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

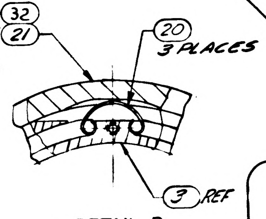
CODE IDENT NO. | SIZE J | 1899950
SCALE FULL | SHEET [illegible]

1899950

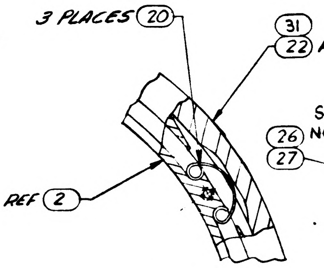
27-1899950

NOTES:

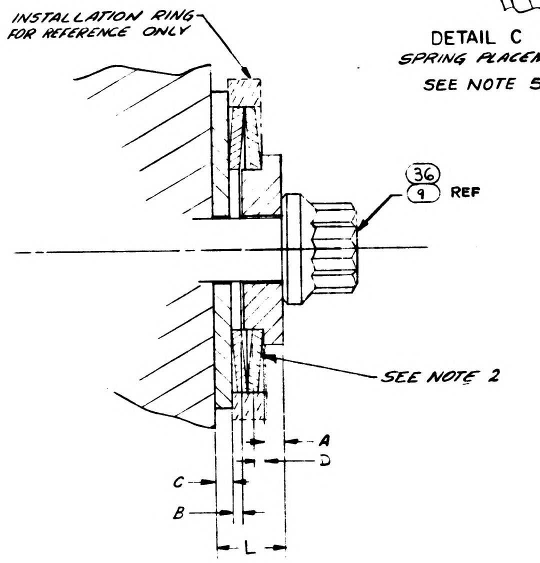
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM (9) OR (36) UNTIL $L=(A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT (J6) (K4)
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. (K5) ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. (K6) ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. (K9) (J5) (U1) (L1) ITEMS 6, 5 OR 49, 4 OR 50, 7, 10, 20, 23, 37, 21 OR 32 AND 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116IH-8.
7. (J3) TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. (K7) TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. (K8) I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. (R2) TORQUE ITEM 26 TO 46 ±2 IN-LB.
11. REFERENCE DRAWINGS:
    - FAMILY TREE. 1899956 FOR 1899950-011 ASSEMBLY
    - FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 TO 12±1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 38 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ±2 IN LBS.


32
REF 21
20
3 PLACES
3 REF

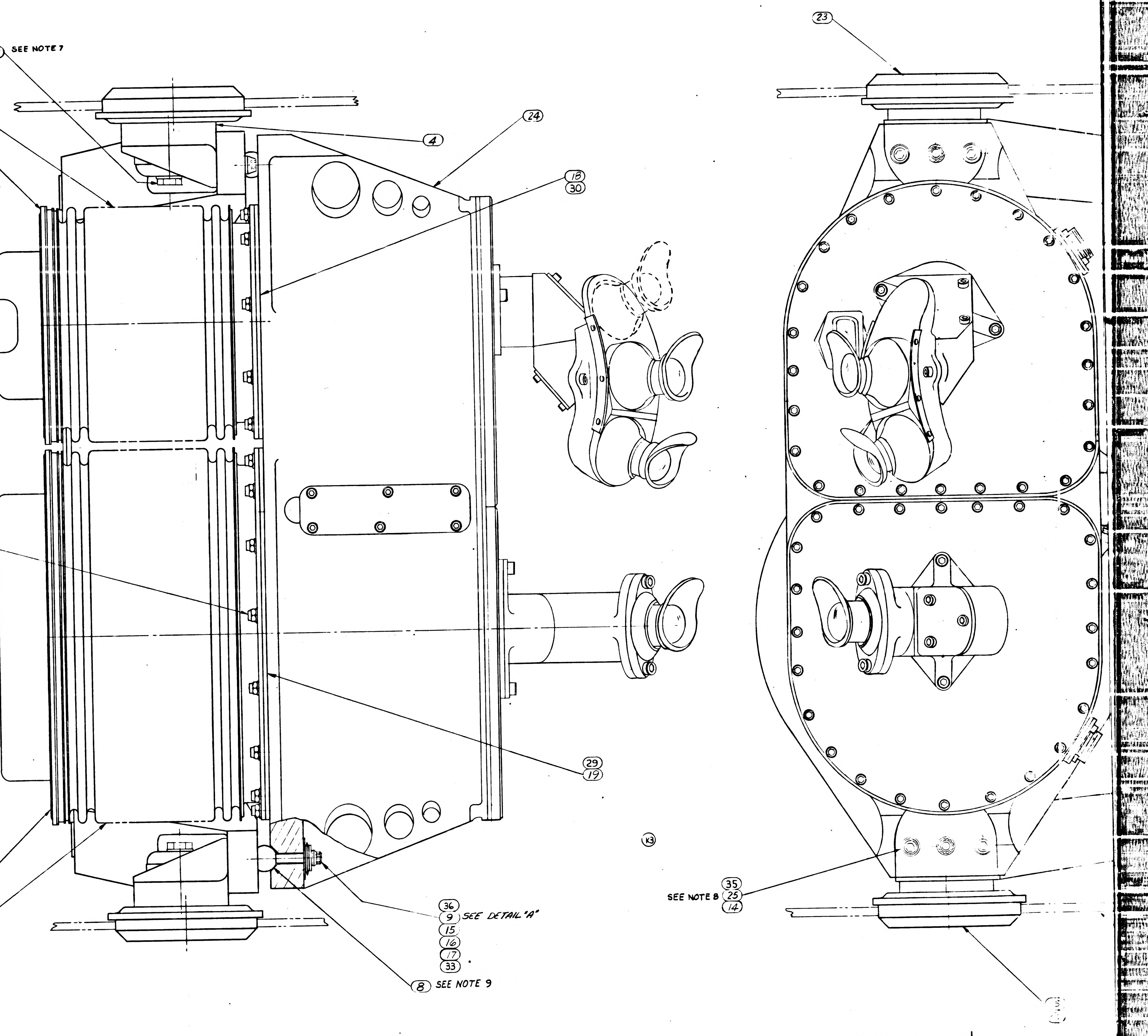
DETAIL B
SPRING PLACEMENT
SEE NOTE 4


3 PLACES 20
31
22 REF
REF 2

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.


INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L

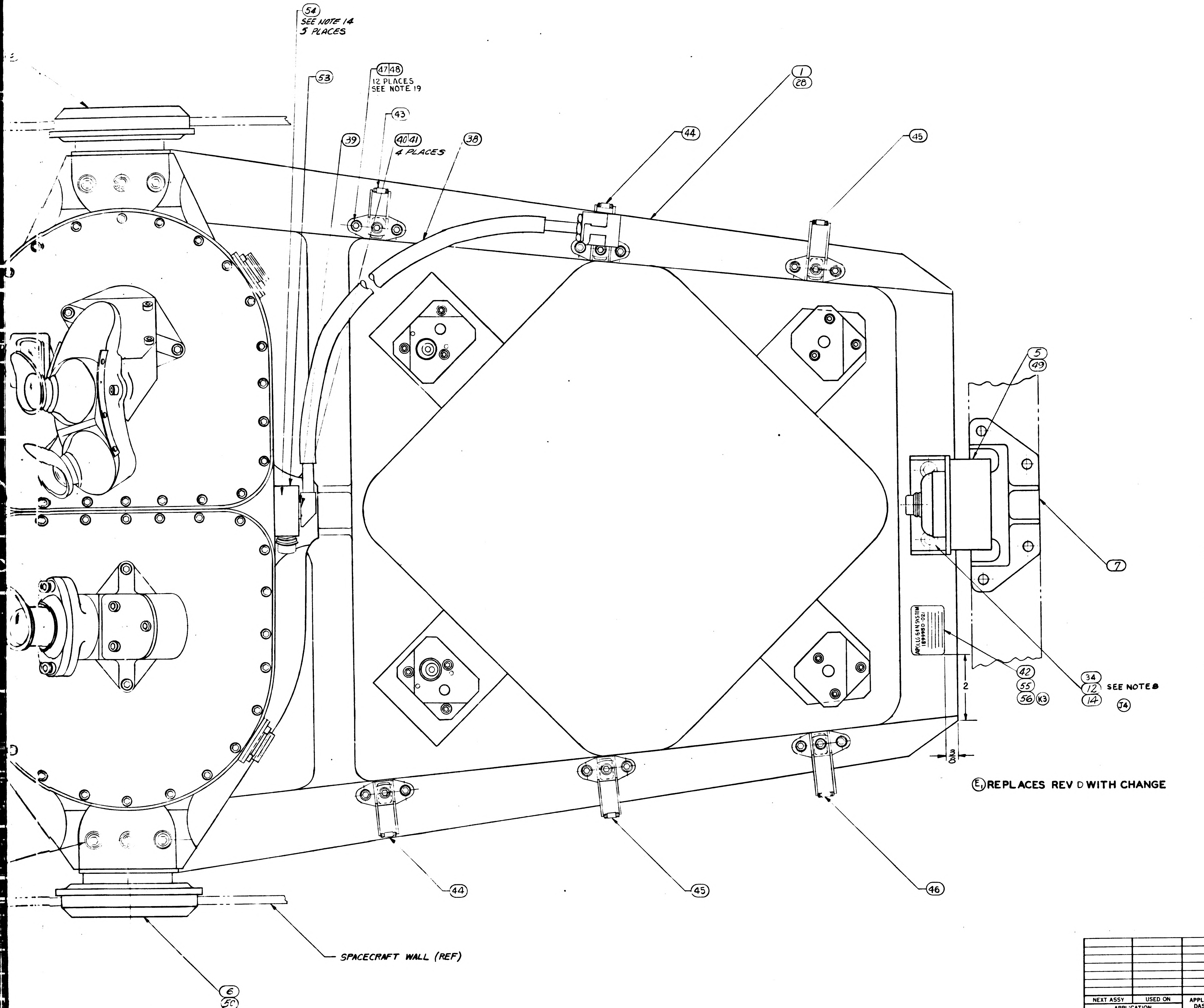
DETAIL A
SCALE 4:1


10 SEE NOTE 7
3
21
32
K3
4
24
18
30
23
SEE NOTE 10
26
27
29
19
K3
31
22
2
51
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
SEE NOTE 8 35
25
14
K3

1899950

1/1899950

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
E		REPLACES REV D WITH CHANGE			
F		REVISED IN ACCORDANCE WITH TDRR 02513		28 AUG 63	RWG
G2		REVISED PER TDRR NO. 03098			9/18/63
H2		REVISED PER TDRR NO. 03668		21 OCT 63	
J6		REVISED PER TDRR NO. 04990		DEC 63	
K9		REVISED PER TDRR NO. 06253		18 FEB 64	
L2		REVISED PER TDRR NO. 06742		10 MAR 64	
M		REVISED PER TDRR NO. 07072		1 APR 64	
N		REVISED PER TDRR 09654		11 JUN 64	MEM
P		REVISED PER TDRR 11914		4 SEP 64	JNP
R1		REVISED PER TDRR 12536		25 SEP 64	
S		REVISED PER TDRR 13157		16 OCT 64	
T		REVISED PER TDRR 13468		OCT 64	
U		REVISED PER TDRR 467		4 DEC 64	
V		REVISED PER TDRR 14672		7 DEC 64	
W		REVISED PER TDRR 16672		25 65	DAS



(E) REPLACES REV D WITH CHANGE

041	031	021	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1					56	1014650-18	PLATE, IDENTIFICATION
	1				55	1014650-17	PLATE, IDENTIFICATION
5					54	1011625-39	SCREW-SOCKET HEAD, CAP
1					53	1021407	ADAPTER PLATE ASS'Y COOL. HOSE SYP
1					52	2011000	OPTICAL UNIT
1					51	1338952	BELLOWS ASSEMBLY SXT
2	2				50	1010828	MOUNT, RESILIENT, FRONT
1	1				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12		48	MS16214-4	WASHER-LOCK
12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
1	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
2	2	2	2		45	1010400-3	↓
2	2	2	2		44	1010400-2	↓
1	1	1	1		43	1010400-1	↓
≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
≠	4	4			41	1006997	WASHER, PLAIN FLAT
≠	4	4			40	NAS1352C06-8	SCREW-SOCKET HEAD CAP
≠	1	1			39	1011599-16	PACKING, PREFORMED
≠	1	1			38	1001471	HOSE FLEXIBLE ASSEMBLY
1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3			33	1899984	CENTERING COLLAR
1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1			31	1899997-002	↓
1	1	1			30	1899996-001	↓
1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
			4		25	MS20005-12	BOLT, INTERNAL WRENCHING
	1	1	1		24	1011000	OPTICAL UNIT
1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
			1		22	1899954-002	SEAL, BELLOWS
			1		21	1899954-001	SEAL, BELLOWS
6	6	6	6		20	1899971	SPRING-SEAL RETAINING
			1		19	1899953-002	SEAL, BELLOWS
			1		18	1899953-001	SEAL, BELLOWS
			3		17	1899976	COLLAR, CENTERING
6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3		15	1899977	WASHER
6	6	6	6		14	AN960C-516L	WASHER, FLAT
			2		12	NAS145-11	BOLT - INTERNAL WRENCHING
3	3	3	3		10	1899980	BOLT-HEX HEAD
			3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
	1	1	1		2	1899952	BELLOWS ASSEMBLY SXT
			1		1	1899966	FRAME ASSY-NAVIGATION BASE
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS + — − —
ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

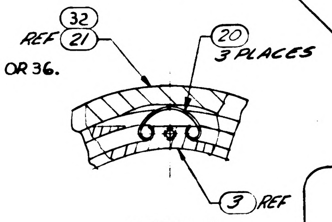
CODE IDENT NO.
SIZE J
1899950
SCALE FULL
SHEET

1899950 REV SH

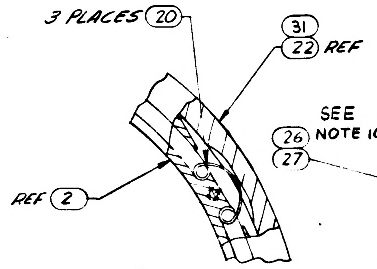
27 1899950

NOTES:

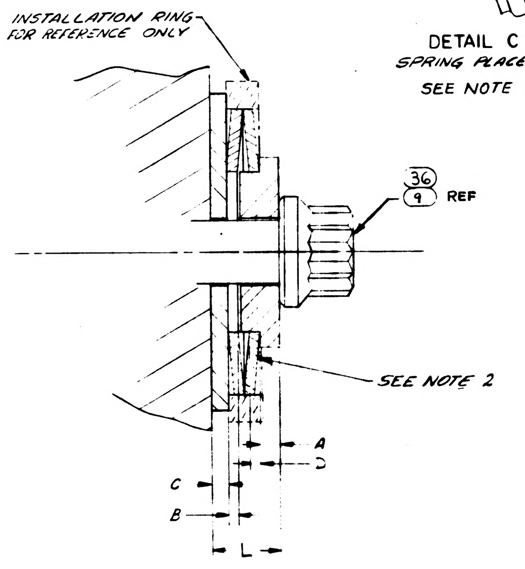
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM (9) OR (36) UNTIL $L = (A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT (J6) (K4)
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B. (K5)
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C. (K6)
6. ITEMS 6, 5 OR 49, 4 OR 50, 7, 10, 12 OR 34, 20, 23, 37, 21 OR 32, & 22 OR 31 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116IH-B. (K9) (J5) (L1)
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS. (J3)
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS. (K7)
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36. (K8)
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB. (R1)
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ±1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10-6 STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 38 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.


(32)
REF (21)
(20)
3 PLACES
(3) REF
(K3)

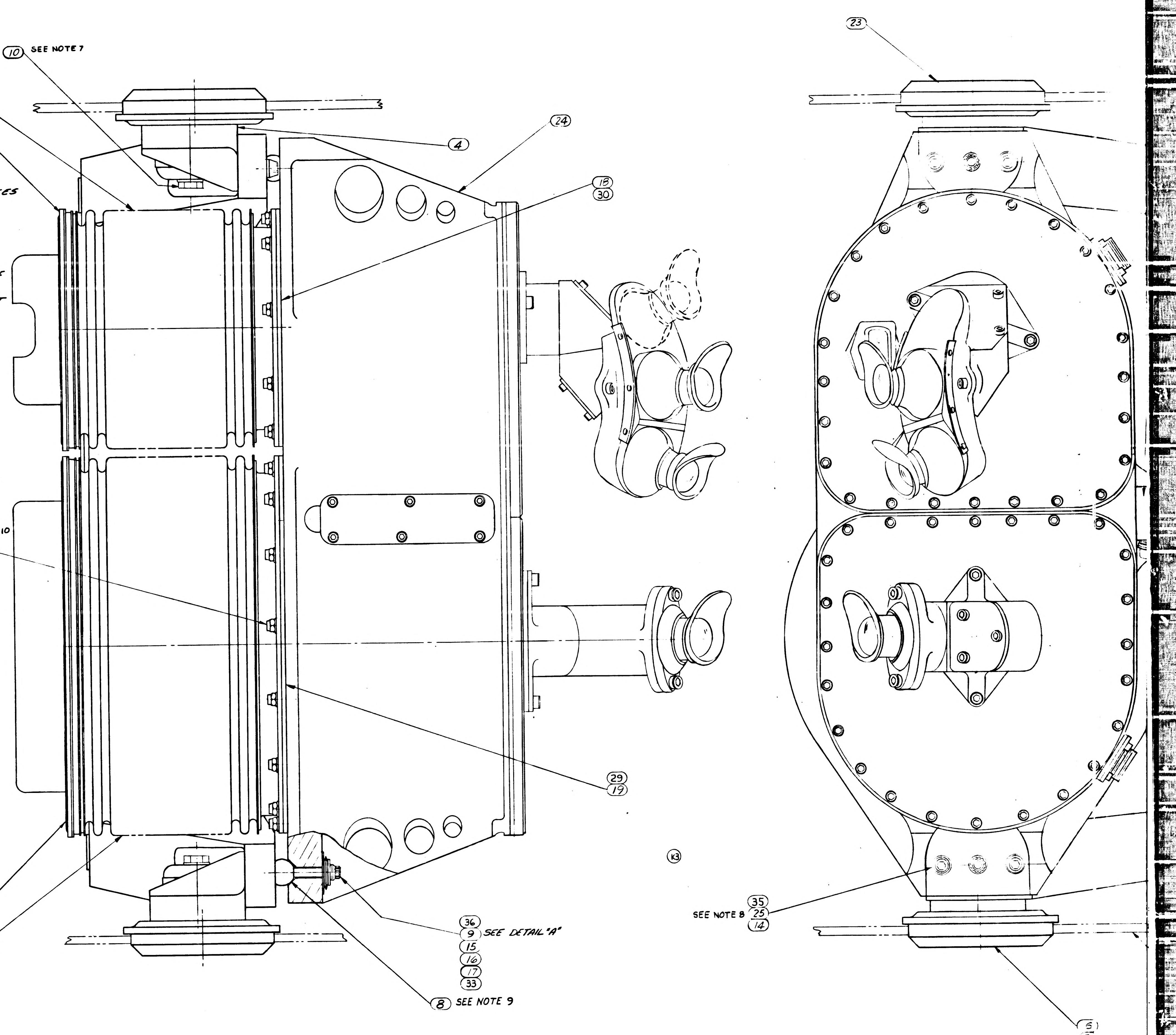
DETAIL B
SPRING PLACEMENT
SEE NOTE 4


3 PLACES (20)
(31)
(22) REF
REF (2)

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.


INSTALLATION RING FOR REFERENCE ONLY
(36)
(9) REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1


(10) SEE NOTE 7
(3)
(21)
(32)
(4)
(24)
(18)
(30)
(23)
SEE NOTE 10
(26)
(27)
(29)
(19)
(31)
(22)
(2)
(51)
(36)
(9) SEE DETAIL "A"
(15)
(16)
(17)
(33)
(8) SEE NOTE 9
SEE NOTE 8
(35)
(25)
(14)
(5)
(K3)

1899950 REV SH

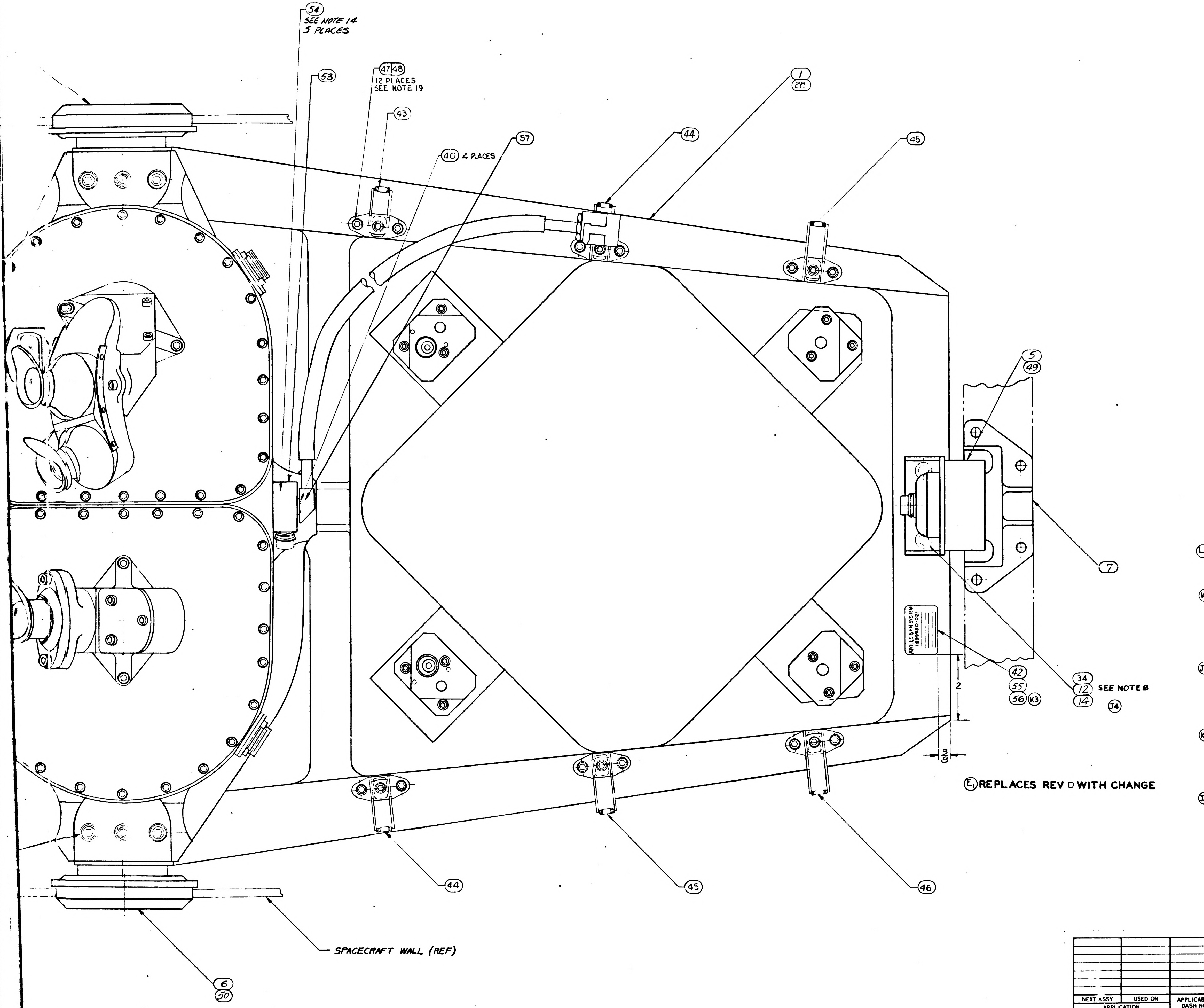
1711899950

1899950

1899950

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
E		REPLACES REV D WITH CHANGE			WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		29 AUG 63	RWG
G_2		REVISED PER TDRR NO. 03098			9/17/63
H_2		REVISED PER TDRR NO. 03668		2 OCT 63	WK
J_6		REVISED PER TDRR NO. 04990		17 DEC 63	
K_9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L_2		REVISED PER TDRR NO. 06742		MAR 64	WK
M		REVISED PER TDRR NO. 07072		APR 64	
N		REVISED PER TDRR 09654			MEM
P		REVISED PER TDRR 11914		4 SEP 64	DAS
R_1		REVISED PER TDRR 12536		25 SEP 64	EL
S		REVISED PER TDRR 13157		16 OCT 64	
T		REVISED PER TDRR 13468		27 OCT 64	
U		REVISED PER TDRR 14671		2 DEC 64	
V		REVISED PER TDRR 14672		17 DEC 64	WP
W		REVISED PER TDRR 16672		25 FEB 65	DAS
Y		REVISED PER TDRR 18533		26 APR 66	RJJ W.L.



(E) REPLACES REV D WITH CHANGE

	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
	1					56	1014650-18	PLATE, IDENTIFICATION
		1				55	1014650-17	PLATE, IDENTIFICATION
	5					54	1011625-39	SCREW-SOCKET HEAD CAP
	1					53	1021407	ADAPTER PLATE ASSY COOL. HOSE BYP
	1					52	2011000	OPTICAL UNIT
	1					51	1338952	BELLOWS ASSEMBLY SXT
	2	2				50	1010828	MOUNT, RESILIENT, FRONT
	1	1				49	1010827	MOUNT, RESILIENT, REAR
	12	12	12	12		48	MS16214-4	WASHER-LOCK
	12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
	1	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
	2	2	2	2		45	1010400-3	
	2	2	2	2		44	1010400-2	
	1	1	1	1		43	1010400-1	
	≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
	~~4~~	~~4~~	~~4~~			41	~~1006997~~	~~WASHER, PLAIN FLAT~~
	≠	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
	≠	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
	≠	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
(L2)	1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
	3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
	4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
	2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
	3	3	3			33	1899984	CENTERING COLLAR
(K2)	1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
	1	1	1			31	1899997-002	
	1	1	1			30	1899996-001	
	1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
	1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
	24	24	24	24		27	AN960C-10L	WASHER, FLAT
	24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
(J1)				4		25	MS20005-12	BOLT, INTERNAL WRENCHING
		1	1	1		24	1011000	OPTICAL UNIT
	1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
				1		22	1899954-002	SEAL, BELLOWS
				1		21	1899954-001	SEAL, BELLOWS
	6	6	6	6		20	1899971	SPRING-SEAL RETAINING
				1		19	1899953-002	SEAL, BELLOWS
(K1)				1		18	1899953-001	SEAL, BELLOWS
				3		17	1899976	COLLAR, CENTERING
	6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
	3	3	3	3		15	1899977	WASHER
	6	6	6	6		14	AN960C-516L	WASHER, FLAT
(J2)				2		12	NAS145-11	BOLT - INTERNAL WRENCHING
	3	3	3	3		10	1899980	BOLT-HEX HEAD
				3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
	3	3	3	3		8	1899967	BALL, PRECISION
	1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
	1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
			1	1		5	1899969	MOUNT, RESILIENT, REAR
			2	2		4	1899970	MOUNT, RESILIENT, FRONT
	1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
		1	1	1		2	1899952	BELLOWS ASSEMBLY SXT
				1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

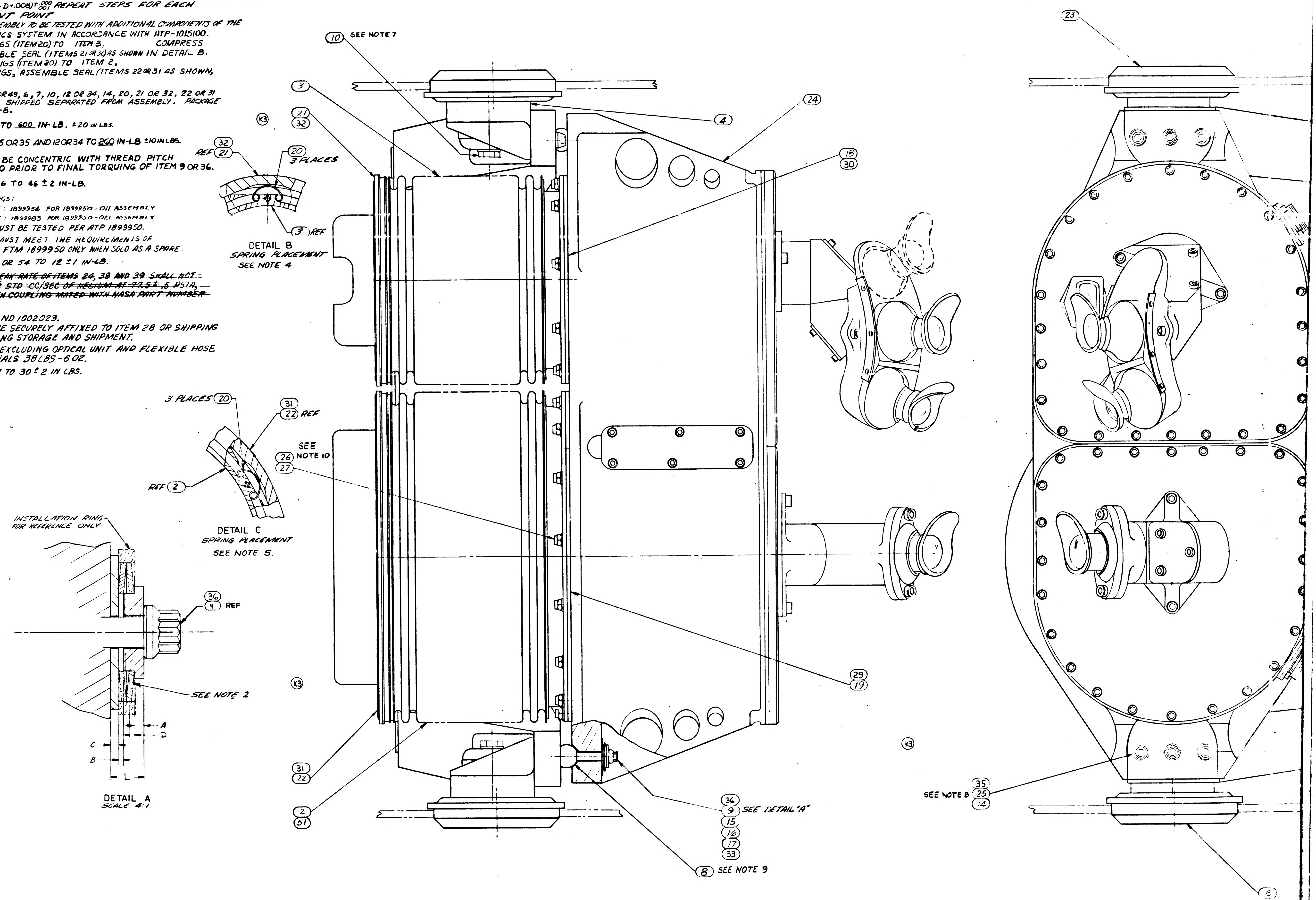
CODE IDENT NO. 80230 | SIZE J | 1899950
SCALE FULL | SHEET 1 OF 1

1899950 REV SH

271899950

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR (36) UNTIL $L = (A+B+C+D+.008)^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT (J6) (K4)
3. FOR REF ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3. COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B. (K5)
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C. (K6)
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21 OR 32, 22 OR 31 23 & 37 WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER MIL-P-116 IA-8. (K9) (J5) (L1)
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS. (J3)
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS. (K7)
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36. (K8)
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ± 1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10⁻⁶ STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 38 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.

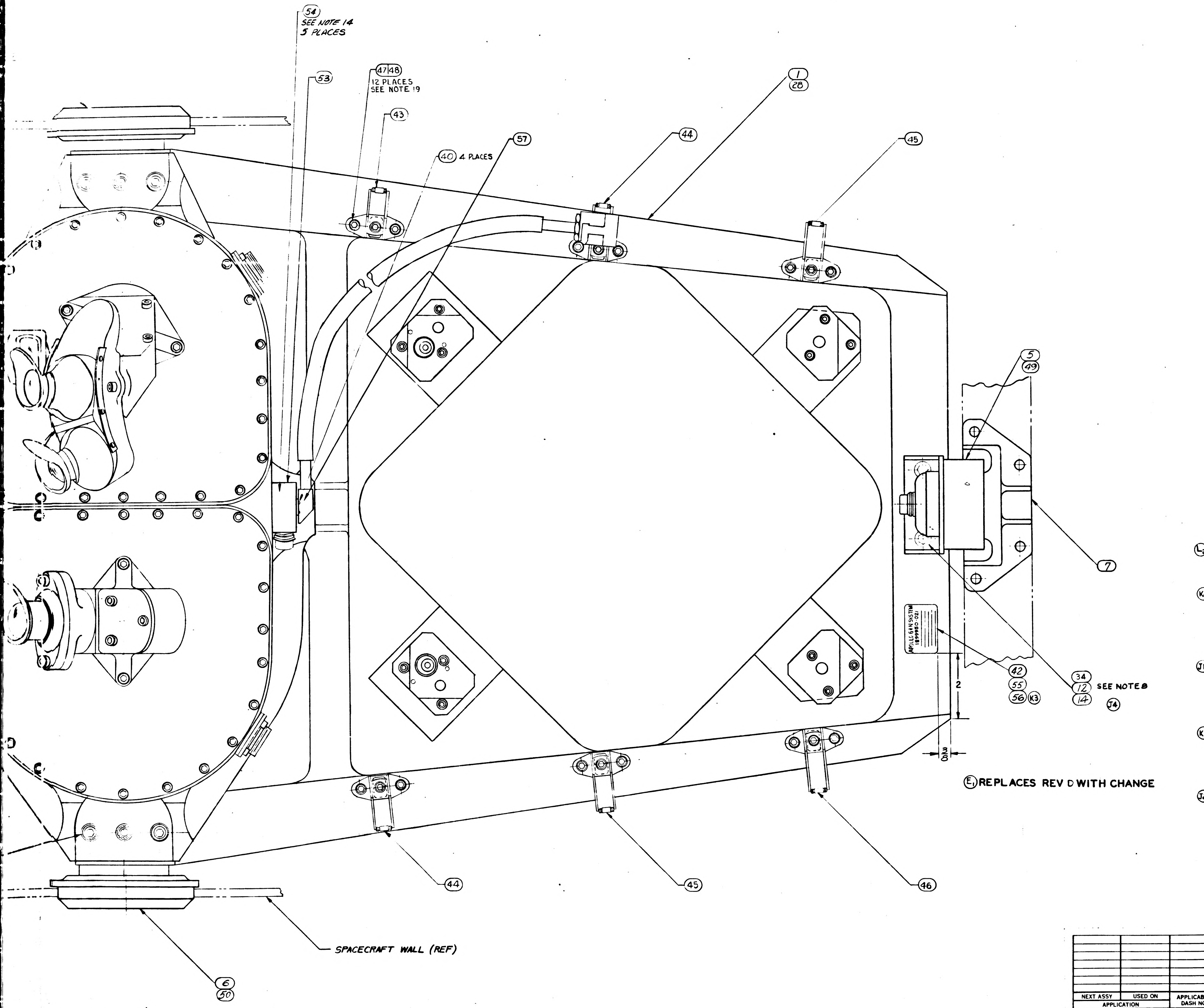


10 SEE NOTE 7
3
21
32
K3
32
REF 21
20
3 PLACES
3 REF
DETAIL B
SPRING PLACEMENT
SEE NOTE 4
4
24
18
30
23
3 PLACES 20
31
22 REF
SEE NOTE 10
26
27
REF 2
DETAIL C
SPRING PLACEMENT
SEE NOTE 5.
INSTALLATION RING FOR REFERENCE ONLY
36
9 REF
SEE NOTE 2
A
D
C
B
L
DETAIL A
SCALE 4:1
K3
29
19
31
22
2
51
36
9 SEE DETAIL "A"
15
16
17
33
8 SEE NOTE 9
K3
SEE NOTE 8
35
25
14

1899950

1/1899950

Z 1899950



(E) REPLACES REV D WITH CHANGE

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
E		REPLACES REV D WITH CHANGE			WK
F		REVISED IN ACCORDANCE WITH TDRR 02513		28 AUG 63	RWG
G_2		REVISED PER TDRR NO. 03098			9/7/63
H_2		REVISED PER TDRR NO. 03668		2 OCT 63	WK
J_6		REVISED PER TDRR NO. 04990		17 DEC 63	
K_9		REVISED PER TDRR NO. 06253		18 FEB 64	WK
L_2		REVISED PER TDRR NO. 06742		MAR 64	WK
M		REVISED PER TDRR NO. 07072		APR 64	
N		REVISED PER TDRR 09654		11 JUN 64	JNP MEM
P		REVISED PER TDRR 11914		4 SEP 64	JNP DAS
R_1		REVISED PER TDRR 12536		25 SEP 64	EL
S		REVISED PER TDRR 13157		16 OCT 64	JNP
T		REVISED PER TDRR 13468		OCT 64	
U		REVISED PER TDRR 14671		4 DEC 64	
V		REVISED PER TDRR 14672		7 DEC 64	JNP
W		REVISED PER TDRR 16672		25 FEB 65	DAS
Y		REVISED PER TDRR 18533		26 APR 65	RJJ
Z		REVISED PER TDRR 20249		25 JUN 65	PTP

041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1	1			57	1021414	ADAPTER PLATE ASSY, COOL HOSE BYP
1					56	1014650-18	PLATE, IDENTIFICATION
	1				55	1014650-17	PLATE, IDENTIFICATION
5					54	1011625-39	SCREW-SOCKET HEAD CAP
1					53	1021407	ADAPTER PLATE ASSY COOL. HOSE BYP
1					52	2011000	OPTICAL UNIT
1					51	1338952	BELLOWS ASSEMBLY SXT
2	2				50	1010828	MOUNT, RESILIENT, FRONT
1	1				49	1010827	MOUNT, RESILIENT, REAR
12	12	12	12		48	MS16214-4	WASHER-LOCK
12	12	12	12		47	NAS1351-3-6	SCREW-SOCKET HD CAP
1	1	1	1		46	1010400-4	CLAMP, LOOP HINGED
2	2	2	2		45	1010400-3	
2	2	2	2		44	1010400-2	
1	1	1	1		43	1010400-1	
≠	≠	1			42	1014650-9	PLATE, IDENTIFICATION
~~4~~	~~4~~	~~4~~			~~41~~	~~1006997~~	~~WASHER, PLAIN FLAT~~
≠	4	4			40	NAS1352C06 8	SCREW SOCKET HEAD CAP
≠	~~1~~	~~1~~			39	~~1011599-16~~	~~PACKING, PREFORMED~~
≠	~~1~~	~~1~~			38	~~1001471~~	~~HOSE FLEXIBLE ASSEMBLY~~
1	1	1	1		37	1899999-011	ISOLATOR LOCKOUT SET (NAV. BASE)
3	3	3			36	1010732-014	BOLT, EXTERNAL WRENCHING
4	4	4			35	1010727-001	BOLT, INTERNAL WRENCHING
2	2	2			34	1010728-001	BOLT, EXTERNAL WRENCHING
3	3	3			33	1899984	CENTERING COLLAR
1	1	1			32	1899997-001	SEAL, PLAIN ENCASED
1	1	1			31	1899997-002	
1	1	1			30	1899996-001	
1	1	1			29	1899996-002	SEAL, PLAIN ENCASED
1	1	1			28	1899982	FRAME ASS'Y, NAV. BASE
24	24	24	24		27	AN960C-10L	WASHER, FLAT
24	24	24	24		26	AN363C-1032	NUT, SELF LOCKING
			4		25	MS20005-12	BOLT, INTERNAL WRENCHING
	1	1	1		24	1011000	OPTICAL UNIT
1	1	1	1		23	1899978	SNUBBER, FRONT R.H. (INSEP) ASSY
			1		22	1899954-002	SEAL, BELLOWS
			1		21	1899954-001	SEAL, BELLOWS
6	6	6	6		20	1899971	SPRING-SEAL RETAINING
			1		19	1899953-002	SEAL, BELLOWS
			1		18	1899953-001	SEAL, BELLOWS
			3		17	1899976	COLLAR, CENTERING
6	6	6	6		16	1899979	WASHER-SPRING BELLEVILLE
3	3	3	3		15	1899977	WASHER
6	6	6	6		14	AN960C-516L	WASHER, FLAT
			2		12	NAS145-11	BOLT - INTERNAL WRENCHING
3	3	3	3		10	1899980	BOLT-HEX HEAD
			3		9	MS21250-04028	BOLT, 12 POINT EXT WRENCHING
3	3	3	3		8	1899967	BALL, PRECISION
1	1	1	1		7	1899975	SNUBBER, REAR (INSEP) ASSY
1	1	1	1		6	1899974	SNUBBER, FRONT L.H. (INSEP) ASSY
		1	1		5	1899969	MOUNT, RESILIENT, REAR
		2	2		4	1899970	MOUNT, RESILIENT, FRONT
1	1	1	1		3	1899951	BELLOWS ASSEMBLY, SCT
	1	1	1		2	1899952	BELLOWS ASSEMBLY, SXT
			1		1	1899966	FRAME ASSY-NAVIGATION BASE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS
DRAWN F. KORACIN 11 APR 63
CHECKED MALIKOWSKI 12 APR 63
APPROVAL J. HANN 12 APR 63
APPROVAL A. KODEL 12 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE AND
OPTICAL UNIT
ASSEMBLY

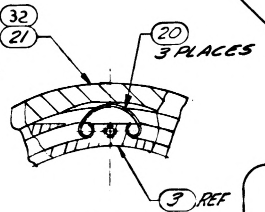
CODE IDENT NO. 80230
SIZE J
1899950
SCALE FULL SEE NOTE 18
SHEET 1 OF 1

1899950 REV Z SH 1

2/1899950

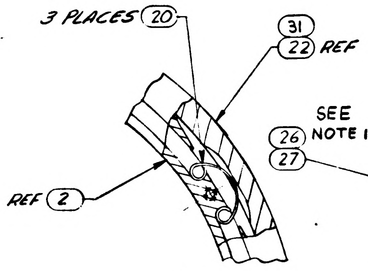
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DETERMINE DIMENSIONS A, B, C AND D. TIGHTEN ITEM ⑨ OR (36) UNTIL L=(A+B+C+D+.008) $^{+.000}_{-.001}$ REPEAT STEPS FOR EACH OPTICS MOUNT POINT
3. FOR [illegible] ONLY: ASSEMBLY TO BE TESTED WITH ADDITIONAL COMPONENTS OF THE OPERATIONAL OPTICS SYSTEM IN ACCORDANCE WITH ATP-1015100.
4. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 3. COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 21 OR 32) AS SHOWN IN DETAIL B.
5. ASSEMBLE SPRINGS (ITEM 20) TO ITEM 2, COMPRESS SPRINGS, ASSEMBLE SEAL (ITEMS 22 OR 31 AS SHOWN, IN DETAIL C.
6. ITEMS 4 OR 50, 5 OR 49, 6, 7, 10, 12 OR 34, 14, 20, 21 OR 32, 22 OR 31 23 & 3[illegible] WILL BE SHIPPED SEPARATED FROM ASSEMBLY. PACKAGE PER [illegible]-116 IA-8.
7. TORQUE ITEM 10 TO 600 IN-LB. ±20 IN LBS.
8. TORQUE ITEMS 25 OR 35 AND 12 OR 34 TO 260 IN-LB ±10 IN LBS.
9. I.D. OF BALL TO BE CONCENTRIC WITH THREAD PITCH DIA WITHIN .020 PRIOR TO FINAL TORQUING OF ITEM 9 OR 36.
10. TORQUE ITEM 26 TO 46 ± 2 IN-LB.
11. REFERENCE DRAWINGS:
    FAMILY TREE: 1899956 FOR 1899950-011 ASSEMBLY
    FAMILY TREE: 1899983 FOR 1899950-021 ASSEMBLY
12. THIS ASSEMBLY MUST BE TESTED PER ATP 1899950.
13. THIS ASSEMBLY MUST MEET THE REQUIREMENTS OF PS1899950 AND FTM 1899950 ONLY WHEN SOLD AS A SPARE.
14. TORQUE ITEM 40 OR 54 TO 12 ±1 IN-LB.
15. ~~THE ASSEMBLY LEAK RATE OF ITEMS 24, 38 AND 39 SHALL NOT EXCEED 10 x 10-6 STD CC/SEC OF HELIUM AT 77.5 ± .5 PSIA, WHEN TESTED WITH COUPLING MATED WITH NASA PART NUMBER 1000135.~~
16. SERIALIZE PER ND 1002023.
17. ITEM 53 OR 57 SHALL BE SECURELY AFFIXED TO ITEM 28 OR SHIPPING CONTAINER DURING STORAGE AND SHIPMENT.
18. APPROX. WEIGHT EXCLUDING OPTICAL UNIT AND FLEXIBLE HOSE ASSEMBLY EQUALS 38 LBS.-6 OZ.
19. TORQUE ITEM 47 TO 30 ± 2 IN LBS.



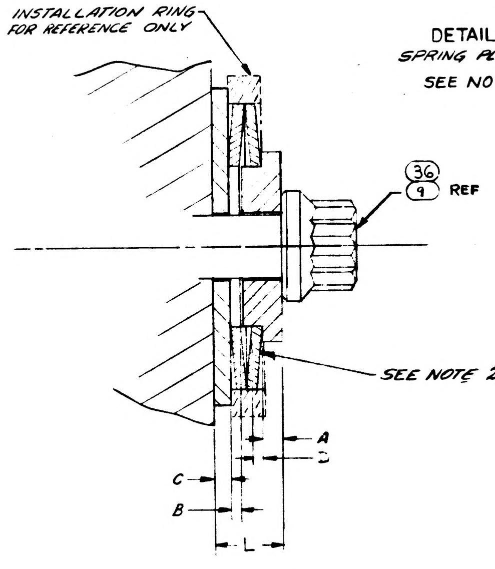
(32)
REF (21)
(20)
3 PLACES
(3) REF

DETAIL B
SPRING PLACEMENT
SEE NOTE 4



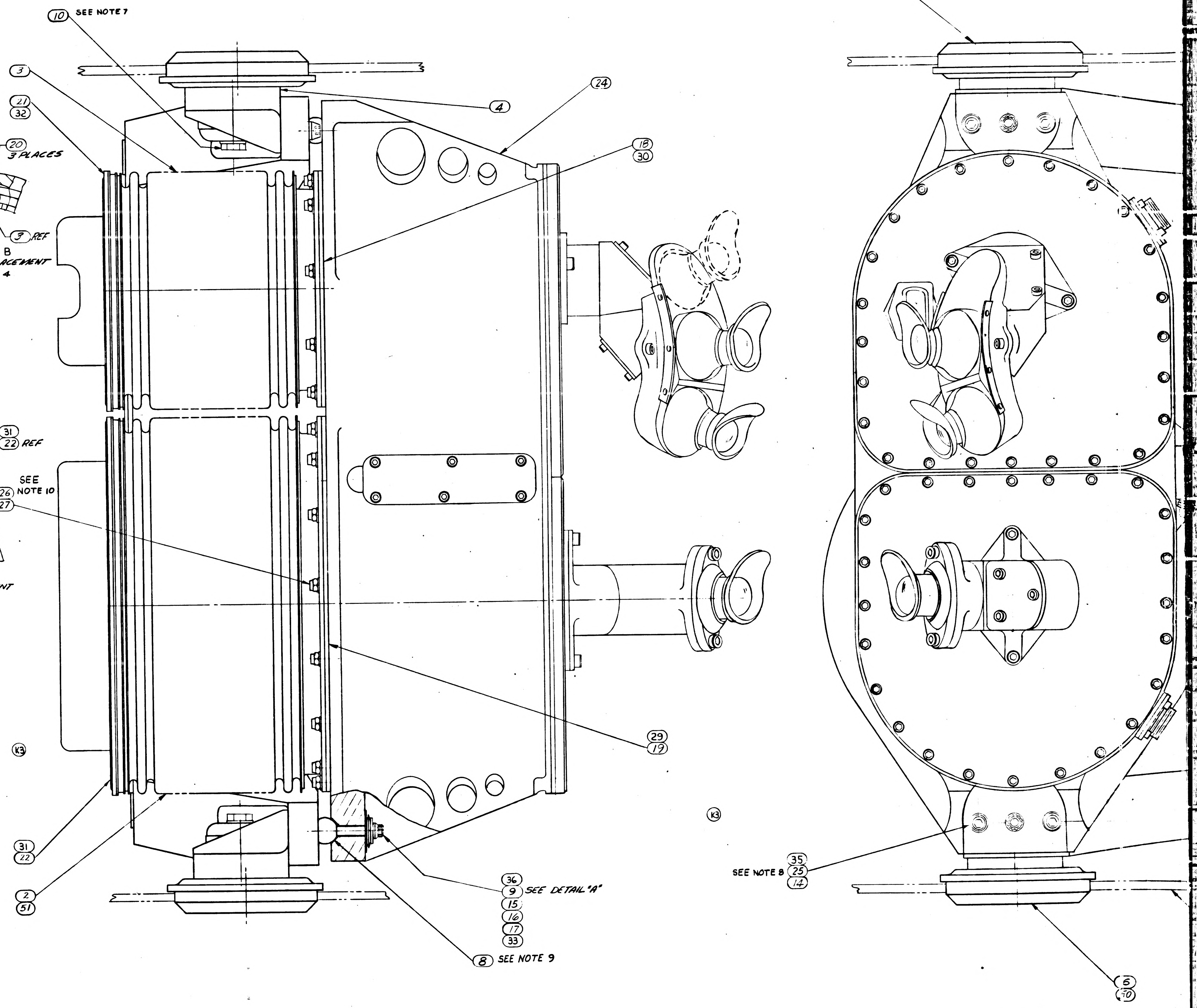
3 PLACES (20)
(31)
(22) REF
REF (2)

DETAIL C
SPRING PLACEMENT
SEE NOTE 5.



INSTALLATION RING FOR REFERENCE ONLY
(36)
(9) REF
SEE NOTE 2
A
D
C
B
L

DETAIL A
SCALE 4:1



(10) SEE NOTE 7
(3)
(21)
(32)
(4)
(24)
(18)
(30)
(23)
SEE NOTE 10
(26)
(27)
(29)
(19)
(31)
(22)
(2)
(51)
(36)
(9) SEE DETAIL "A"
(15)
(16)
(17)
(33)
(8) SEE NOTE 9
SEE NOTE 8
(35)
(25)
(14)
(6)
(70)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00916 DATE . 17Apr63

			3			AN-960C-716L	WASHER, FLAT
			6			AN-960C-516L	WASHER, FLAT
			24			AN-960C-10L	WASHER, FLAT
			3			MS-21250-07028	BOLT, 12 POINT EXT WRENCHING
			2			MS-21250-05066	BOLT, 12 POINT EXT WRENCHING
			3			MS-21250-04028	BOLT, 12 POINT EXT WRENCHING
			24			MS-20365-1032A	NUT, SELF LOCKING
			4			MS-20005-16	BOLT, INTERNAL WRENCHING
			3			1010404	WASHER, BELLEVILLE
			1			1011000	OPTICS SUBSYSTEM
			1			1899978	SNUBBER, FRONT RH
			3			1899977	WASHER, FLAT SPECIAL
			3			1899976	COLLAR, CENTERING
			1			1899975	SNUBBER, REAR
			1			1899974	SNUBBER, FRONT LH
			1			1899973	BELLOWS & SEAL ASSY, SXT
			1			1899972	BELLOWS & SEAL ASSY, SCT
			2			1899970	MOUNT, RESILIANT, FRONT
			1			1899969	MOUNT, RESILIANT, REAR
			3			1899967	BALL, PRECISION
			1			1899966	FRAME ASSY, NAV BASE
			1			1899953-002	SEAL, BELLOWS
			1			1899953-001	SEAL, BELLOWS
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +— —— DECIMALS +— —— ANGLES +— ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F Koracin DATE 11 APR 63
12 APR 63
CHECKED
APPROVAL J. Hans 12 APR 63
APPROVAL 18 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE &
OPTICS SUBSYSTEM ASSEMBLY

CODE IDENT NO.
SIZE D
1899950
SCALE —
SHEET

MIL 10780-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS 1899950
Original Issue Date: 7-1-64
Release Authority: TDRR 10701
Class A Release

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA

This specification consists of page i [illegible] inclusive.
and 1 to 3 inclusive.

APPROVALS	7/1/64 NASA/MSC	July 64	7/1/64 MIT/IL	R.E. Lietz ACSP

APOLLO G&N Specification
PS-1899950
1 July 1964

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Navigation Base and Optical Unit Assembly, Drawing 1899950, hereafter called the assembly.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of this specification form a part of this specification to the extent specified herein.

SPECIFICATIONS

APOLLO G&N

ND-1002210	General Specification for Procurement of APOLLO Guidance and Navigation Assemblies and Subassemblies
ND-1002214	General Specification for Preservation, Packaging, Packing and Container Marking of Apollo Guidance and Navigation Major Assemblies, Assemblies, Subassemblies and Parts.
PTM-1899950	Final Test Method for Navigation Base and Optical Unit Assembly

DRAWINGS

APOLLO G&N

1899950	Navigation Base and Optical Unit Assembly

2.1.2 [illegible]

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS 1899950
Original Issue Date: 7 - 1 - 64
Release Authority: TDRR 10791
Class A Release

PROCUREMENT SPECIFICATION
FOR
NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA

This specification consists of page i
and 1 to 3 inclusive.

APPROVALS	NASA/MSC	July 64	7/1/64 MIT/IL	R E Leitz	ACSP

APOLLO G&N Specification
PS-1899950
1 July 1964

PROCUREMENT SPECIFICATION

FOR

NAVIGATION BASE AND OPTICAL UNIT ASSEMBLY

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Navigation Base and Optical Unit Assembly, Drawing 1899950, hereafter called the assembly.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of this specification form a part of this specification to the extent specified herein.

SPECIFICATIONS

APOLLO G&N

ND-1002210	General Specification for Procurement of APOLLO Guidance and Navigation Assemblies and Subassemblies
ND-1002214	General Specification for Preservation, Packaging, Packing and Container Marking of Apollo Guidance and Navigation Major Assemblies, Assemblies, Subassemblies and Parts.
FTM-1899950	Final Test Method for Navigation Base and Optical Unit Assembly

DRAWINGS

APOLLO G&N

1899950	Navigation Base and Optical Unit Assembly

3. REQUIREMENTS

3.1 GENERAL SPECIFICATION. All of the requirements of Specification ND-1002210 with the exception of the workmanship vibration requirement shall apply as requirements of this specification.

3.2 DESCRIPTION. The assembly consists of a Navigation Base Frame Assembly, Optical Unit Assembly, Bellows, Seals, Resilient Mounts, and mounting hardware.

3.3 FUNCTIONAL REQUIREMENTS

3.3.1 Electrical Inputs. The following electrical inputs are required to test the assembly.

a. 28 + 2, -3 vdc, 95 watts
b. 115 ±11.5 vac, 400 cps, 30 watts

3.3.2 Optics Assembly to IMU Mounting Pad Alignment. With the Optics Subsystem in the ZERO OPTICS mode and subsequently set to the NORMAL mode, the 2 speed trunnion and shaft CDU 16 speed resolver outputs shall be less than 10 mv rms and the optical centerline of the SXT shall be aligned to the planes formed by the IMU mounting pads and alignment pins as follows:

a. The SXT STAR line-of-sight shall be parallel to the Z_{NB} component of the IMU mounting pads to within 26 arc seconds at any given shaft angle.

b. The SXT STAR line-of-sight, at $A_S = 0^\circ$, shall be parallel to the $X_{NB}Z_{NB}$ plane as established by the IMU mounting pads and alignment pins to within 21 arc seconds at any useful trunnion angle.

3.4 PERFORMANCE AND PRODUCT CHARACTERISTICS.

3.4.1 Service Life.

3.4.1.1 Operating Life. The assembly shall meet performance specifications for at least 2000 hours of operation, excluding the supplier's test time of the completed unit.

3.4.1.2 Shelf Life. The assembly shall have a shelf life of at least 3 years, without operation, at ambient room temperature after final acceptance at the supplier's facility when packaged in accordance with Specification ND-1002214.

3.4.2 Reliability. Design objectives require maximum reliability of the assembly during its period of useful life. Every effort shall be made to design and produce units capable of meeting a maximum failure rate of 85 failures per million hours.

4. QUALITY ASSURANCE PROVISIONS

4.1 GENERAL SPECIFICATION. Unless otherwise specified herein, all the quality assurance provisions of Specification ND-1002210 shall form a part of this specification.

4.2 NASA ACCEPTANCE INSPECTION. The NASA acceptance inspection shall be in accordance with Specification FTM-1899950.

5. PREPARATION FOR DELIVERY

5.1 GENERAL. Preparation for delivery shall be in accordance with Specification ND-1002210.

6. NOTES. None.

Notice: When APOLLO G&N drawings, specifications, or other data are used for any purpose other than in connection with a definitely related NASA procurement operation, NASA thereby incurs no responsibility nor any obligation whatsoever; and the fact that NASA may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

EA:pbv

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

▷1 FORGING PER QQ-S-763 CL 321 STAINLESS STEEL.

▷2 MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:
   - (A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
   - (B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.
   - ▷3 (C) INERT HELI-ARC WELD ITEMS (3|4|5|6) TO ITEM (1) AND WELD ITEMS (3|4|5|6) TO ITEM (2) PER MIL-W-8611 AS SHOWN OR PER ALTERNATE ASSEMBLY METHOD.
   - (D) WELDING TO BE INSPECTED PER MIL-I-6866.
   - (E) UNLESS OTHERWISE SPECIFIED:
     1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
     2. SURFACE ROUGHNESS NOT TO EXCEED 125/
   - (F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF 5/16 INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
   - (G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE SHALL NOT EXCEED 200#/IN. IN COMPRESSION AND 160#/IN. IN TENSION. THE RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 310#/IN.
   - (H) MAXIMUM RADIAL RESTRAINT OF 6 LBS PERMITTED.
   - (J) VENDOR SHIPPING REQUIREMENTS
     BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
   - (K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE).*
   - (L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)
   - (J5) ▷4 (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*
4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
   - (A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ± 1/4 INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

     SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

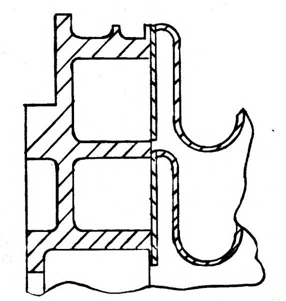
RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

   - (B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
   - (C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
   - (D) TEMPERATURE - +300°F TO -200°F.
   - (E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:
   - (A) *PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.*
   - (B) *EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ± .5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.*
   - (C) *WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.*

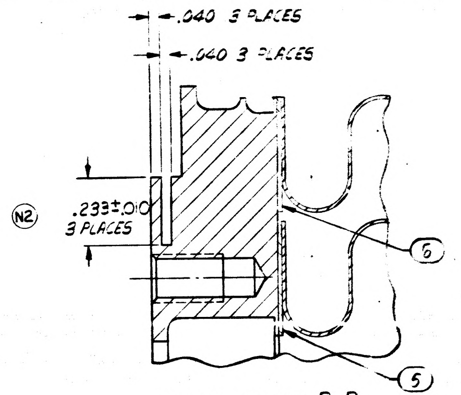
(N1) ▷5 THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ± 1/32 FROM NOMINAL DIMENSION.

NOTES (CONTINUED):

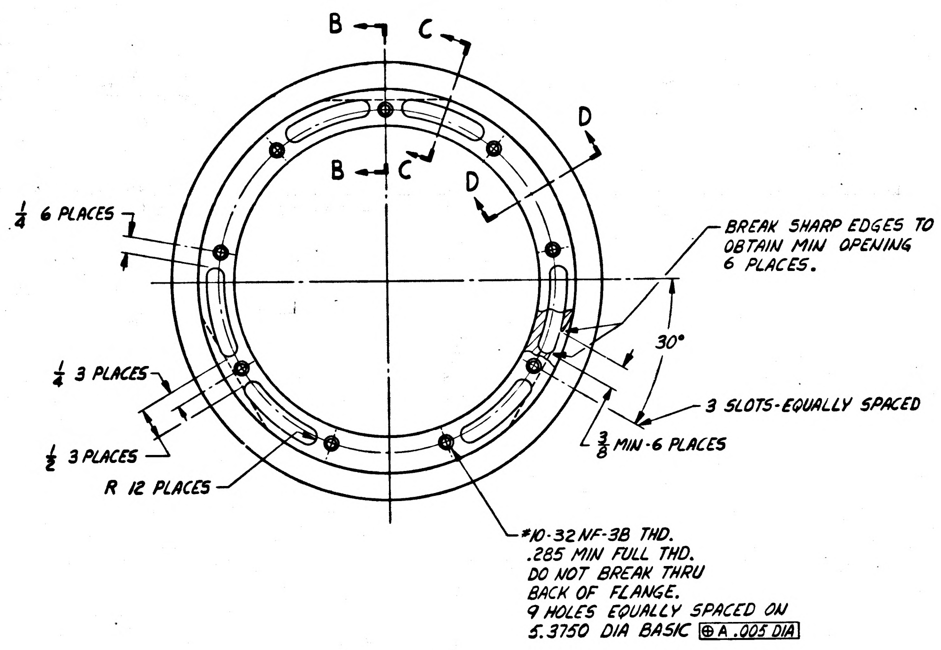
6. A. DENTS IN CORRUGATIONS SHALL NOT EXCEED .09 IN THE LONGITUDINAL DIRECTION AND .18 IN THE CIRCUMFERENTIAL DIRECTION. THE DEPTH OF THE DENT SHALL NOT EXCEED 10% OF EITHER THE LONGITUDINAL OR CIRCUMFERENTIAL DIMENSION, WHICHEVER IS SMALLER.
   - B. THERE SHALL BE NO GOUGES OR SCRATCHES IN THE DENTED AREA.
   - C. SCRATCH OR GOUGE DEPTH SHALL NOT EXCEED .0008 IN THE CREST OR VALLEY AND .0010 IN THE SIDEWALL OF THE CONVOLUTION.
   - D. DENTS SHALL NOT HAVE LESS THAN .010 RADIUS.

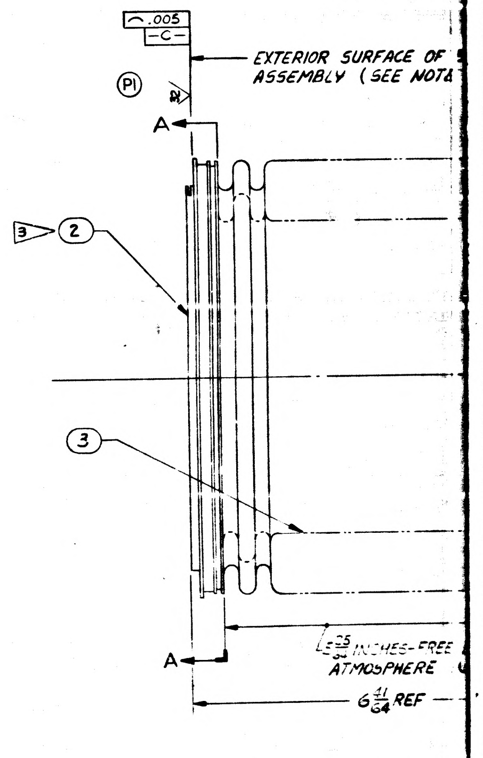


▷3 *ALTERNATE ASSEMBLY METHOD*



PARTIAL SECTION B-B
SCALE 4:1



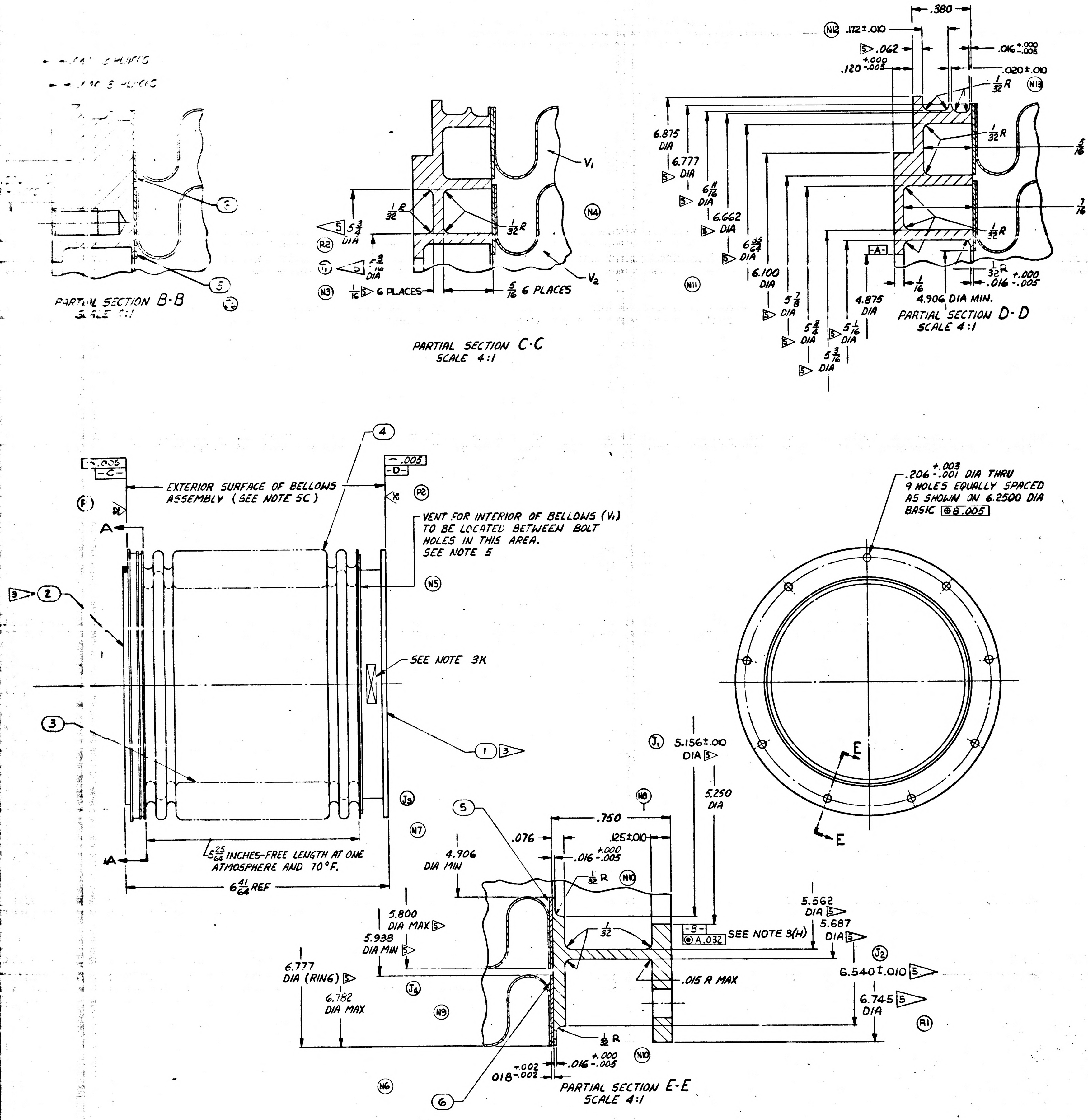


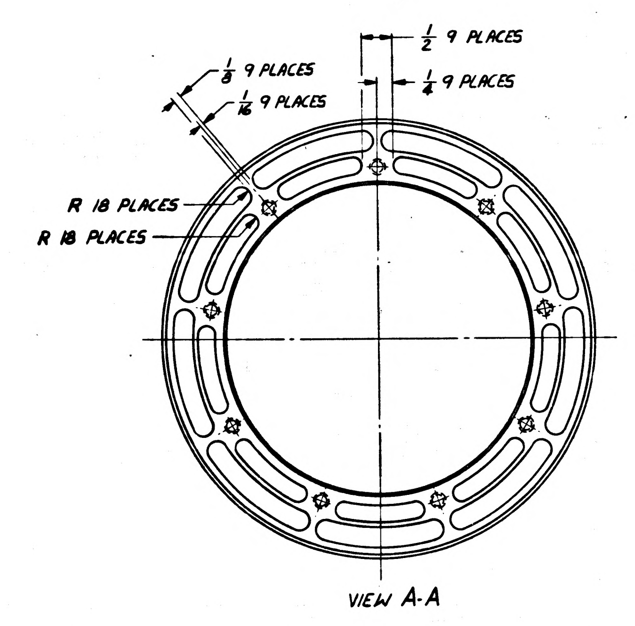
1899951

1/1899951

REVISIONS

SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE		APR 63	A.J.F.
J6		REVISED IN ACCORDANCE WITH TDRR 01498			
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 JUL 63	KWG
L		REVISED IN ACCORDANCE WITH TDRR 02514		20 AUG 63	R.V.G.
M		REVISED PER TDRR NO. 03671		21 OCT 63	
N13		REVISED PER TDRR NO. 04948		DEC. 63	
P2		REVISED PER TDRR NO. 05374		6 JAN 64	
R2		REVISED PER TDRR NO. 05725		2 JAN 64	
S		REVISED PER TDRR 07594		APR 64	
T		REVISED PER TDRR 08779		5 JUNE 64	RE
U		REVISED PER TDRR 10517		6 JUN 64	
V		REVISED PER TDRR 11627		26 AUG 64	
W		REVISED PER TDRR 29501		15 JUN 66	J.M.
Y		REVISED PER TDRR 36722		4 SEP 68	
Z		REVISED PER TDRR 37139		20 DEC 68	B.
AA		REVISED PER TDRR 37327		10 FEB 69	PHG


PARTIAL SECTION B-B
SCALE 1:1
PARTIAL SECTION C-C
SCALE 4:1
5 5/32 DIA
1/32
1 3/32 DIA
1/16 6 PLACES
5/16 6 PLACES
1/32 R
V1
V2
N4
PARTIAL SECTION D-D
SCALE 4:1
.380
.172±.010
.062
.120 +.000 -.005
.016 +.000 -.005
.020±.010
1/32 R
5/16 9 PLACES
7/16 3 PLACES
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 3/16 DIA
4.875 DIA
4.906 DIA MIN.
1/16
-A-
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
.005
-C-
-D-
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
SEE NOTE 3K
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
1
2
3
4
5
6
A
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕.005
E
PARTIAL SECTION E-E
SCALE 4:1
.750
.076
.125±.010
.016 +.000 -.005
1/32
1/32 R
4.906 DIA MIN
5.800 DIA MAX
5.938 DIA MIN
6.777 DIA (RING)
6.782 DIA MAX
5.156±.010 DIA
5.250 DIA
-B-
◎ A .032
SEE NOTE 3(H)
5.562 DIA
5.687 DIA
6.540±.010
6.745 DIA
.015 R MAX
.018 +.002 -.002
.016 +.000 -.005


1/8 9 PLACES
1/16 9 PLACES
1/2 9 PLACES
1/4 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A

LIST OF PARTS AND MATERIALS

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

1899951 AA

~~FOR INFORMATION ONLY~~

[redacted] TDR No. 00103 DATE

NEXT ASSY	USED ON
1899950-011	1899950-011
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 4/2/62
MIT APPROVAL 2 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

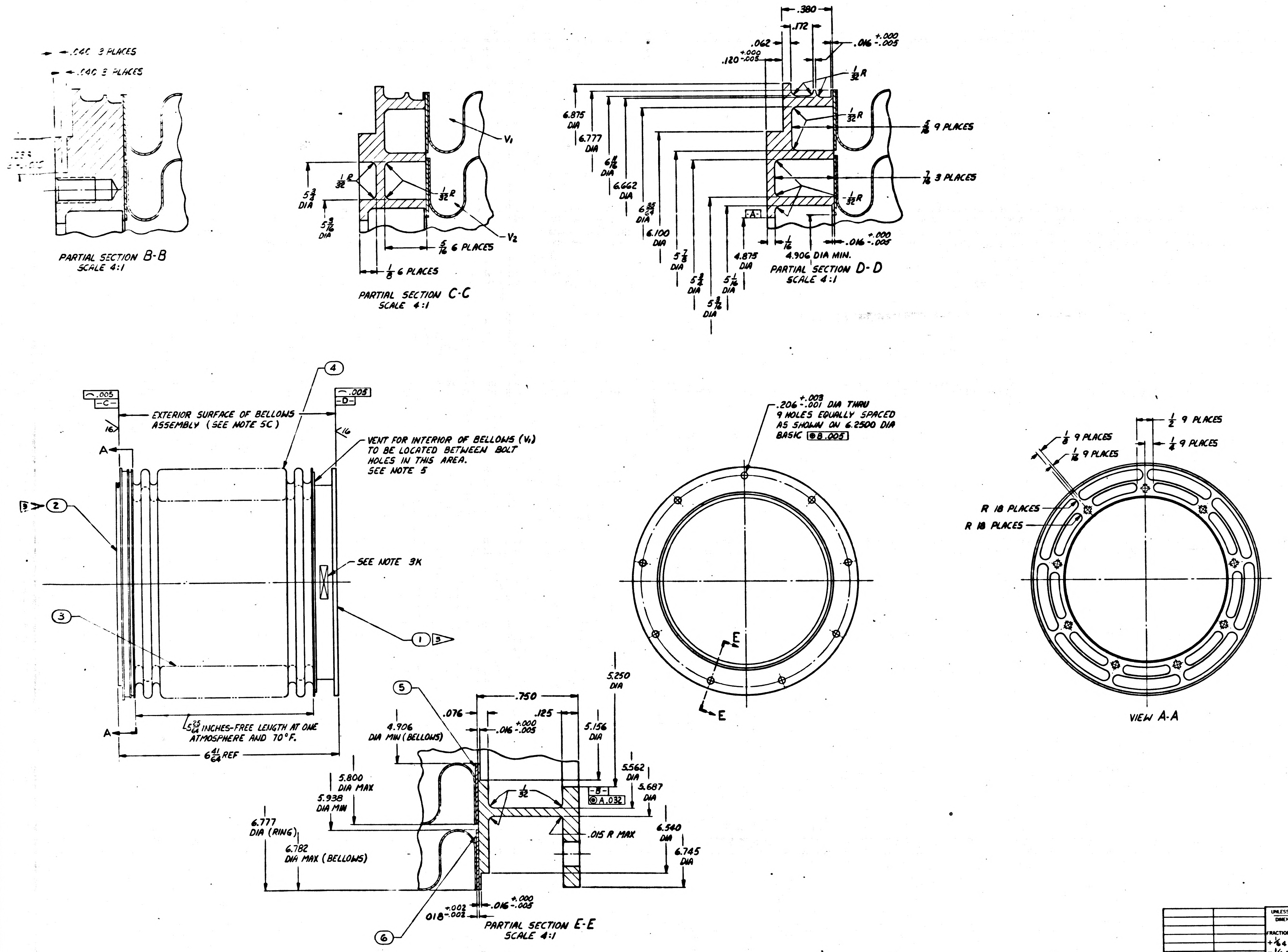
BELLOWS ASSEMBLY,
SCT

CODE IDENT NO. 99974
SIZE J
1899951
SCALE 1:1
APPROX 3LB.1303
SHEET

1899951 AA

27 1899951

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NC.	DATE	APPD
(M) H		UPGRADED FOR CLASS A RELEASE			A.J.F.



.040 3 PLACES
.040 3 PLACES
.380
.172
.062
.120 +.000 -.005
.016 +.000 -.005
1/32 R
5/16 9 PLACES
7/16 3 PLACES
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 3/8 DIA
4.875 DIA
4.906 DIA MIN.
-A-
1/16
V1
V2
5 3/4 DIA
5 9/16 DIA
5/16 6 PLACES
1/8 6 PLACES
⌒ .005 -C-
⌒ .005 -D-
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
SEE NOTE 3K
A
16
2
3
4
1
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
1/2 9 PLACES
1/4 9 PLACES
1/8 9 PLACES
1/16 9 PLACES
R 18 PLACES
R 18 PLACES
5
6
.750
.076
.125
.016 +.000 -.005
4.906 DIA MIN (BELLOWS)
5.250 DIA
5.156 DIA
5.562 DIA
5.687 DIA
-B-
⊚ A .032
1/32
5.800 DIA MAX
5.938 DIA MIN
6.777 DIA (RING)
6.782 DIA MAX (BELLOWS)
.015 R MAX
6.540 DIA
6.745 DIA
.018 +.002 -.002
.016 +.000 -.005

PARTIAL SECTION B-B
SCALE 4:1

PARTIAL SECTION C-C
SCALE 4:1

PARTIAL SECTION D-D
SCALE 4:1

PARTIAL SECTION E-E
SCALE 4:1

VIEW A-A

ITEM NO	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER ▷2
5	2	1899951-5	RING, ADAPTER, INNER ▷2
4	1	1899951-4	BELLOWS, OUTER ▷2
3	1	1899951-3	BELLOWS, INNER ▷2
2	1	1899951-2	S/C END RINGS ▷1
1	1	1899951-1	OPTICS END RING ▷1

LIST OF PARTS AND MATERIALS

1899951

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00103 DATE

1899950-011 NEXT ASSY	1899950-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES + - - - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION. GMC MILWAUKEE, WISCONSIN ACSP P/N
APPLICATION		MATERIAL SEE NOTE 2	DRAWN L. COOPER DATE 12 NOV 62 CHECKED 14 NOV 62 APPROVAL APPROVAL 14 NOV 62
		CONTRACT NAS 9-497	NASA APPROVAL 11/21/62 MIT APPROVAL 21 NOV 62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS, SCT
(INSEPARABLE,
ASSEMBLY

CODE IDENT NO	SIZE	
	J	1899951
SCALE 1:1		SHEET

1899951 -

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1 QQ-S-763 CL321 STAINLESS STEEL.

2 MIL-S-6721 CL-321 STAINLESS STEEL.

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   - (A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
   - (B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED
   - 3 (C) INERT HELI-ARC WELD ITEMS (3 4 5 6) TO ITEM (1) AND WELD ITEMS (3 4 5 6) TO ITEM (2) PER MIL-W-8611.
   - (D) WELDS TO BE INSPECTED PER MIL-I-6866.

   - (E) UNLESS OTHERWISE SPECIFIED:
     1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
     2. SURFACE ROUGHNESS NOT TO EXCEED 125√.
   - (F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
   - (G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156 #/IN.

   - (J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
   - (K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER AND SERIAL NUMBER AT THE INDICATED LOCATION PER MIL-STD-130 (NAMEPLATE PERMISSIBLE).
   - (L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)

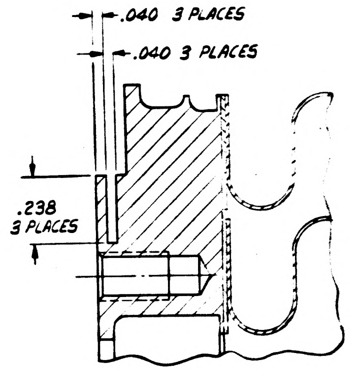
4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
   - (A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

     SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

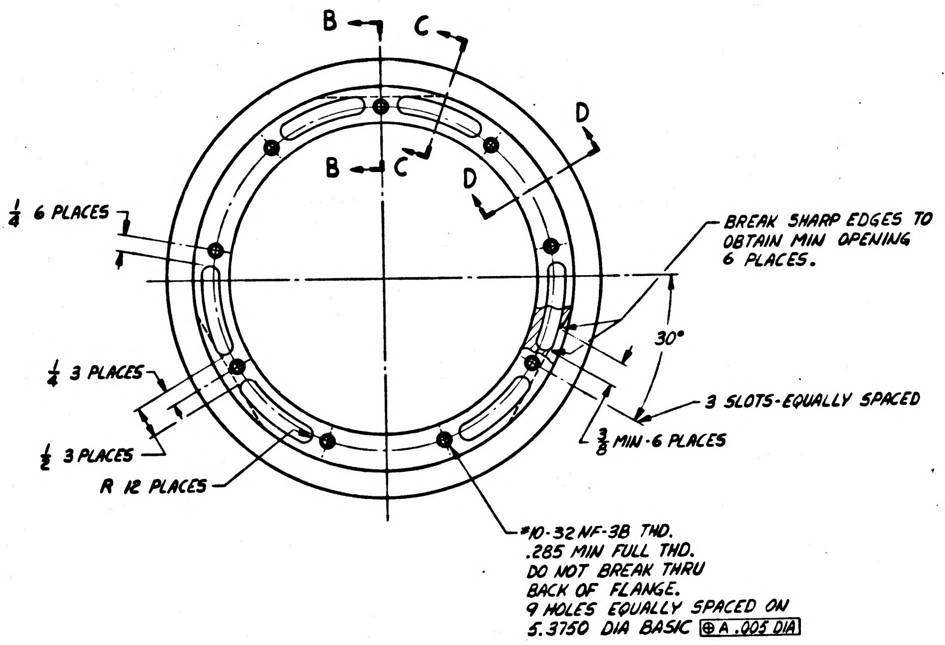
     RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

   - (B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
   - (C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
   - (D) TEMPERATURE - +300°F TO -200°F.
   - (E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:
   - (A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.
   - (B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
   - (C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

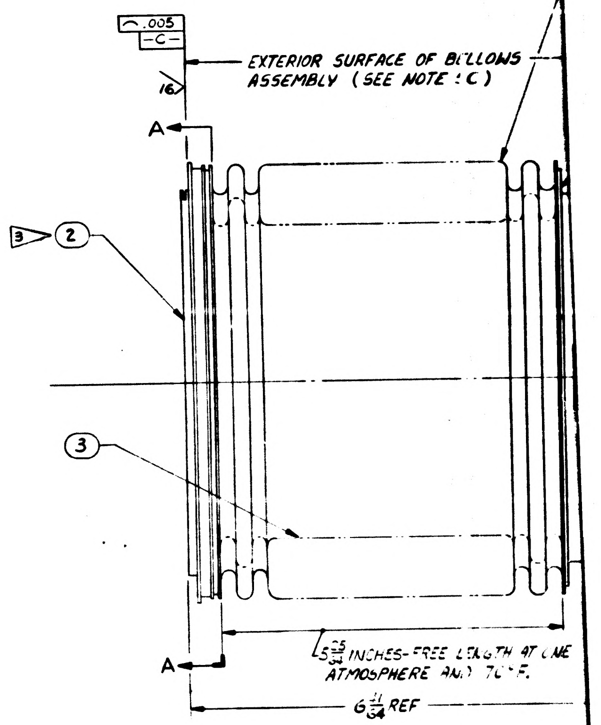


.040 3 PLACES
.040 3 PLACES
.238
3 PLACES

PARTIAL SECTION B-B
SCALE 4:1



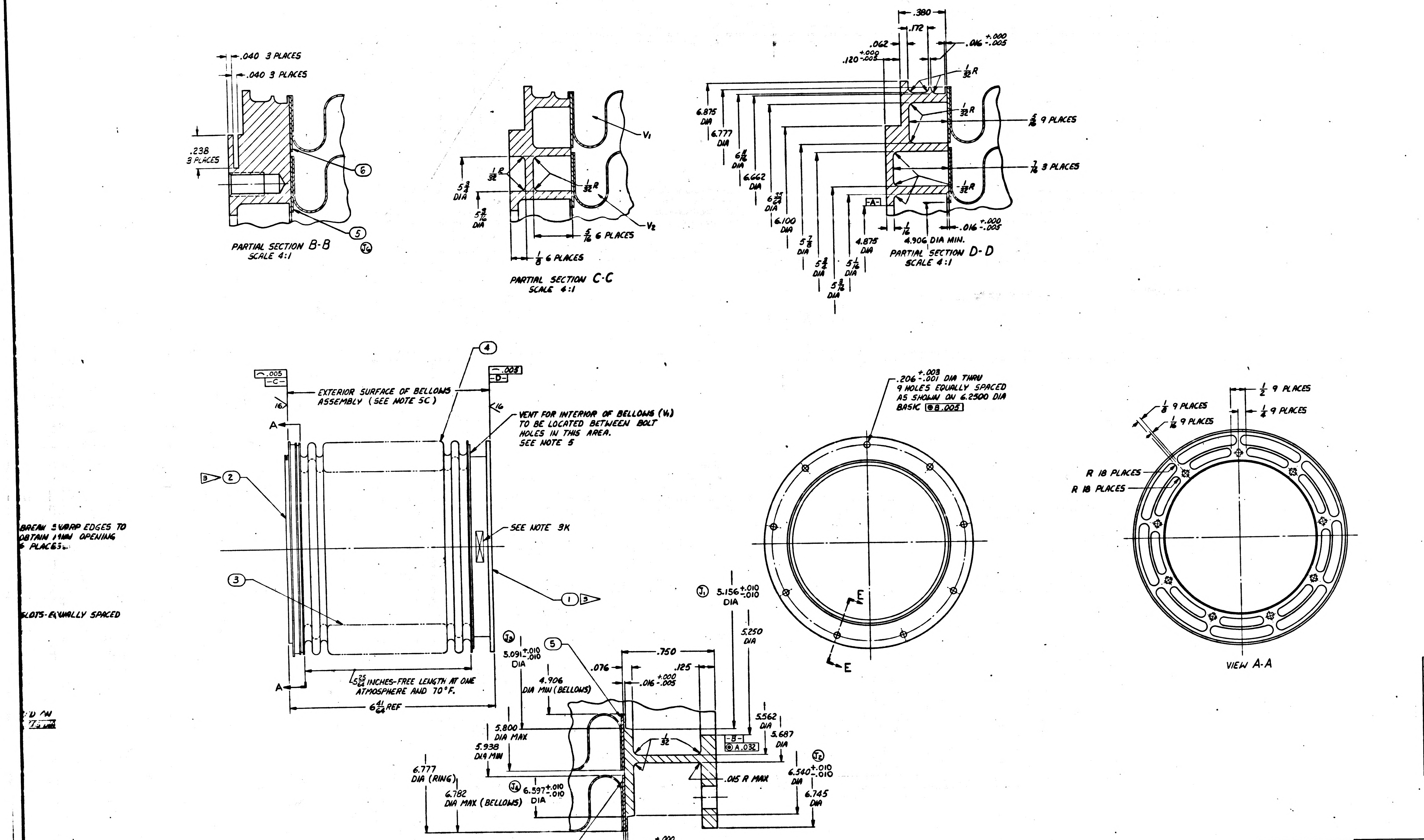
B
C
B
C
D
D
$\frac{1}{4}$ 6 PLACES
BREAK SHARP EDGES TO OBTAIN MIN OPENING 6 PLACES.
30°
3 SLOTS-EQUALLY SPACED
$\frac{3}{8}$ MIN-6 PLACES
$\frac{1}{4}$ 3 PLACES
$\frac{1}{2}$ 3 PLACES
R 12 PLACES
#10-32 NF-3B THD.
.285 MIN FULL THD.
DO NOT BREAK THRU
BACK OF FLANGE.
9 HOLES EQUALLY SPACED ON
5.3750 DIA BASIC ⊕ A .005 DIA



.005
-C-
16
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE : C)
A
3 (2)
(3)
A
$5\frac{25}{64}$ INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
$6\frac{11}{64}$ REF

1899951 -

SYM	ZONE	DESCRIPTION	CHG. NO.	DATE
4		UPGRADED FOR CLASS A RELEASE [illegible]		
J6		REVISED IN ACCORDANCE WITH [illegible]		



.040 3 PLACES
.040 3 PLACES
.238 3 PLACES
6
5
J6
PARTIAL SECTION B-B
SCALE 4:1
V1
V2
1/32 R
1/32 R
5 3/4 DIA
5 9/16 DIA
5/16 6 PLACES
1/8 6 PLACES
PARTIAL SECTION C-C
SCALE 4:1
.380
.172
.062
.120 +.000 -.005
.016 +.000 -.005
1/32 R
1/32 R
1/32 R
5/16 9 PLACES
7/16 3 PLACES
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 9/16 DIA
4.875 DIA
-A-
1/16
.016 +.000 -.005
4.906 DIA MIN.
PARTIAL SECTION D-D
SCALE 4:1
.005 -C-
.005 -D-
16
16
4
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
A
A
3 2
SEE NOTE 3K
3
1 3
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ◎ B .005
E
E
1/2 9 PLACES
1/4 9 PLACES
1/8 9 PLACES
1/16 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A
J1 5.156 +.010 -.010 DIA
5.250 DIA
J3 5.091 +.010 -.010 DIA
5
.750
.076
.125
.016 +.000 -.005
4.906 DIA MIN (BELLOWS)
5.562 DIA
-B-
◎ A .032
5.687 DIA
1/32
5.800 DIA MAX
5.938 DIA MIN
.015 R MAX
J2 6.540 +.010 -.010 DIA
6.745 DIA
6.777 DIA (RING)
6.782 DIA MAX (BELLOWS)
J4 6.597 +.010 -.010 DIA

.018 +.002 -.002

.016 +.000 -.005

6

PARTIAL SECTION E-E
SCALE 4:1

BREAK SHARP EDGES TO
OBTAIN MIN OPENING
6 PLACES.

SLOTS-EQUALLY SPACED

.D ON

ITEM NO	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 3
5	2	1899951-5	RING, ADAPTER, INNER
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1		1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

FOR INFORMATION O

~~CLASS B RELEASE~~ TDR No. 00103

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 6
APPROVAL 14 Nov 62
NASA APPROVAL 4/2/62
MIT APPROVAL 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY

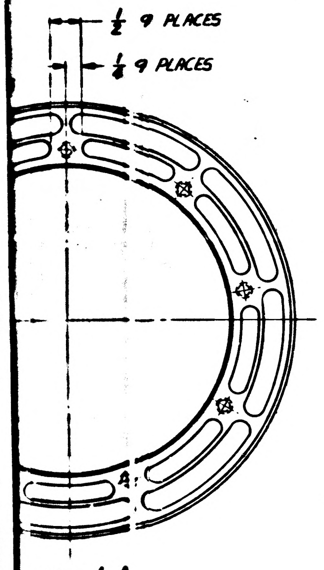
CODE IDENT NO.
SIZE J
1899951
SCALE 1:1

1899951 H

INCHES
PHOTOGRAPHIC SCALE ONLY

F-2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APP'D
Ⓜ H		UPGRADED FOR CLASS A RELEASE TDRR 01446		27-APR-63	A.J.F. / WR
		REVISED IN ACCORDANCE WITH TDRR 01498			WK



VIEW A-A

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2▷ 4▷
5	2	1899951-5	RING, ADAPTER, INNER 2▷
4	1	1899951-4	BELLOWS, OUTER 2▷
3	1	1899951-3	BELLOWS, INNER 2▷
2	1	1899951-2	S/C END RINGS 1▷
1	1	1899951-1	OPTICS END RING 1▷

LIST OF PARTS AND MATERIALS

J 1899951 B

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00103 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 4/21/63
MIT APPROVAL W. Kupfer 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

2H

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:
   - 1▷ QQ-S-763 CL321 STAINLESS STEEL.
   - 2▷ MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:
   - (A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
   - (B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.
   - 3▷ (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611.
   - (D) WELDS TO BE INSPECTED PER MIL-I-6866.
   - (E) UNLESS OTHERWISE SPECIFIED:
     1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
     2. SURFACE ROUGHNESS NOT TO EXCEED 125√.
   - (F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
   - (G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156 #/IN.
   - (J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
   - (K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER AND SERIAL NUMBER AT THE INDICATED LOCATION PER MIL-STD-130 (NAMEPLATE PERMISSIBLE).
   - (L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)
   - J5 4▷ (M) THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.

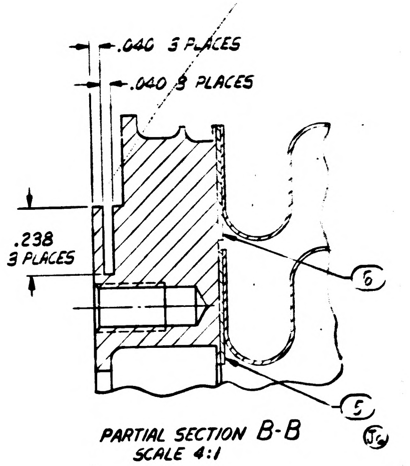
4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
   - (A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE $\pm\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

     SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

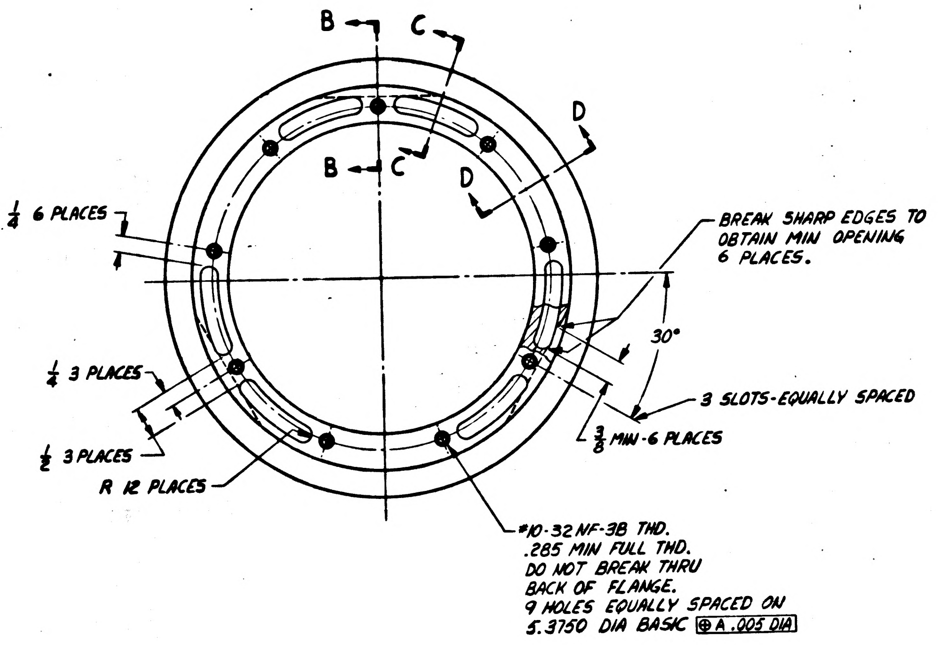
FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

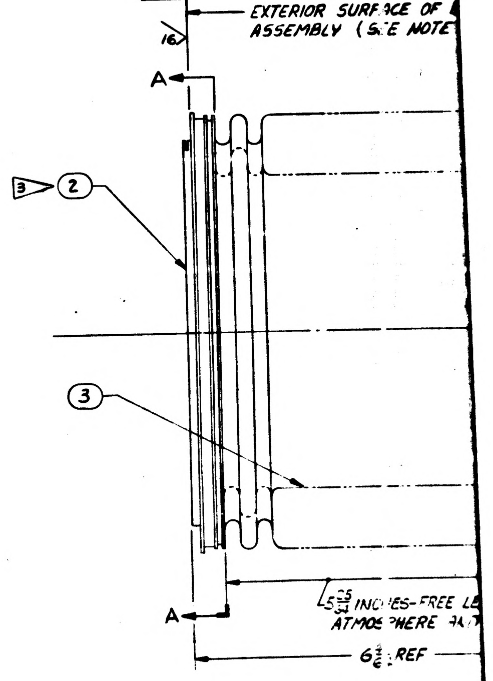
     RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.
   - (B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
   - (C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
   - (D) TEMPERATURE - +300°F TO -200°F.
   - (E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:
   - (A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.
   - (B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ± .5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
   - (C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

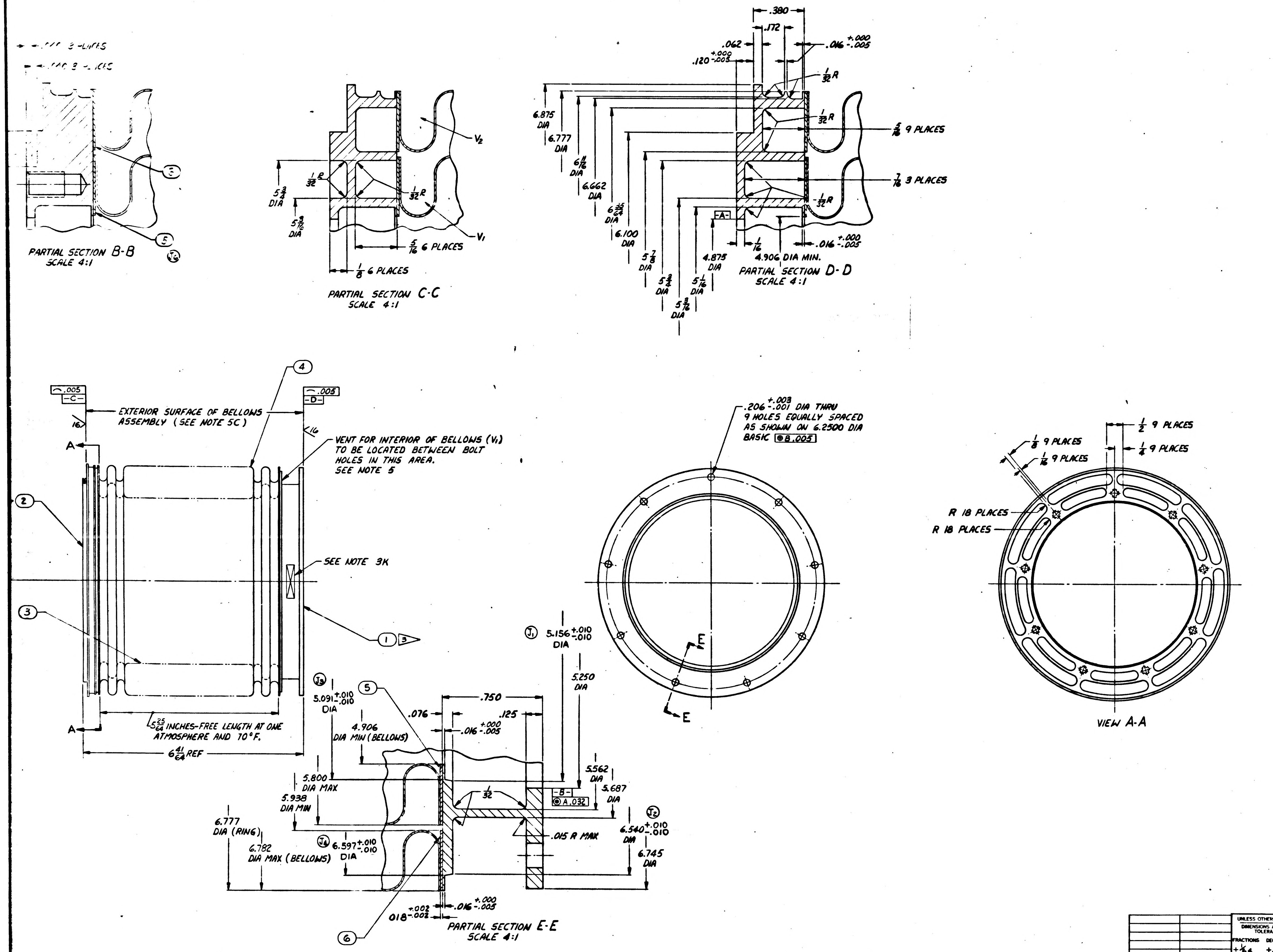


PARTIAL SECTION B-B
SCALE 4:1





REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
(M) H		UPGRADES FOR CLASS A RELEASE		27 APR	A.J.F.
J6		REVISED IN ACCORDANCE WITH TDRR 0298			
K		REVISED IN ACCORDANCE WITH TDRR 02308		3 July 63	R.H.G.



.380
.172
.062
.120 +.000 -.005
.016 +.000 -.005
1/32 R
5/16 9 PLACES
7/16 3 PLACES
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 9/16 DIA
4.875 DIA
4.906 DIA MIN.
-A-
1/16
V2
V1
5 3/4 DIA
5 9/16 DIA
5/16 6 PLACES
1/8 6 PLACES
.005 -C-
.005 -D-
16
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
SEE NOTE 3K
A
A
1
2
3
4
5
6
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
E
1/8 9 PLACES
1/16 9 PLACES
1/2 9 PLACES
1/4 9 PLACES
R 18 PLACES
R 18 PLACES
5.091 +.010 -.010 DIA
4.906 DIA MIN (BELLOWS)
.076
.750
.125
.016 +.000 -.005
5.156 +.010 -.010 DIA
5.250 DIA
5.562 DIA
5.687 DIA
-B-
⊕ A .032
1/32
5.800 DIA MAX
5.938 DIA MIN
6.777 DIA (RING)
6.782 DIA MAX (BELLOWS)
6.597 +.010 -.010 DIA
6.540 +.010 -.010 DIA
6.745 DIA
.015 R MAX
.018 +.002 -.002
.016 +.000 -.005

PARTIAL SECTION B-B
SCALE 4:1

PARTIAL SECTION C-C
SCALE 4:1

PARTIAL SECTION D-D
SCALE 4:1

PARTIAL SECTION E-E
SCALE 4:1

VIEW A-A

6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00103 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 4/3/62
MIT APPROVAL 21 NOV 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

CODE IDENT NO
SIZE J
1899951
SCALE 1:1
SHEET

1899951

F-3

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:
1 ▷ QQ-S-763 CL321 STAINLESS STEEL.
2 ▷ MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:
(A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.
3 ▷ (C) INERT HELI-ARC WELD ITEMS (3|4|5|6) TO ITEM (1) AND WELD ITEMS (3|4|5|6) TO ITEM (2) PER MIL-W-8611.
(D) WELDS TO BE INSPECTED PER MIL-I-6866.

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
2. SURFACE ROUGHNESS NOT TO EXCEED 125√.

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156#/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER AND SERIAL NUMBER AT THE INDICATED LOCATION PER MIL-STD-130 (NAMEPLATE PERMISSIBLE).
(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)
J5 4 ▷ (M) THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

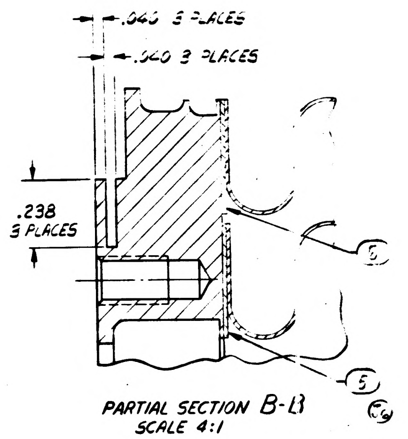
FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

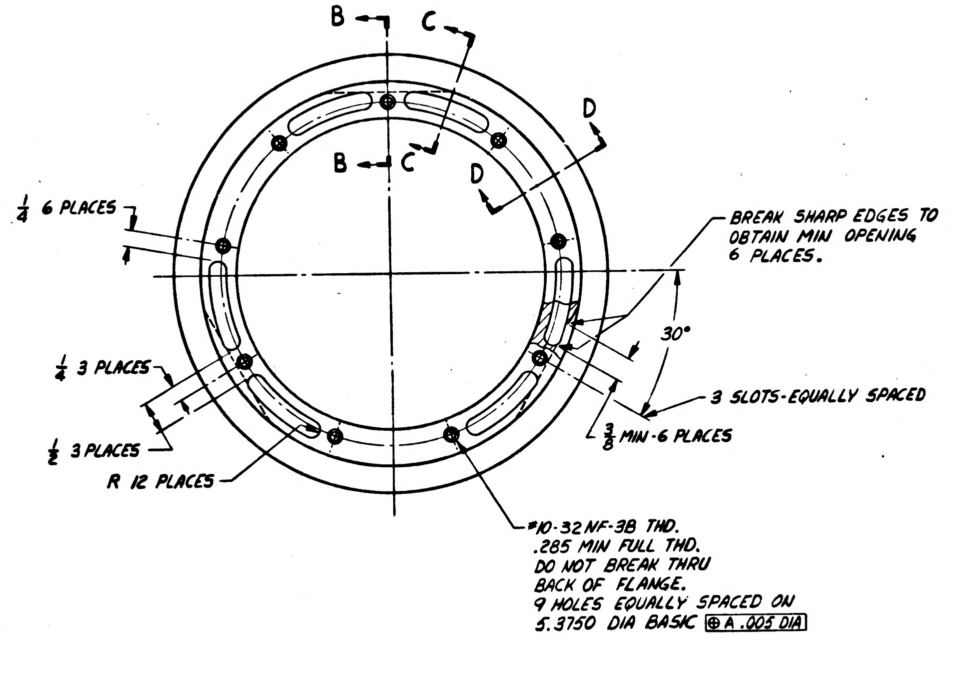
(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
(D) TEMPERATURE - +300°F TO -200°F.
(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

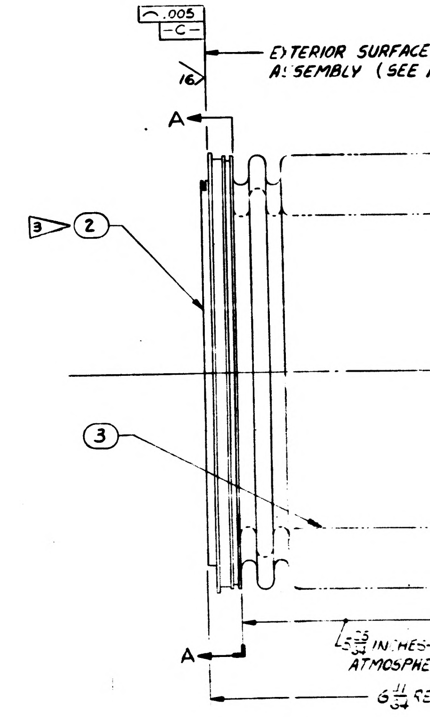
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:
(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.

(B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
(C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

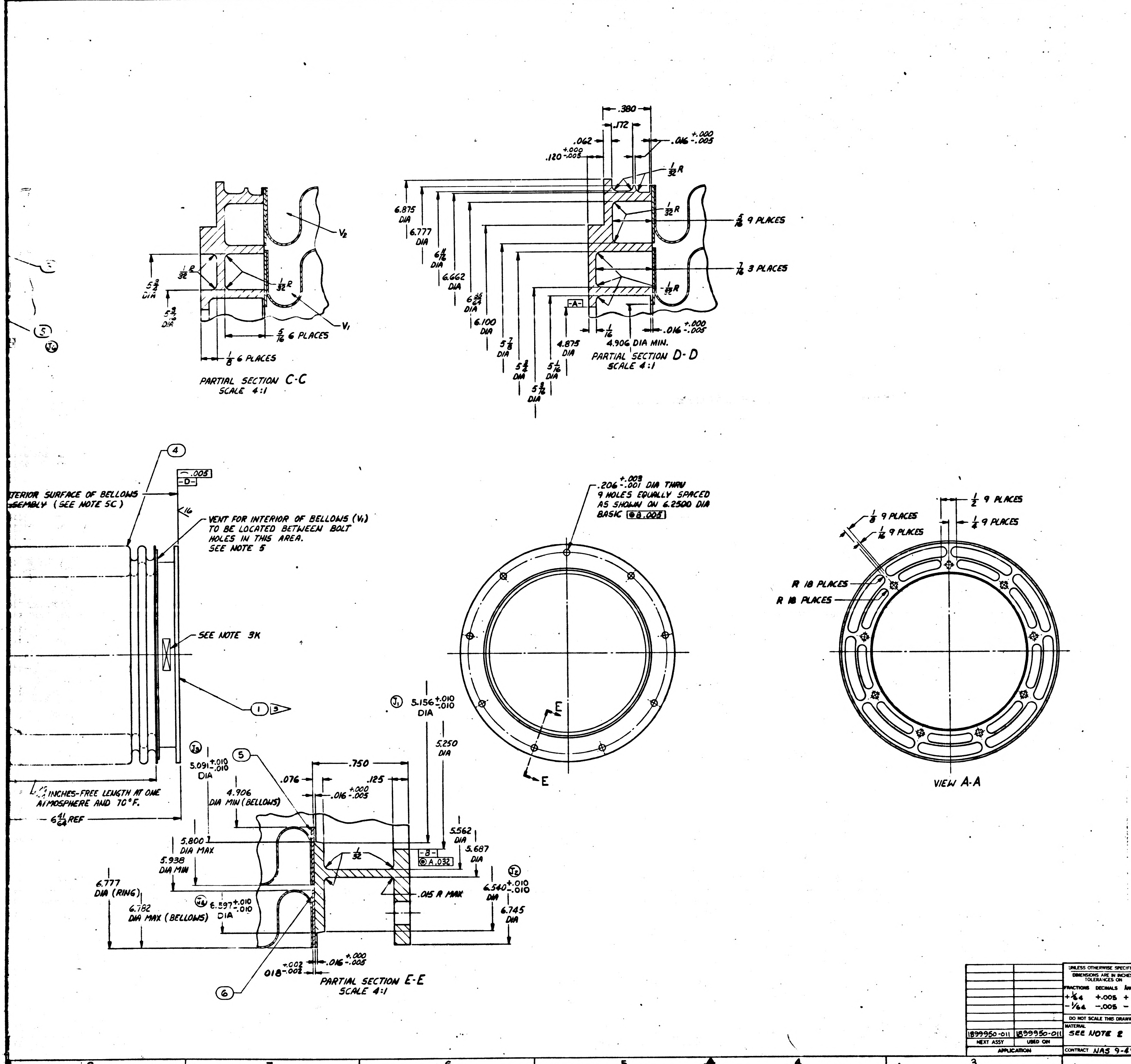


PARTIAL SECTION B-B
SCALE 4:1





INCHES
PHOTOGRAPHIC SCALE ONLY



PARTIAL SECTION C-C
SCALE 4:1
V2
V1
1/32 R
1/32 R
5 3/4 DIA
5 9/16 DIA
5/16 6 PLACES
1/8 6 PLACES
PARTIAL SECTION D-D
SCALE 4:1
.380
.172
.062
.120 +.000 -.005
.016 +.000 -.005
1/32 R
5/16 9 PLACES
7/16 3 PLACES
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 3/16 DIA
4.875 DIA
-A-
1/16
4.906 DIA MIN.
.016 +.000 -.005
④
⌒ .005
-D-
16
INTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
SEE NOTE 3K
① 3
⑤
L INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ .003
E
E
1/2 9 PLACES
1/4 9 PLACES
1/8 9 PLACES
1/16 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A
PARTIAL SECTION E-E
SCALE 4:1
5.156 +.010 -.010 DIA
5.250 DIA
5.091 +.010 -.010 DIA
.750
.076
.125
4.906 DIA MIN (BELLOWS)
.016 +.000 -.005
5.800 DIA MAX
5.938 DIA MIN
1/32
-B-
⊚ A .032
5.562 DIA
5.687 DIA
6.540 +.010 -.010 DIA
6.745 DIA
.015 R MAX
6.777 DIA (RING)
6.782 DIA MAX (BELLOWS)
6.597 +.010 -.010 DIA
.018 +.002 -.002
.016 +.000 -.005
⑥

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
Ⓜ H		UPGRADED FOR CLASS A RELEASE TDRR 0[illegible]6		27 APR. 63	A.J.F. WK
J6		REVISED IN ACCORDANCE WITH TDRR 01498			WK
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 July 63	R.W.G. WK
L		REVISED IN ACCORDANCE WITH TDRR 02514		20 AUG 63	R.W.G. E.E.L.

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

1899951

[redacted]

[redacted] TDR No. 00103 DATE

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+ -
- 1/64	-.005	- -

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 NOV 62
NASA APPROVAL 11/21/62
MIT APPROVAL 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

▷1 QQ-S-763 CL321 STAINLESS STEEL.

▷2 MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:

(A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

▷3 (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611.

(D) WELDS TO BE INSPECTED PER MIL-I-6866.

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015R OR CHAMFER
2. SURFACE ROUGHNESS NOT TO EXCEED 125/

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156#/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER MIL-STD-130 (NAMEPLATE PERMISSIBLE).*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)

▷4 (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

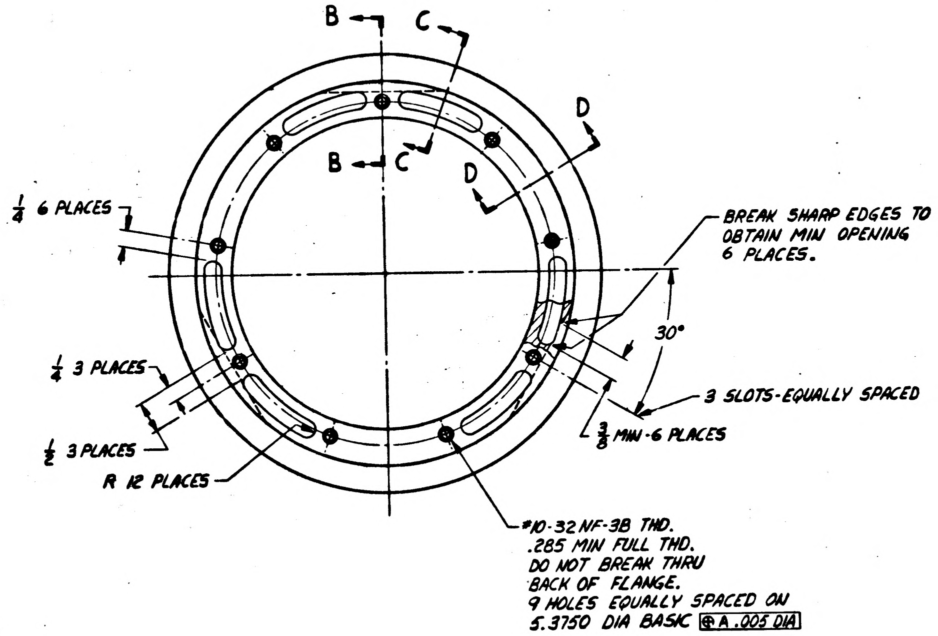
(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

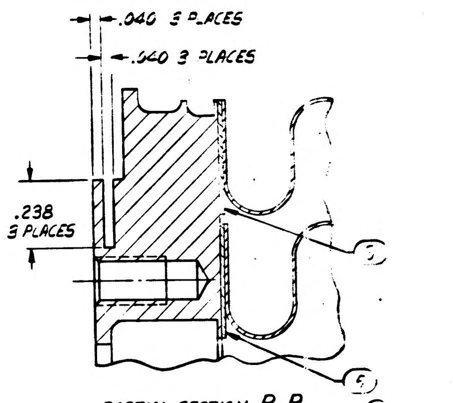
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:

(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.

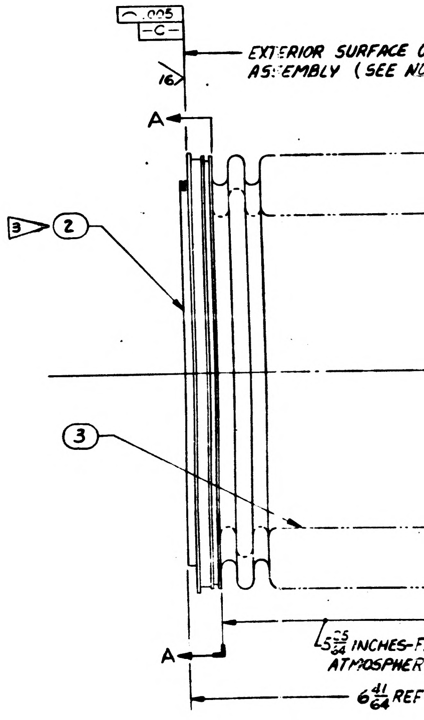
(B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

(C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.



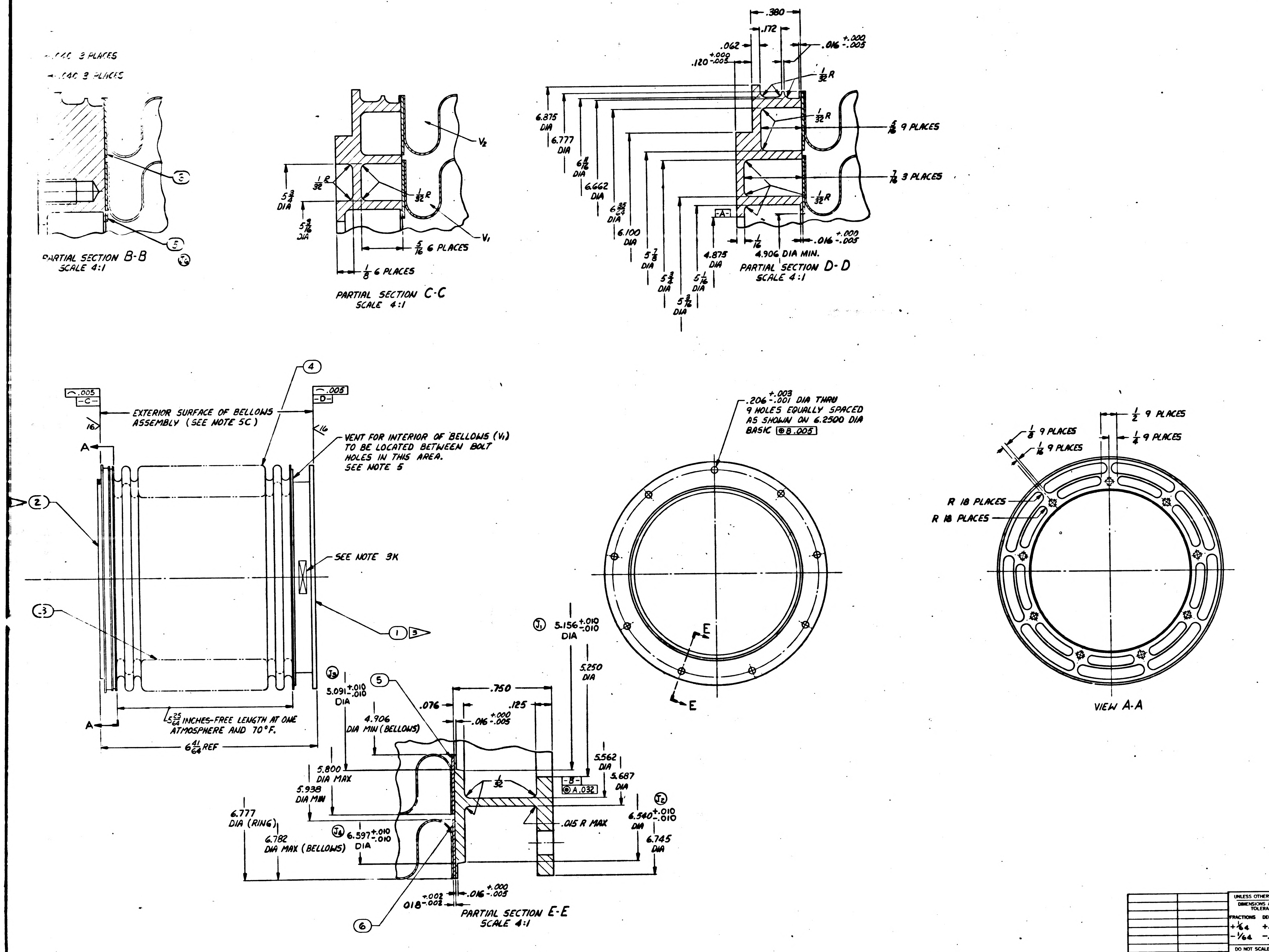


PARTIAL SECTION B-B
SCALE 4:1



INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE		27-APR-63	J.J.F.
J		REVISED IN ACCORDANCE WITH TDRR 01498			
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 July 63	R.W.G.
L		REVISED IN ACCORDANCE WITH TDRR 02514		20 AUG 63	R.W.G.
M		REVISED PER TDRR NO. 03671		21 OCT 63	


.040 3 PLACES
.040 3 PLACES
PARTIAL SECTION B-B
SCALE 4:1
$5\frac{3}{4}$ DIA
$5\frac{9}{16}$ DIA
$\frac{1}{32}$R
$\frac{1}{32}$R
V2
V1
$\frac{5}{16}$ 6 PLACES
$\frac{1}{8}$ 6 PLACES
PARTIAL SECTION C-C
SCALE 4:1
.380
.172
.062
.120 +.000 -.005
.016 +.000 -.005
$\frac{1}{32}$R
$\frac{5}{16}$ 9 PLACES
$\frac{7}{16}$ 3 PLACES
6.875 DIA
6.777 DIA
$6\frac{11}{16}$ DIA
6.662 DIA
$6\frac{35}{64}$ DIA
6.100 DIA
$5\frac{7}{8}$ DIA
$5\frac{3}{4}$ DIA
$5\frac{1}{16}$ DIA
$5\frac{3}{8}$ DIA
4.875 DIA
-A-
$\frac{1}{16}$
4.906 DIA MIN.
.016 +.000 -.005
PARTIAL SECTION D-D
SCALE 4:1
⌒ .005 -C-
⌒ .005 -D-
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
SEE NOTE 3K
A
A
$5\frac{25}{64}$ INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
$6\frac{41}{64}$ REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
E
$\frac{1}{8}$ 9 PLACES
$\frac{1}{16}$ 9 PLACES
$\frac{1}{2}$ 9 PLACES
$\frac{1}{4}$ 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A
5.156 +.010 -.010 DIA
5.250 DIA
5.091 +.010 -.010 DIA
4.906 DIA MIN (BELLOWS)
.076
.750
.125
.016 +.000 -.005
5.800 DIA MAX
5.938 DIA MIN
5.562 DIA
5.687 DIA
$\frac{1}{32}$
-B- ⊚ A .032
.015 R MAX
6.540 +.010 -.010 DIA
6.745 DIA
6.777 DIA (RING)
6.782 DIA MAX (BELLOWS)
6.597 +.010 -.010 DIA
.018 +.002 -.002
.016 +.000 -.005
PARTIAL SECTION E-E
SCALE 4:1
①
②
③
④
⑤
⑥

6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

[redacted]

[redacted] TDR No. 00103 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES + - - -
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 4/2/62
MIT APPROVAL 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

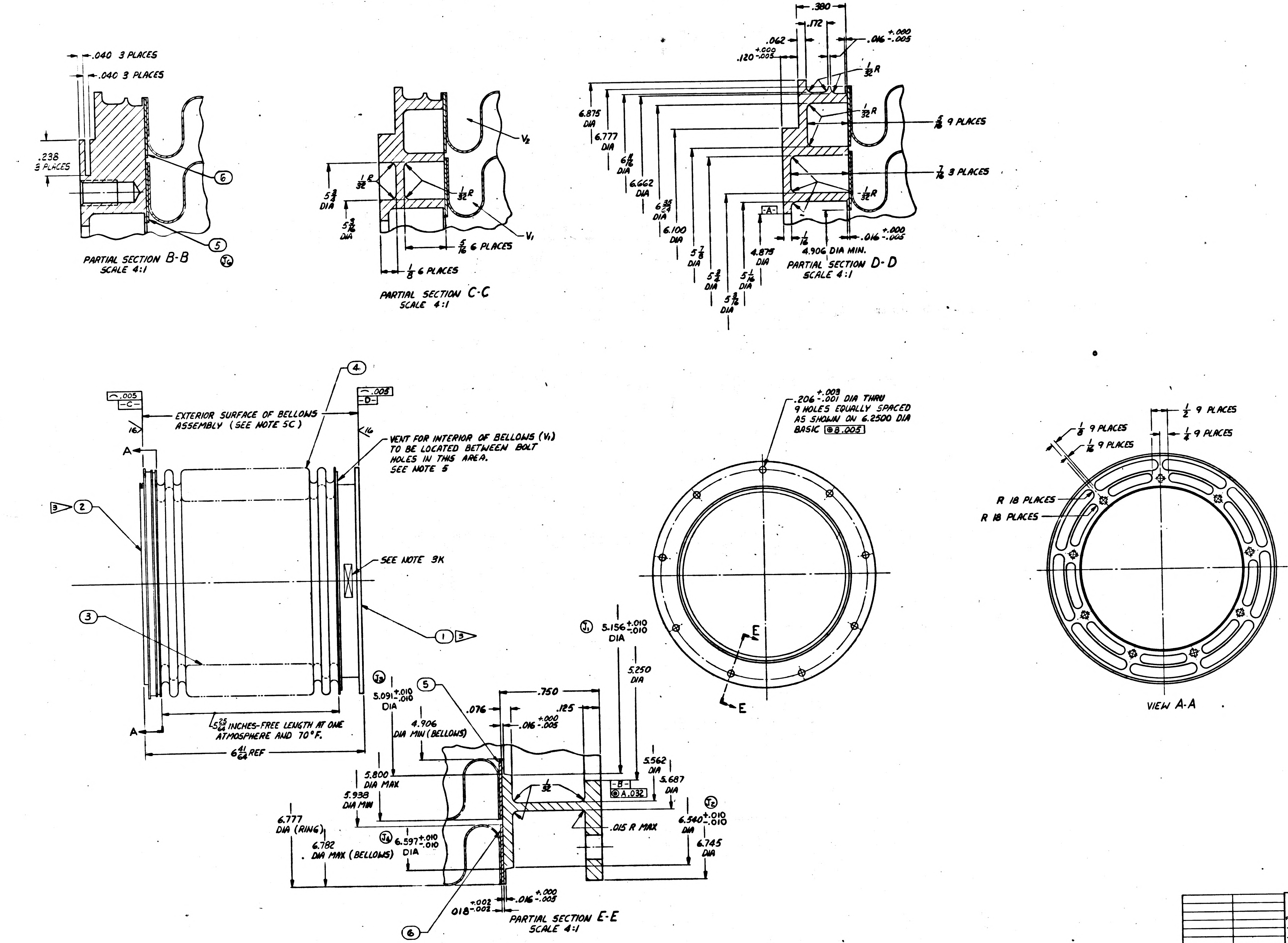
CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

1899951

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE THROUGH		[illegible]	A.J.F. wk
J6		REVISED IN ACCORDANCE WITH TDRR 01498			wk
K		REVISED IN ACCORDANCE WITH TDRR 02308		[illegible]	R.H.C. wk
L		REVISED IN ACCORDANCE WITH TDRR 02514		[illegible] 63	R.H.S.
M		REVISED PER TDRR NO. 03671		2 OCT 63	

SHARP EDGES TO
MIN OPENING
ES.

EQUALLY SPACED



.040 3 PLACES
.040 3 PLACES
.238
3 PLACES
6
5
PARTIAL SECTION B-B
SCALE 4:1
J6
V2
$\frac{1}{32}$R
$\frac{1}{32}$R
$5\frac{3}{4}$ DIA
$5\frac{3}{16}$ DIA
V1
$\frac{5}{16}$ 6 PLACES
$\frac{1}{8}$ 6 PLACES
PARTIAL SECTION C-C
SCALE 4:1
.380
.172
.062
.120 +.000 -.005
.016 +.000 -.005
$\frac{1}{32}$R
$\frac{1}{32}$R
$\frac{5}{16}$ 9 PLACES
$\frac{7}{16}$ 3 PLACES
$\frac{1}{32}$R
6.875 DIA
6.777 DIA
$6\frac{11}{16}$ DIA
6.662 DIA
$6\frac{35}{64}$ DIA
6.100 DIA
$5\frac{7}{8}$ DIA
$5\frac{3}{4}$ DIA
$5\frac{3}{16}$ DIA
$5\frac{1}{16}$ DIA
4.875 DIA
-A-
$\frac{1}{16}$
.016 +.000 -.005
4.906 DIA MIN.
PARTIAL SECTION D-D
SCALE 4:1
4
.005 -C-
.005 -D-
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
16
16
A
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
3 2
SEE NOTE 3K
3
1 3
A
$5\frac{25}{64}$ INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
$6\frac{41}{64}$ REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕.005
E
E
$\frac{1}{2}$ 9 PLACES
$\frac{1}{4}$ 9 PLACES
$\frac{1}{8}$ 9 PLACES
$\frac{1}{16}$ 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A
J1 5.156 +.010 -.010 DIA
5.250 DIA
J3 5.091 +.010 -.010 DIA
5
.750
.076
.125
4.906 DIA MIN (BELLOWS)
.016 +.000 -.005
5.800 DIA MAX
5.938 DIA MIN
$\frac{1}{32}$
5.562 DIA
5.687 DIA
-B-
◎ A .032
.015 R MAX
J2 6.540 +.010 -.010 DIA
6.745 DIA
6.777 DIA (RING)
6.782 DIA MAX (BELLOWS)
J4 6.597 +.010 -.010 DIA
.018 +.002 -.002
.016 +.000 -.005
6
PARTIAL SECTION E-E
SCALE 4:1

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

[redacted]

[redacted] TDR No. OC103 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+ -
$-\frac{1}{64}$	-.005	- -

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 NOV 62
NASA APPROVAL 11/2/62
MIT APPROVAL W. Kupfer 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSY SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

1899951 M

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F-2

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:
▷1 QQ-S-763 CL321 STAINLESS STEEL.
▷2 MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:
(A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.
▷3 (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611.
(D) WELDS TO BE INSPECTED PER MIL-I-6866.

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
2. SURFACE ROUGHNESS NOT TO EXCEED 125√.

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF 5/16 INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156#/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE).*
(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)
J5 ▷4 (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±1/4 INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

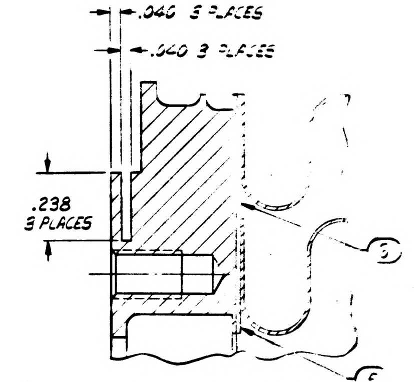
SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

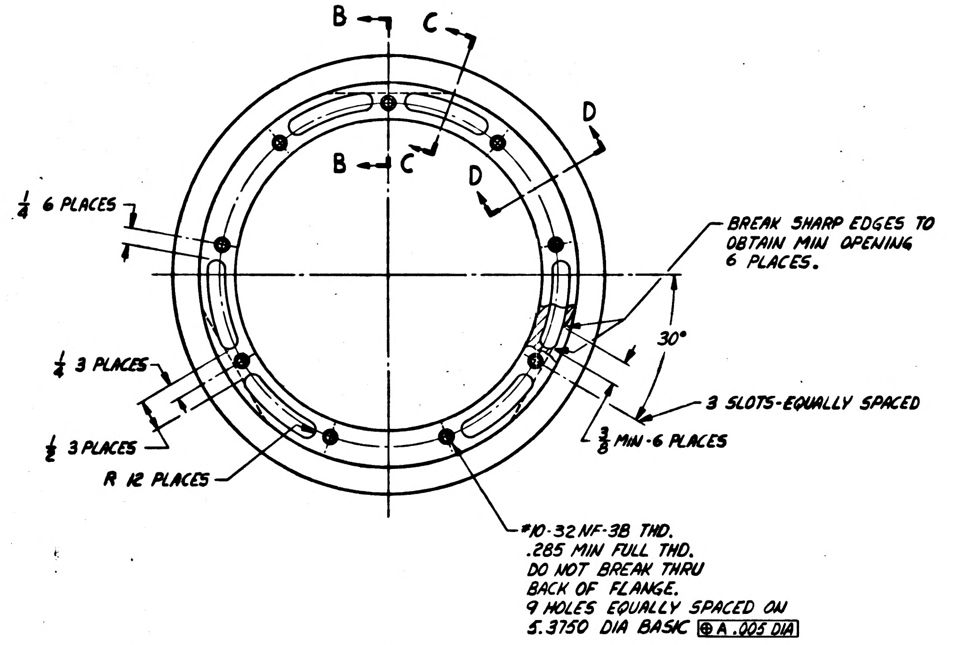
RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

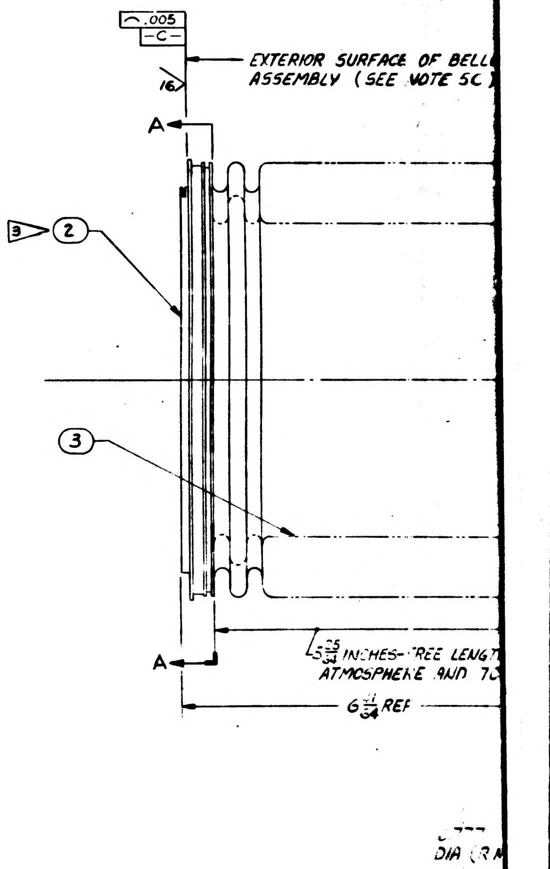
(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
(D) TEMPERATURE - +300°F TO -200°F.
(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:
(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.
(B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
(C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.



PARTIAL SECTION B-B
SCALE 4:1

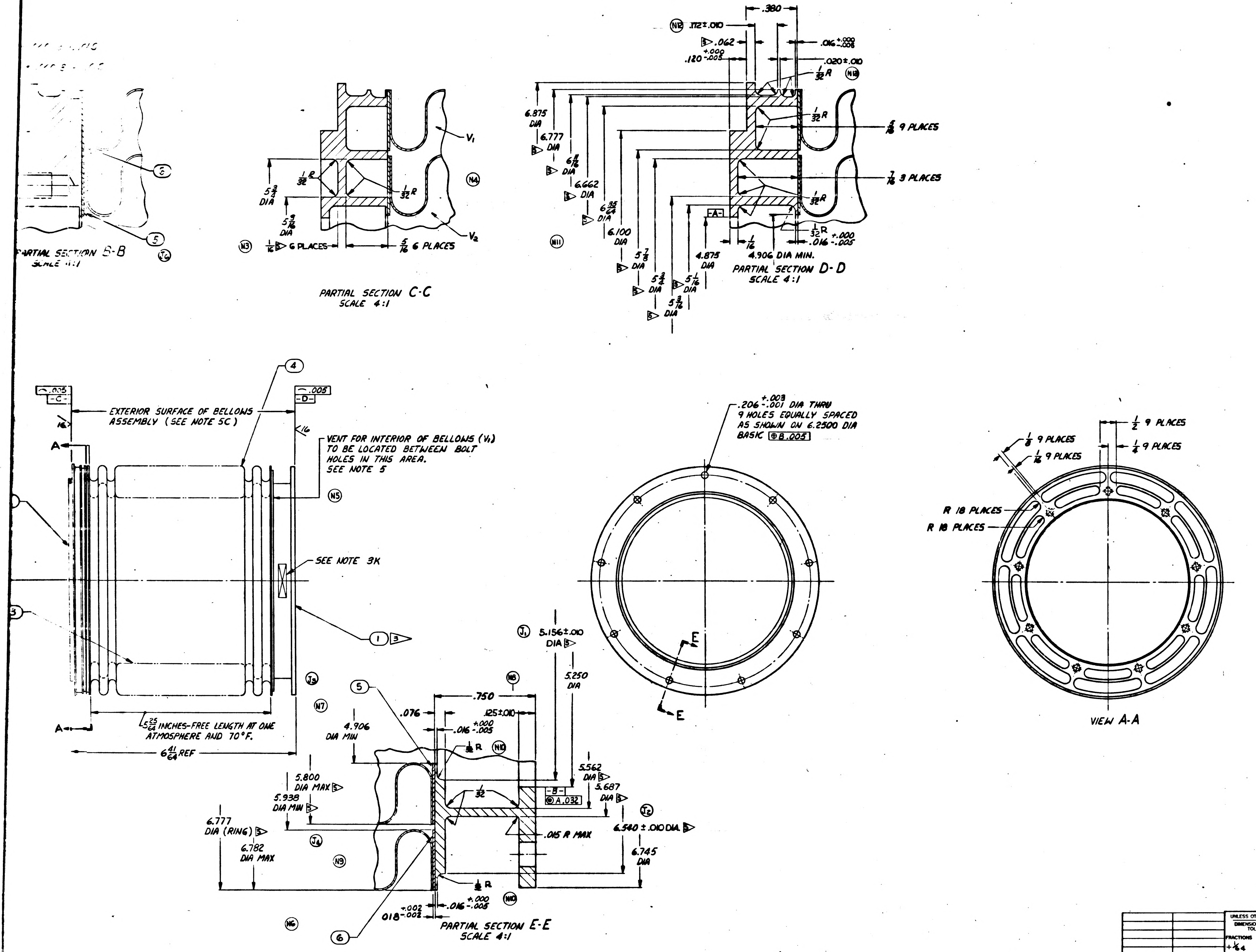




INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE TDRR 01026		22 APR 63	A.J.F.
J6		REVISED IN ACCORDANCE WITH TDRR 01498			
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 July 63	R.W.G.
L		REVISED IN ACCORDANCE WITH TDRR 02514		23 AUG 63	R.W.G.
M		REVISED PER TDRR NO. 03671		21 OCT 63	
N13		REVISED PER TDRR NO. 04948		11 DEC. 63	

REVISIONS


PARTIAL SECTION B-B
SCALE 4:1
6
5
J6
5 3/4 DIA
5 9/16 DIA
1/32 R
1/32 R
1/16 6 PLACES
5/16 6 PLACES
V1
V2
N3
N4
N11
.380
.112 ±.010
.062
.016 +.000 -.005
.120 +.000 -.005
.020 ±.010
1/32 R
N12
N13
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 9/16 DIA
4.875 DIA
4.906 DIA MIN.
5/8 9 PLACES
7/8 3 PLACES
-A-
1/16
1/32 R
.016 +.000 -.005
.005 -C-
.005 -D-
A
16
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
4
N5
SEE NOTE 3K
3
1
J2
N7
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
1/8 9 PLACES
1/16 9 PLACES
1/2 9 PLACES
1/4 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A
J1
5.156 ±.010 DIA
5.250 DIA
N8
.750
.076
.125 ±.010
.016 +.000 -.005
4.906 DIA MIN
1/32 R
N10
5.800 DIA MAX
5.938 DIA MIN
5.562 DIA
5.687 DIA
-B-
◎ A .032
1/32
.015 R MAX
J2
6.540 ±.010 DIA.
6.745 DIA
6.777 DIA (RING)
6.782 DIA MAX
J6
N9
N6
1/32 R
.018 +.002 -.002
.016 +.000 -.005
N10
PARTIAL SECTION E-E
SCALE 4:1
PARTIAL SECTION C-C
SCALE 4:1
PARTIAL SECTION D-D
SCALE 4:1

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

[redacted]

[redacted] TDR No. 00103 DATE

1899950-011	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES + - - - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN L. COOPER DATE 12 NOV 62 CHECKED 14 NOV 62 APPROVAL 14 Nov 62 APPROVAL 14 Nov 62	MANNED SPACECRAFT CENTER HOUSTON, TEXAS BELLOWS ASSEMBLY, SCT
NEXT ASSY	USED ON	MATERIAL SEE NOTE 2	NASA APPROVAL 1/2/63 MIT APPROVAL 21 NOV 62	CODE IDENT NO. SIZE J 1899951
APPLICATION		CONTRACT NAS 9-497		SCALE 1:1 SHEET

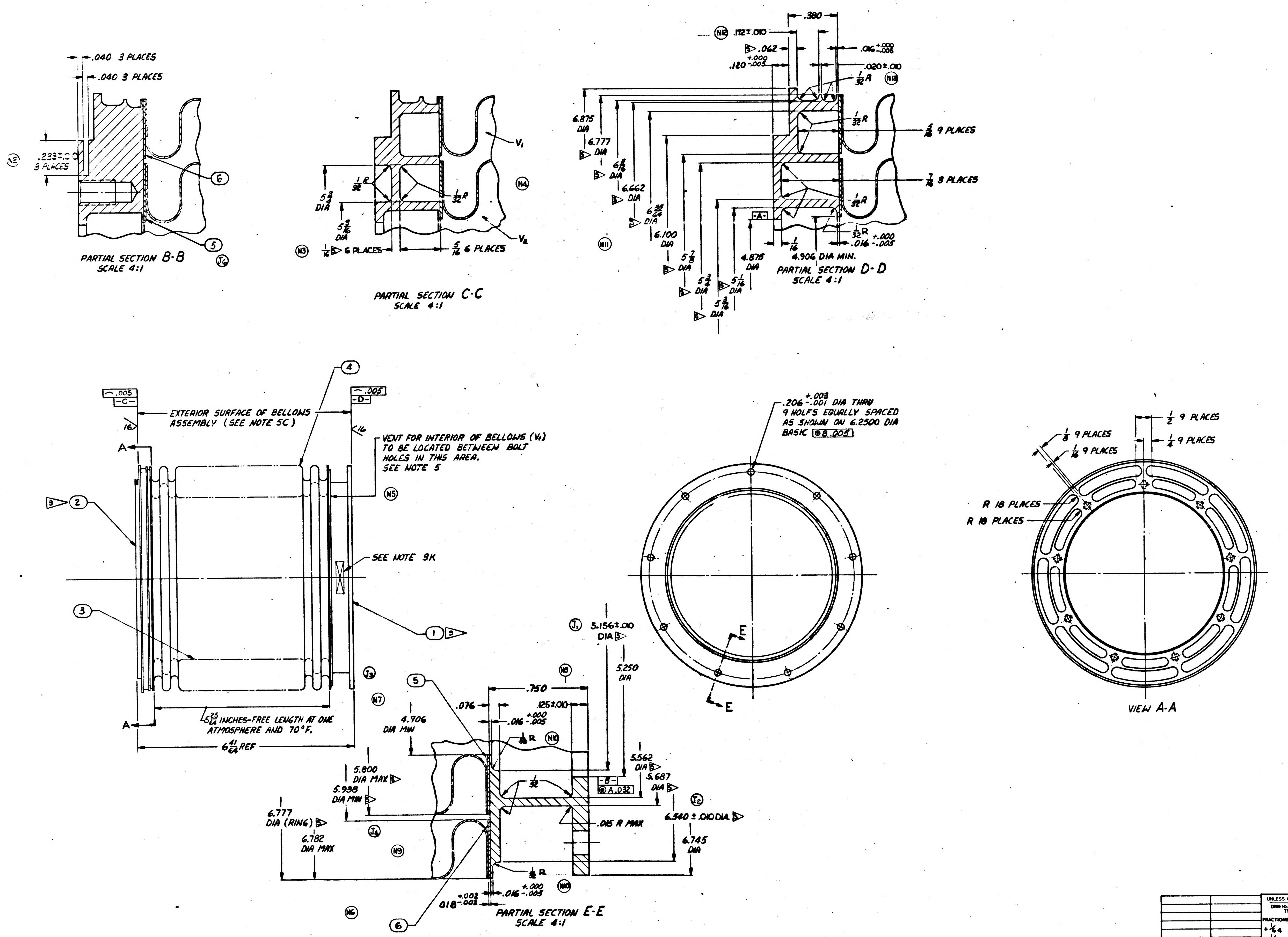
1899951

SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
J		UPGRADED FOR CLASS A RELEASE [illegible]		[illegible]	A.J.F. / WK
J6		REVISED IN ACCORDANCE WITH TDRR 01498			WK
K		REVISED IN ACCORDANCE WITH TDRR C2308		[illegible]	R.U.S. / WK
L		REVISED IN ACCORDANCE WITH TDRR 02514		[illegible] 63	R.U.G. / [illegible]
M		REVISED PER TDRR NO. 03871		OCT 63	N
N13		REVISED PER TDRR NO. 04943		DEC. 63	[illegible]

REVISIONS

HARP EDGES TO
MIN OPENING
5.

UALLY SPACED


.040 3 PLACES
.040 3 PLACES
N2
.233±.0[illegible] 3 PLACES
6
5
J6
N3
1/16 6 PLACES
5/16 6 PLACES
1/32 R
1/32 R
5 3/4 DIA
5 9/16 DIA
V1
V2
N4
N12 .112±.010
.380
.062
.016 +.000 -.005
.120 +.000 -.005
.020±.010
1/32 R
N13
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 3/16 DIA
5 1/16 DIA
4.875 DIA
-A-
1/16
4.906 DIA MIN.
1/32 R
.016 +.000 -.005
5/16 9 PLACES
7/16 3 PLACES
N11
.005 -C-
.005 -D-
4
16
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
N5
A
2
SEE NOTE 3K
3
1
J3
A
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
E
1/2 9 PLACES
1/8 9 PLACES
1/4 9 PLACES
1/16 9 PLACES
R 18 PLACES
R 18 PLACES
J1
5.156±.010 DIA
5.250 DIA
N8
N7
5
.750
.076
.125±.010
.016 +.000 -.005
4.906 DIA MIN
1/64 R
N10
5.562 DIA
5.687 DIA
5.800 DIA MAX
5.938 DIA MIN
1/32
-B-
◎ A .032
J2
6.777 DIA (RING)
6.782 DIA MAX
J4
N9
.015 R MAX
6.540 ±.010 DIA
6.745 DIA
1/64 R
N10
.016 +.000 -.005
.018 +.002 -.002
N6
6

PARTIAL SECTION B-B
SCALE 4:1

PARTIAL SECTION C-C
SCALE 4:1

PARTIAL SECTION D-D
SCALE 4:1

VIEW A-A

PARTIAL SECTION E-E
SCALE 4:1

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2> 4>
5	2	1899951-5	RING, ADAPTER, INNER 2>
4	1	1899951-4	BELLOWS, OUTER 2>
3	1	1899951-3	BELLOWS, INNER 2>
2	1	1899951-2	S/C END RINGS 1>
1	1	1899951-1	OPTICS END RING 1>

LIST OF PARTS AND MATERIALS

[redacted] INFORMATION [redacted]

[redacted] TDR No. 0010 DATE

1899950-011	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES + - - - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN L. COOPER DATE 12 NOV 62 CHECKED [illegible] 14 NOV 62 APPROVAL [illegible] 14 Nov 62 APPROVAL [illegible] 14 Nov 62
NEXT ASSY	USED ON	MATERIAL SEE NOTE 2	NASA APPROVAL [illegible] 1/2/62
APPLICATION		CONTRACT NAS 9-497	MIT APPROVAL [illegible] 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

[illegible]

CODE IDENT NO
SIZE
1899951
SCALE 1:1
SHEET

1899951 N

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

2. MATERIAL:

▷1 QQ-S-763 CL321 STAINLESS STEEL.

▷2 MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:

(A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

▷3 (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611.

(D) WELDS TO BE INSPECTED PER MIL-I-6866.

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015R OR CHAMFER
2. SURFACE ROUGHNESS NOT TO EXCEED $\sqrt[125]{}$.

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156 #/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE).*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)

(J5) ▷4 (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE $\pm\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF $.015 G^2$ PER CPS AT 5 CPS WITH A LINEAR INCREASE TO $.19 G^2$ PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO $.06 G^2$ PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

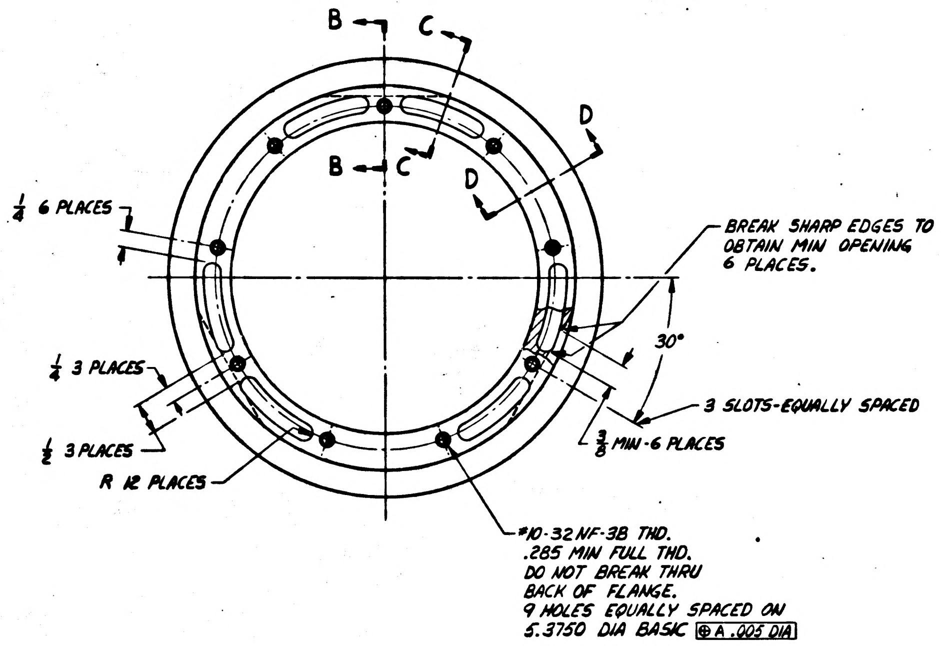
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:

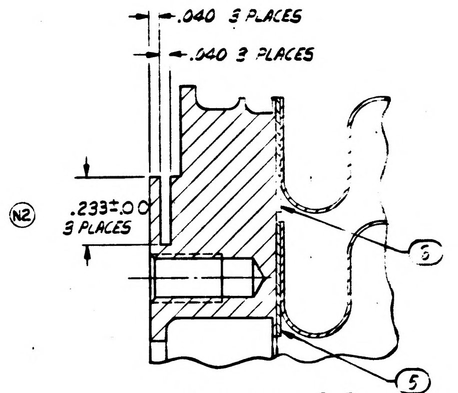
(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.

(B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

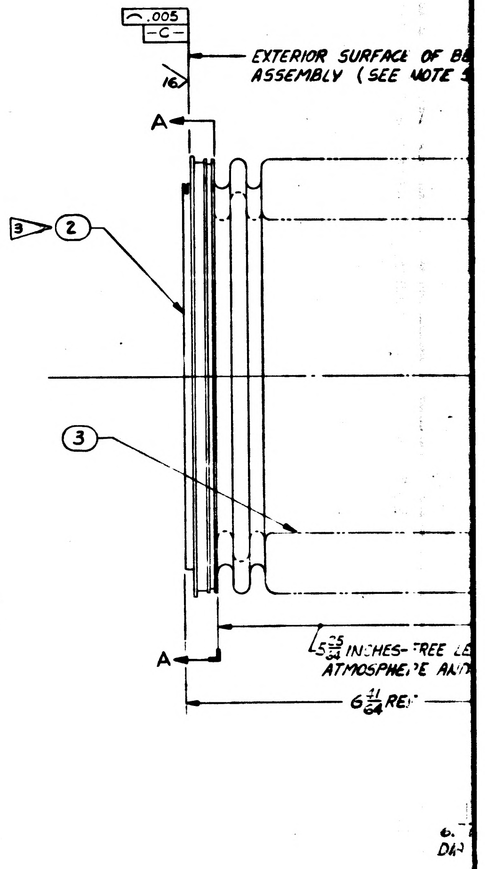
(C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

(N1) ▷5 THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED $\pm\frac{1}{32}$ FROM NOMINAL DIMENSION.

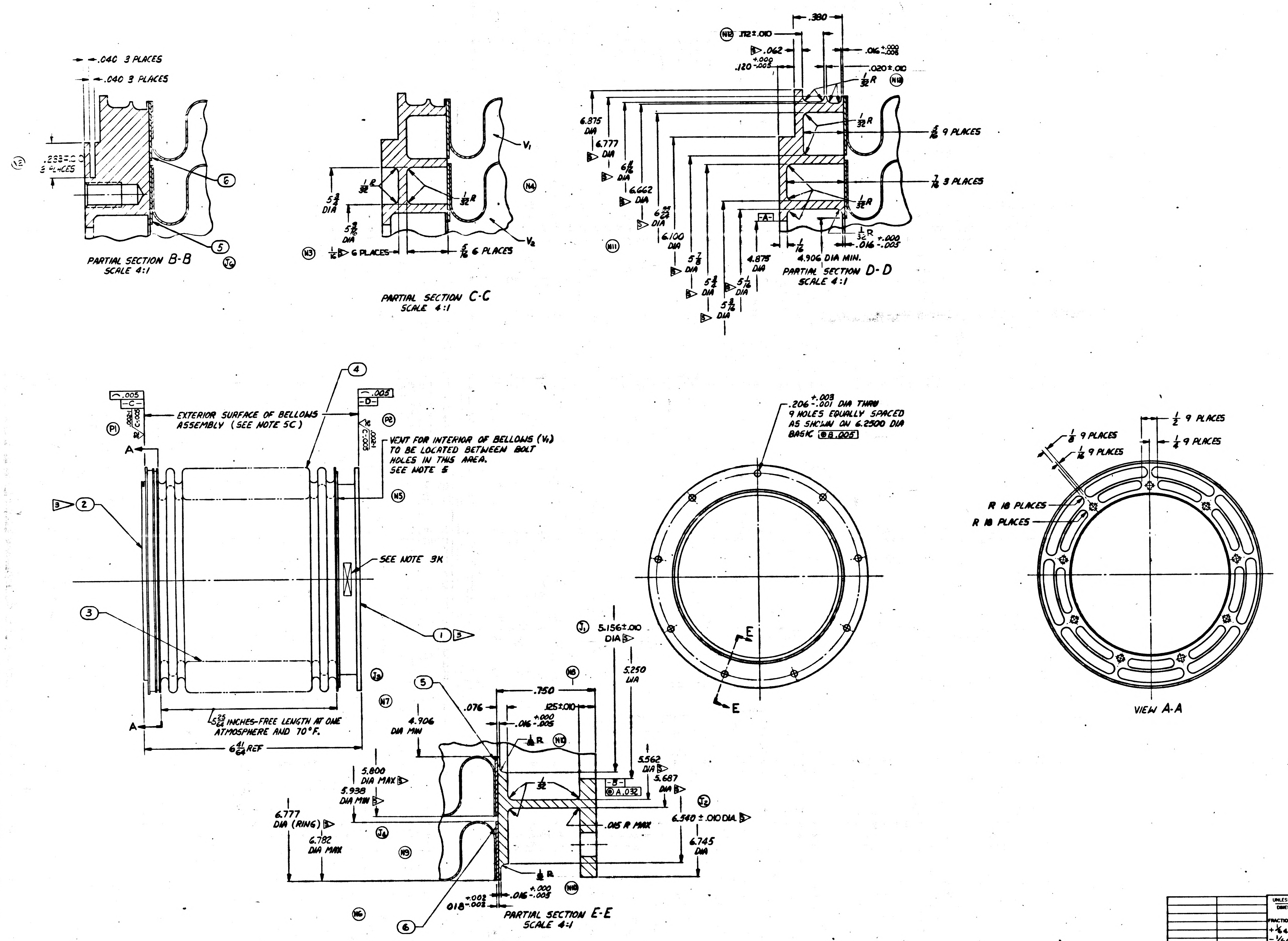

B
C
B
C
D
D
$\frac{1}{4}$ 6 PLACES
BREAK SHARP EDGES TO OBTAIN MIN OPENING 6 PLACES.
30°
$\frac{1}{4}$ 3 PLACES
3 SLOTS-EQUALLY SPACED
$\frac{1}{2}$ 3 PLACES
$\frac{3}{8}$ MIN-6 PLACES
R 12 PLACES
#10-32 NF-3B THD.
.285 MIN FULL THD.
DO NOT BREAK THRU
BACK OF FLANGE.
9 HOLES EQUALLY SPACED ON
5.3750 DIA BASIC ⊕ A .005 DIA


.040 3 PLACES
.040 3 PLACES
(N2)
.233±.00
3 PLACES
6
5
(J6)

PARTIAL SECTION B-B
SCALE 4:1


⌒ .005
-C-
EXTERIOR SURFACE OF BE
ASSEMBLY (SEE NOTE 5
16
A
A
▷3 2
3
$5\frac{25}{64}$ INCHES-FREE LE
ATMOSPHERE AND
$6\frac{41}{64}$ REF
DIA

SYM	ZONE	DESCRIPTION	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE TDRR 01046 CHG.		
J6		REVISED IN ACCORDANCE WITH TDRR 01498		
K		REVISED IN ACCORDANCE WITH TDRR 02308		R.H.S.
L		REVISED IN ACCORDANCE WITH TDRR 02514	63	R.H.S.
M		REVISED PER TDRR NO. 0367	63	
N13		REVISED PER TDRR NO. 04[illegible]	DEC	
P2		REVISED PER TDRR NO. [illegible]		


.040 3 PLACES
.040 3 PLACES
.2830±.010 3 PLACES
6
5
J6
5 3/4 DIA
5 3/16 DIA
1/32 R
1/32 R
V1
V2
N4
N3
1/16 6 PLACES
5/16 6 PLACES
N12 .112±.010
.062
.120 +.000 -.005
.380
.016 +.000 -.005
.020±.010
1/32 R
N12
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 3/16 DIA
4.875 DIA
-A-
N11
5/16 9 PLACES
7/16 3 PLACES
1/32 R
1/16
1/32 R
.016 +.000 -.005
4.906 DIA MIN.
.005
-C-
.002 -1 C .005
P1
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
4
.005
-D-
P2
.002 -1 C .005
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
N5
A
A
3 2
SEE NOTE 3K
3
1 3
J3
N7
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕B.005
E
E
1/2 9 PLACES
1/8 9 PLACES
1/4 9 PLACES
1/16 9 PLACES
R 18 PLACES
R 18 PLACES
5
.076
.750
N8
.125±.010
.016 +.000 -.005
4.906 DIA MIN
R
N10
J1 5.156±.010 DIA
5.250 DIA
5.562 DIA
5.687 DIA
-B-
◎A.032
5.800 DIA MAX
5.938 DIA MIN
1/32
6.777 DIA (RING)
6.782 DIA MAX
J6
N9
.015 R MAX
J2
6.540±.010 DIA.
6.745 DIA
R
N10
.016 +.000 -.005
.018 +.002 -.002
N6
6

PARTIAL SECTION B-B
SCALE 4:1

PARTIAL SECTION C-C
SCALE 4:1

PARTIAL SECTION D-D
SCALE 4:1

VIEW A-A

PARTIAL SECTION E-E
SCALE 4:1

GES TO
UING

NCED

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

1899951

[redacted]

[redacted] TDR No. 00103 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 1/2/62
MIT APPROVAL Nov 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

1899951 P

INCHES
PHOTOGRAPHIC SCALE ONLY

E2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763 CL321 STAINLESS STEEL.

2▷ MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:

(A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

3▷ (C) INERT HELI-ARC WELD ITEMS (3)(4)(5)(6) TO ITEM (1) AND WELD ITEMS (3)(4)(5)(6) TO ITEM (2) PER MIL-W-8611.

(D) WELDS TO BE INSPECTED PER MIL-I-6866.

(E) UNLESS OTHERWISE SPECIFIED:

1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
2. SURFACE ROUGHNESS NOT TO EXCEED 125√.

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156#/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE).*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)

(J5) 4▷ (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - + 300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

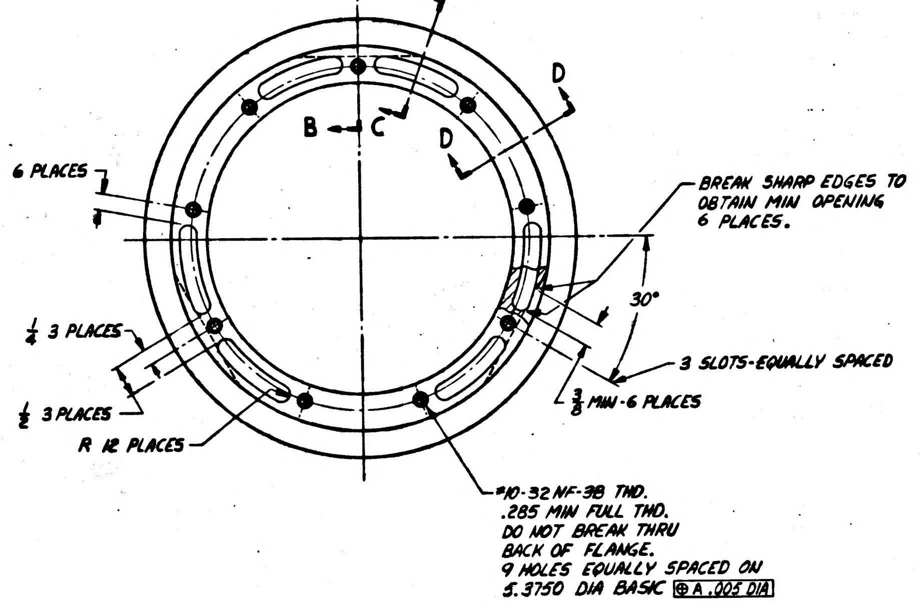
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:

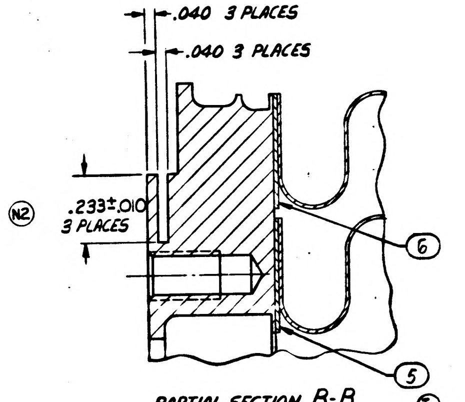
(A) *PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.*

(B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

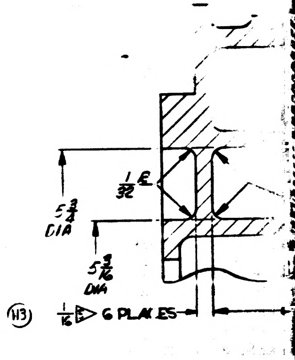
(C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

(N1) 5▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ± $\frac{1}{32}$ FROM NOMINAL DIMENSION.

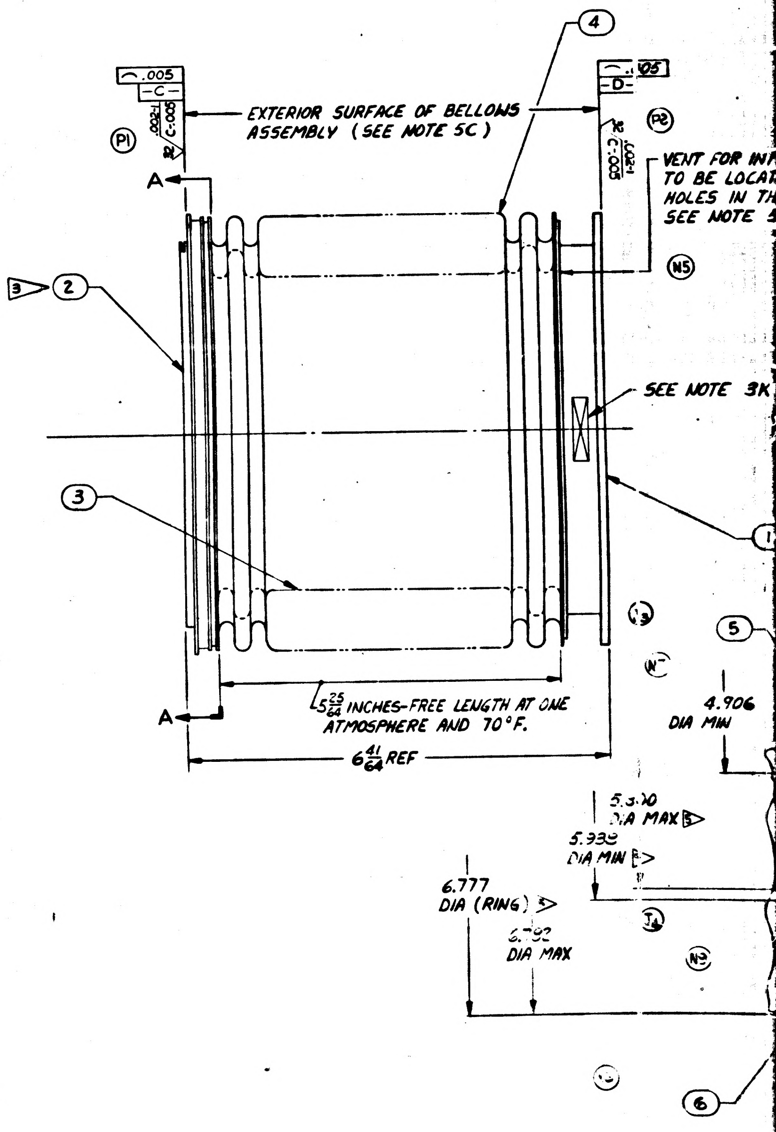

B
C
B
C
D
D
$\frac{1}{4}$ 6 PLACES
$\frac{1}{4}$ 3 PLACES
$\frac{1}{2}$ 3 PLACES
R 12 PLACES
BREAK SHARP EDGES TO OBTAIN MIN OPENING 6 PLACES.
30°
3 SLOTS-EQUALLY SPACED
$\frac{3}{8}$ MIN-6 PLACES
#10-32 NF-3B THD.
.285 MIN FULL THD.
DO NOT BREAK THRU
BACK OF FLANGE.
9 HOLES EQUALLY SPACED ON
5.3750 DIA BASIC ⊕ A .005 DIA


.040 3 PLACES
.040 3 PLACES
(N2)
.233±.010
3 PLACES
6
5
(J6)

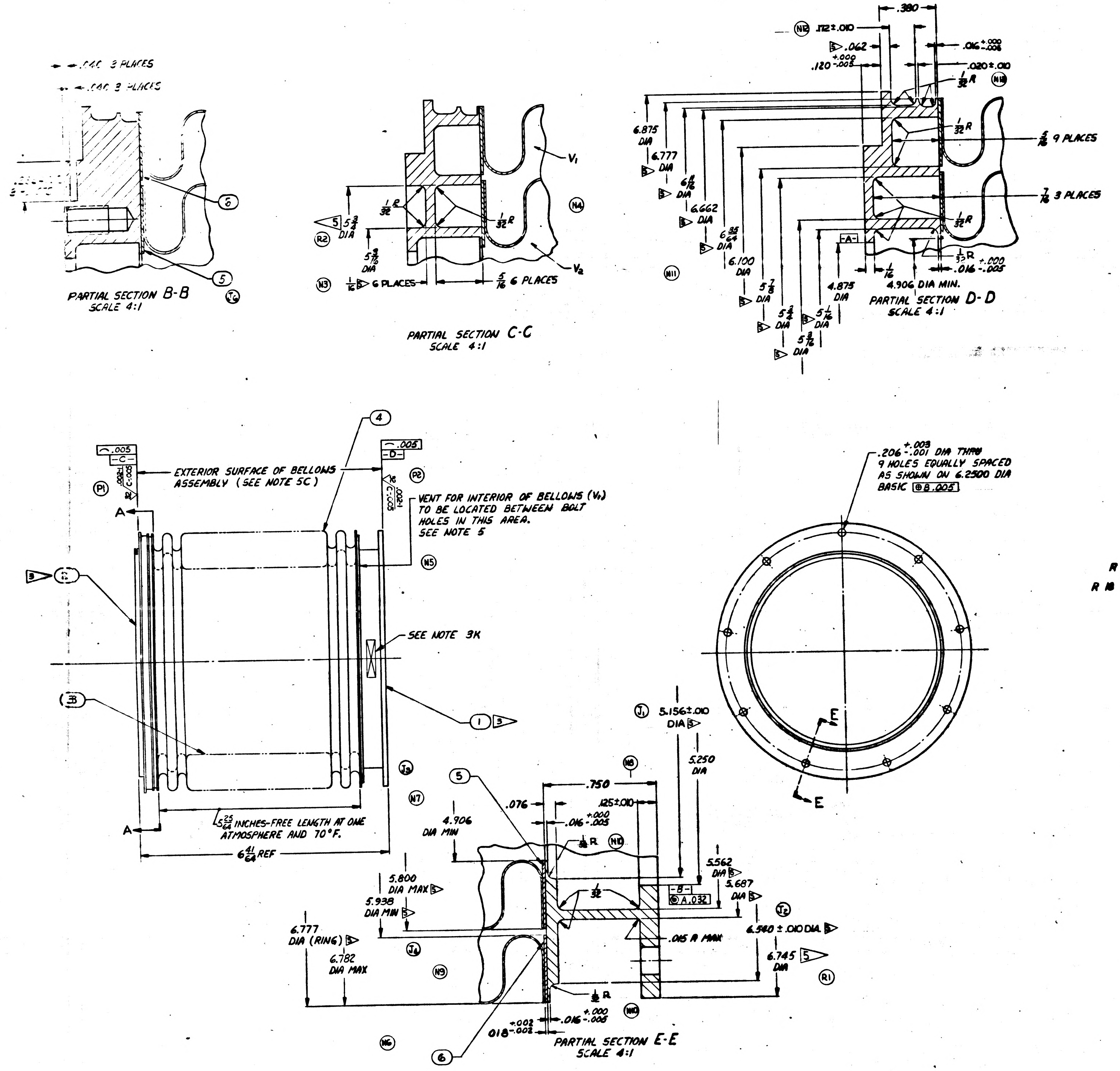
PARTIAL SECTION B-B
SCALE 4:1

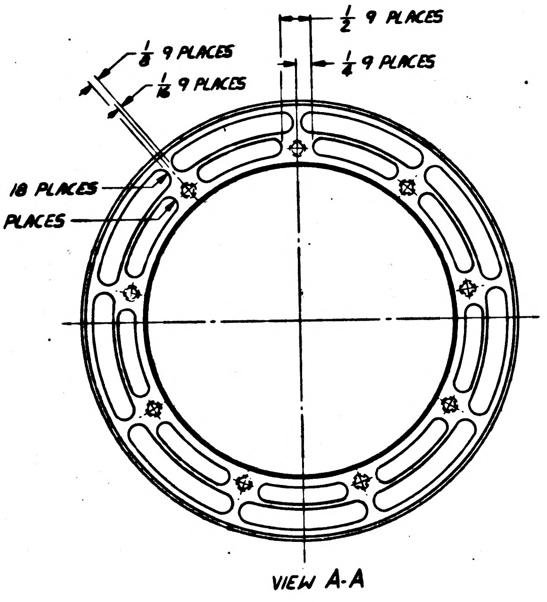

$\frac{1}{32}$
$5\frac{3}{4}$ DIA
$5\frac{3}{16}$ DIA
(N3)
$\frac{1}{16}$ 6 PLACES

PARTIAL SECT
SCALE 4:


4
.005
-C-
.002-1
C-.005
32
(P1)
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
.005
-D-
C-.005
.002-1
32
(P2)
VENT FOR INF
TO BE LOCAT
HOLES IN TH
SEE NOTE
(N5)
A
3▷ 2
SEE NOTE 3K
3
1
5
4.906
DIA MIN
$5\frac{25}{64}$ INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
A
$6\frac{41}{64}$ REF
5.300
DIA MAX 5▷
5.938
DIA MIN 5▷
6.777
DIA (RING) 5▷
6.792
DIA MAX
(J4)
(N3)
6

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE TDRR 01016		27-APR-63	A.J.F. WK
J6		REVISED IN ACCORDANCE WITH TDRR 01498			WK
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 July 63	R.W.G. WK
L		REVISED IN ACCORDANCE WITH TDRR 02514		22 Aug 63	R.W.G.
M		REVISED PER TDRR NO. 03671		2 OCT 63	
N13		REVISED PER TDRR NO. 04948		DEC. 63	
P2		REVISED PER TDRR NO. 05374		JAN 64	
R2		REVISED PER TDRR NO. 05725		2 JAN 64	


CAC 3 PLACES
CAC 3 PLACES
6
5
PARTIAL SECTION B-B
SCALE 4:1
V1
V2
N4
1/32 R
1/32 R
5 3/4 DIA
5 5/16 DIA
R2
N3
1/16 6 PLACES
5/16 6 PLACES
PARTIAL SECTION C-C
SCALE 4:1
.380
N12 .112±.010
.062
.016 +.000 -.005
.120 +.000 -.005
.020±.010
1/32 R
N12
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 3/16 DIA
5 1/16 DIA
4.875 DIA
-A-
1/16
4.906 DIA MIN.
.016 +.000 -.005
5/16 9 PLACES
7/16 3 PLACES
N11
PARTIAL SECTION D-D
SCALE 4:1
4
.005
-C-
.005
-D-
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
P1
P2
A
A
N5
SEE NOTE 3K
3
1
J3
N7
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕B.005
E
E
J1
5.156±.010 DIA
5.250 DIA
N8
5
.750
.076
.125±.010
.016 +.000 -.005
4.906 DIA MIN
1/32 R
N10
5.562 DIA
5.687 DIA
-B-
◎A.032
5.800 DIA MAX
5.938 DIA MIN
6.777 DIA (RING)
6.782 DIA MAX
J2
6.540 ±.010 DIA.
.015 R MAX
6.745 DIA
R1
J4
N9
N6
1/32 R
.016 +.000 -.005
N10
.018 +.002 -.002
6
PARTIAL SECTION E-E
SCALE 4:1


1/2 9 PLACES
1/4 9 PLACES
1/8 9 PLACES
1/16 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

1899951

[redacted]

[redacted] TDR No. 00103 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES + -
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 11/21/62
MIT APPROVAL 21 Nov 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY, SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

1899951 F

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763 CL321 STAINLESS STEEL.

2▷ MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:
   - (A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
   - (B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.
   - 3▷ (C) INERT HELI-ARC WELD ITEMS (3)(4)(5)(6) TO ITEM (1) AND WELD ITEMS (3)(4)(5)(6) TO ITEM (2) PER MIL-W-8611.
   - (D) WELDS TO BE INSPECTED PER MIL-I-6866.
   - (E) UNLESS OTHERWISE SPECIFIED:
     1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
     2. SURFACE ROUGHNESS NOT TO EXCEED 125√.
   - (F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
   - (G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156 #/IN.
   - (J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
   - (K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE).*
   - (L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)
   - J5 4▷ (M) THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
   - (A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE $\pm\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

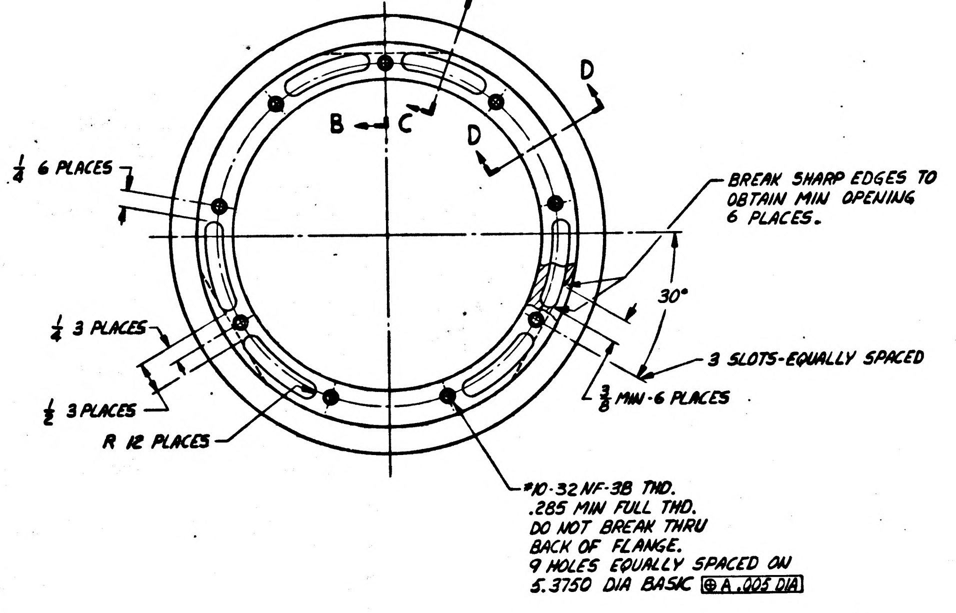
FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

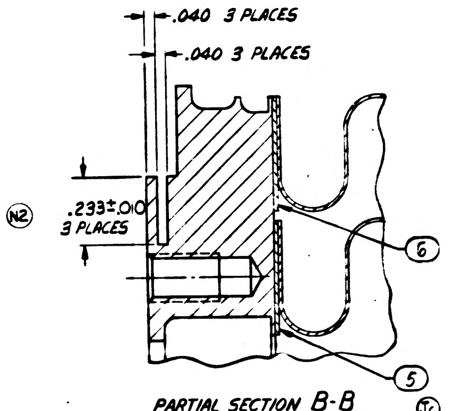
RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

   - (B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
   - (C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
   - (D) TEMPERATURE - +300°F TO -200°F.
   - (E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

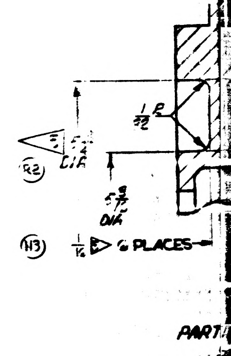
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:
   - (A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.
   - (B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
   - (C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

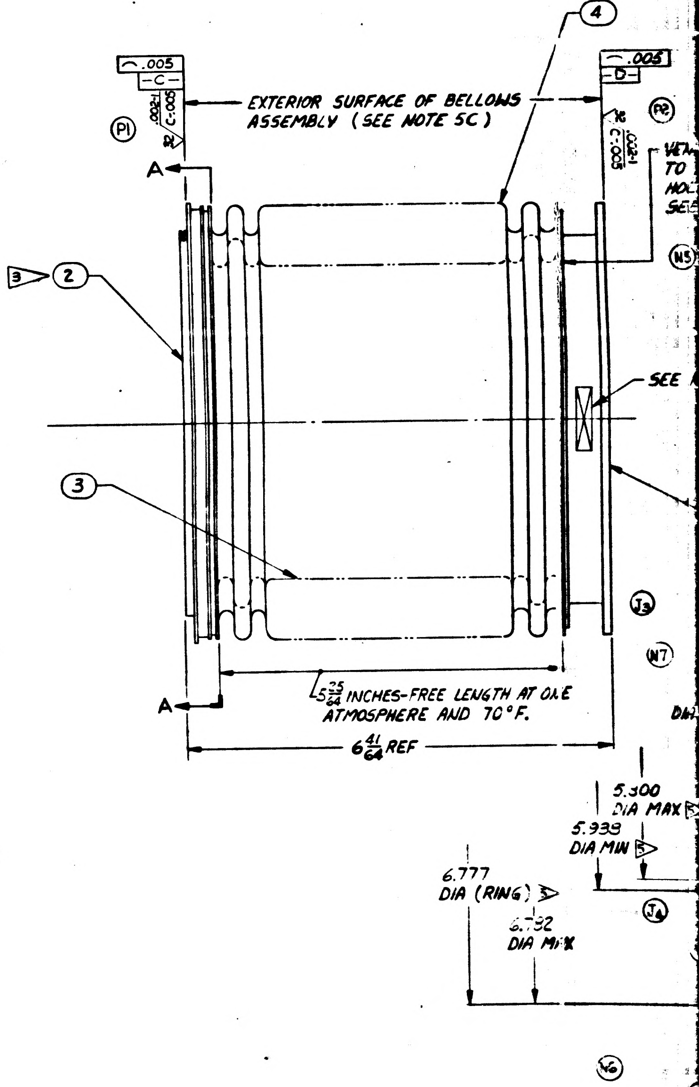
5▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED $\pm\frac{1}{32}$ FROM NOMINAL DIMENSION.


B
C
B
C
D
D
$\frac{1}{4}$ 6 PLACES
BREAK SHARP EDGES TO OBTAIN MIN OPENING 6 PLACES.
30°
$\frac{1}{4}$ 3 PLACES
$\frac{1}{2}$ 3 PLACES
R 12 PLACES
3 SLOTS-EQUALLY SPACED
$\frac{3}{8}$ MIN-6 PLACES
#10-32 NF-3B THD. .285 MIN FULL THD. DO NOT BREAK THRU BACK OF FLANGE. 9 HOLES EQUALLY SPACED ON 5.3750 DIA BASIC ⊕ A .005 DIA


.040 3 PLACES
.040 3 PLACES
N2
.233±.010 3 PLACES
6
5
J6

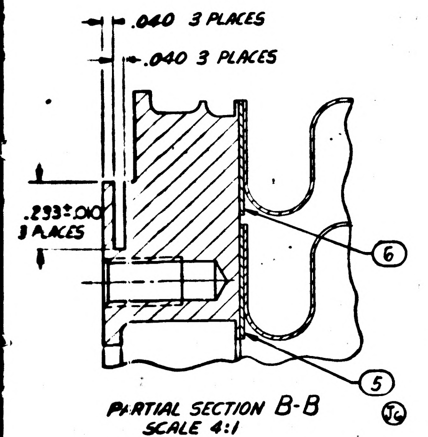
PARTIAL SECTION B-B
SCALE 4:1


R2
$\frac{1}{32}$ R
DIA
DIA
N3
$\frac{1}{16}$ 6 PLACES
PART

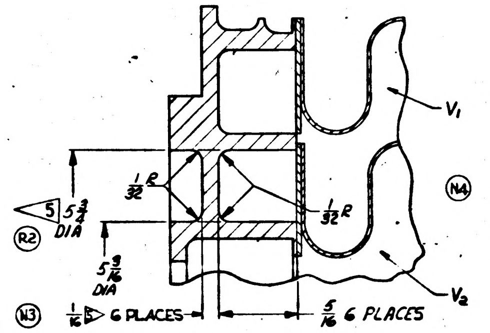

4
.005
-C-
.002-1
C-.005
P1
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
.005
-D-
.002-1
C-.005
P2
A
3▷ 2
N5
SEE
3
J3
N7
$5\frac{35}{64}$ INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
A
$6\frac{41}{64}$ REF
5.300 DIA MAX 5▷
5.939 DIA MIN 5▷
6.777 DIA (RING) 5▷
6.792 DIA MIN
J4
V6

REVISIONS

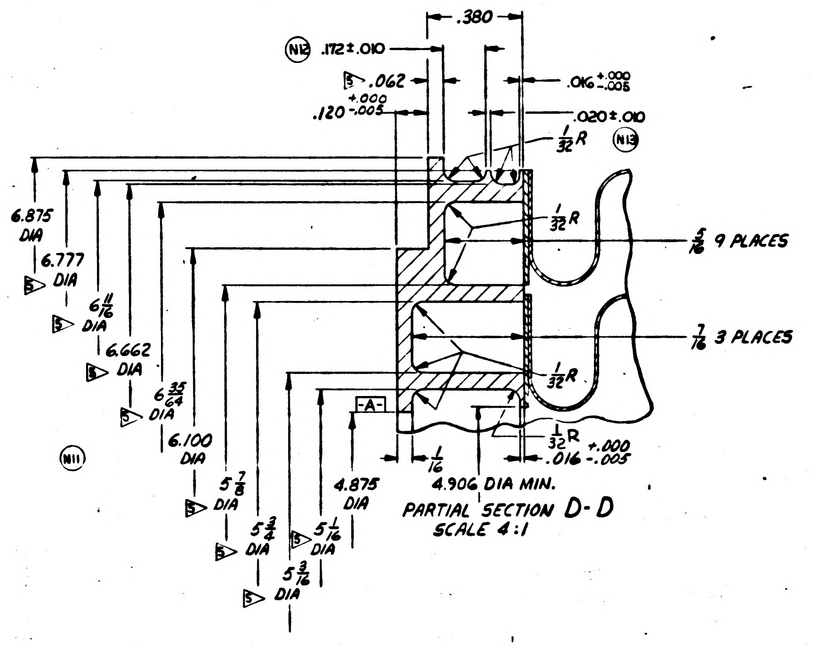
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
H		UPGRADED FOR CLAS[illegible] [illegible]		21 APR [illegible]	J.F.
J6		REVISED IN ACCORDANCE WITH TDRR 01498			
K		REVISED IN A[illegible] [illegible] 2309		[illegible] 63	WK
L		REVISED IN ACCORDANCE WITH TDRR 02514		20 AUG 63	RNG
M		REVISED PER TDRR NO. 03671		21 OCT 63	WK
N13		REVISED PER TDRR NO. 04948		11 DEC. 63	
P2		REVISED PER TDRR NO. 05374		6 JAN 64	WK
R2		REVISED PER TDRR NO. 05725		21 JAN 64	WK
S		REVISED PER TDRR 07594		17 APR 64	JHR


.040 3 PLACES
.040 3 PLACES
.233±.010 3 PLACES
6
5
J6

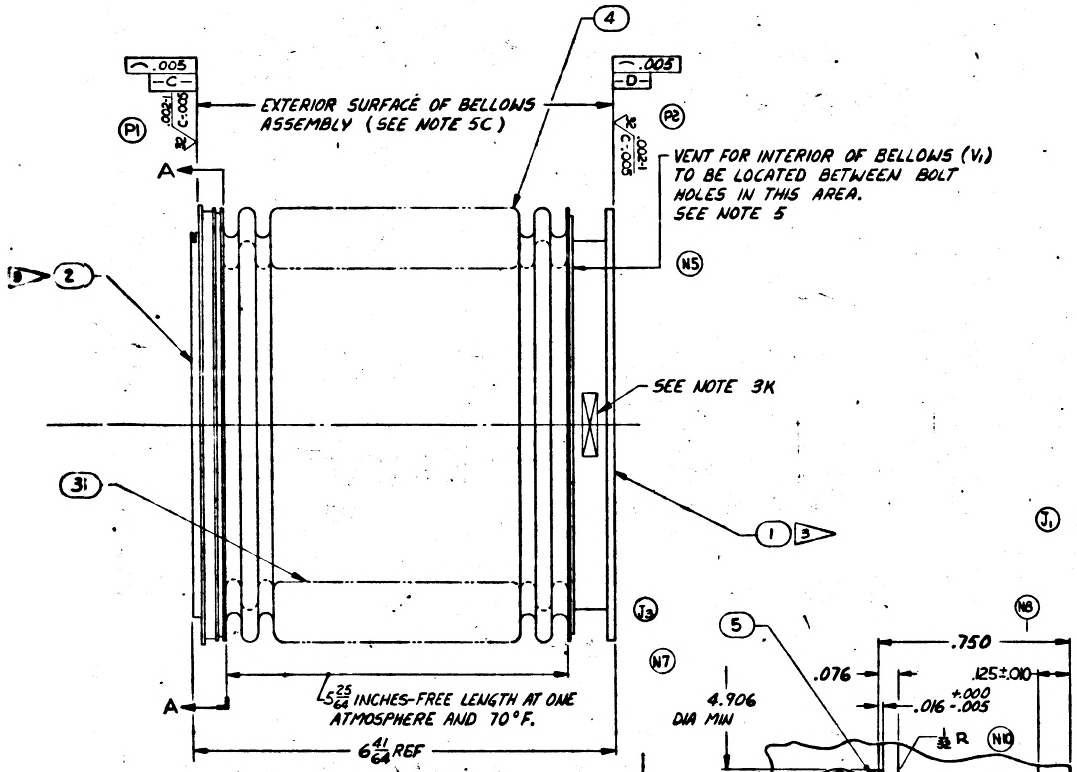
PARTIAL SECTION B-B
SCALE 4:1

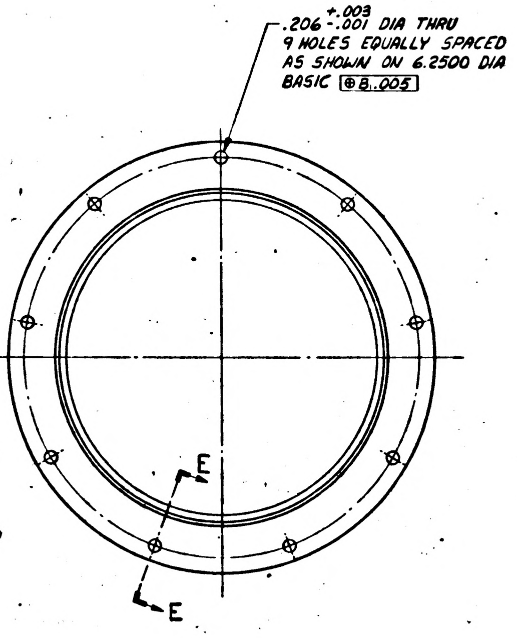

V1
V2
1/32 R
1/32 R
5 5 3/4 DIA
5 9/16 DIA
R2
N3
N4
1/16 5 6 PLACES
5/16 6 PLACES

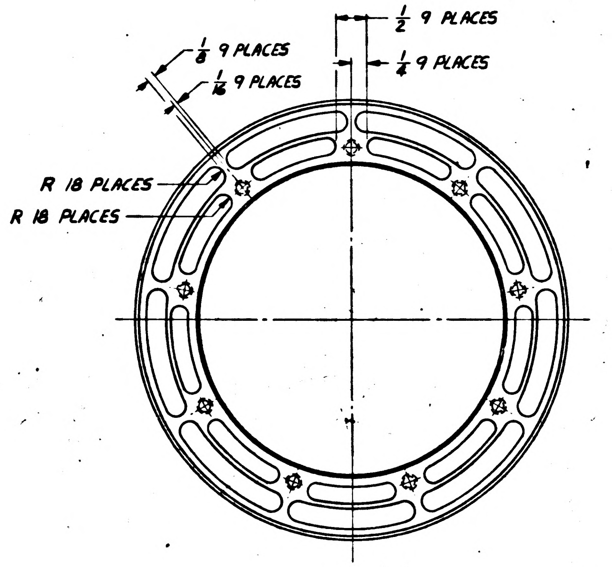
PARTIAL SECTION C-C
SCALE 4:1


.380
N12 .172±.010
5 .062
.120 +.000 -.005
.016 +.000 -.005
.020±.010
1/32 R
N13
1/32 R
5/16 9 PLACES
7/16 3 PLACES
1/32 R
1/32 R
+.000 .016 -.005
1/16
-A-
6.875 DIA
6.777 5 DIA
6 11/16 5 DIA
6.662 5 DIA
6 35/64 5 DIA
6.100 DIA
5 7/8 5 DIA
5 3/4 5 DIA
5 1/16 5 DIA
5 3/16 5 DIA
4.875 DIA
4.906 DIA MIN.
N11

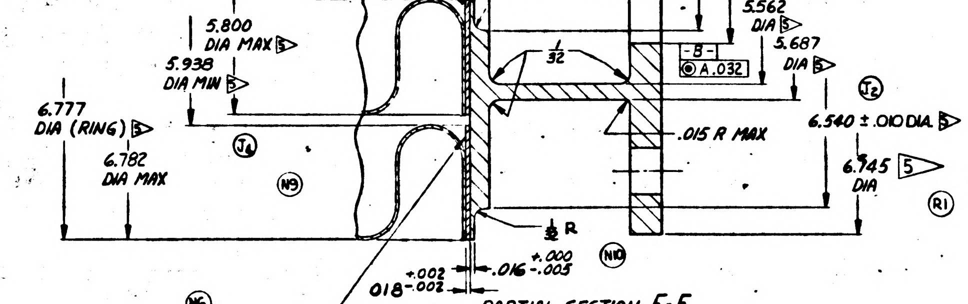
PARTIAL SECTION D-D
SCALE 4:1


.005 -C-
.002-1 C-.005 32
P1
.005 -D-
.002-1 C-.005 32
P2
4
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
N5
A
A
5 2
SEE NOTE 3K
31
1 3
J3
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF


.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕B.005
E
E


1/8 9 PLACES
1/16 9 PLACES
1/2 9 PLACES
1/4 9 PLACES
R 18 PLACES
R 18 PLACES

VIEW A-A


J1 5.156±.010 DIA 5
5.250 DIA
N8
.750
.076
.125±.010
.016 +.000 -.005
4.906 DIA MIN
N7
5
1/32 R
N10
5.562 DIA 5
5.687 DIA 5
-B- ◎A.032
1/32
5.800 DIA MAX 5
5.938 DIA MIN 5
6.777 DIA (RING) 5
6.782 DIA MAX
J4
N9
.015 R MAX
J2
6.540 ±.010 DIA 5
6.745 5 DIA
R1
1/32 R
N10
.016 +.000 -.005
.018 +.002 -.002
N6
6

PARTIAL SECTION E-E
SCALE 4:1

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

[redacted]

[redacted] TDR No. 00103 DATE

2

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 12-62
MIT APPROVAL 21 Nov 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

1899951 S

1899951 R

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763 CL321 STAINLESS STEEL.

2▷ MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:
   (A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
   (B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.
   3▷ (C) INERT HELI-ARC WELD ITEMS (3 4 5 6) TO ITEM (1) AND WELD ITEMS (3 4 5 6) TO ITEM (2) PER MIL-W-8611.
   (D) WELDS TO BE INSPECTED PER MIL-I-6866.

   (E) UNLESS OTHERWISE SPECIFIED:
      1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
      2. SURFACE ROUGHNESS NOT TO EXCEED 125/

   (F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
   (G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156#/IN.

   (J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
   (K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE).*
   (L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)
   (J5) 4▷ (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
   (A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

   SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

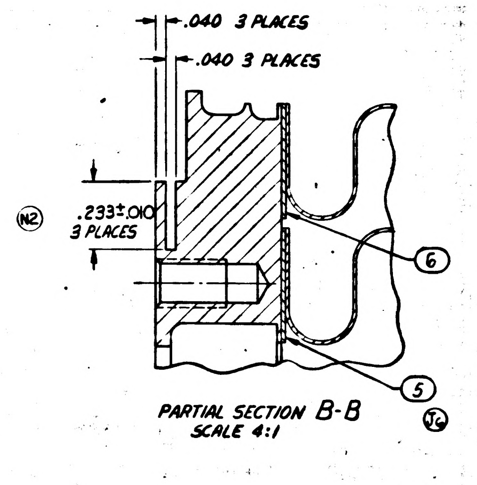
FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

   RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

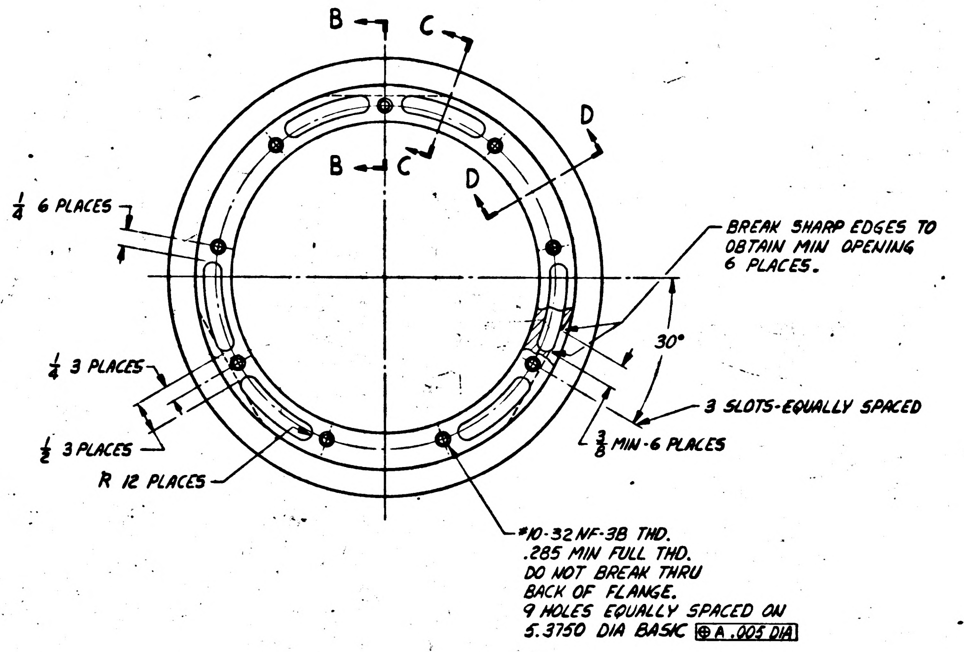
   (B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
   (C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
   (D) TEMPERATURE - +300°F TO -200°F.
   (E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

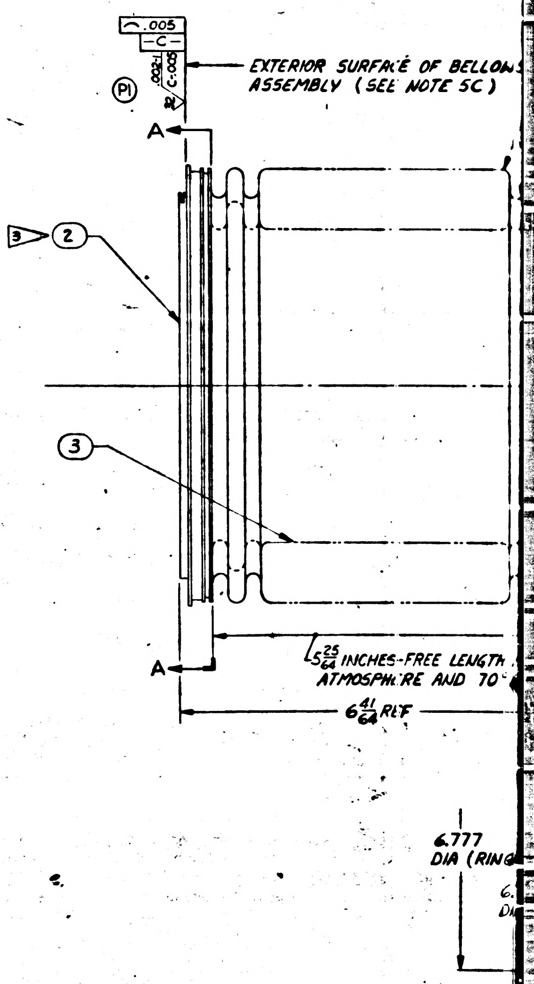
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:
   (A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1; AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.
   (B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
   (C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

(N1) 5▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ± $\frac{1}{32}$ FROM NOMINAL DIMENSION.

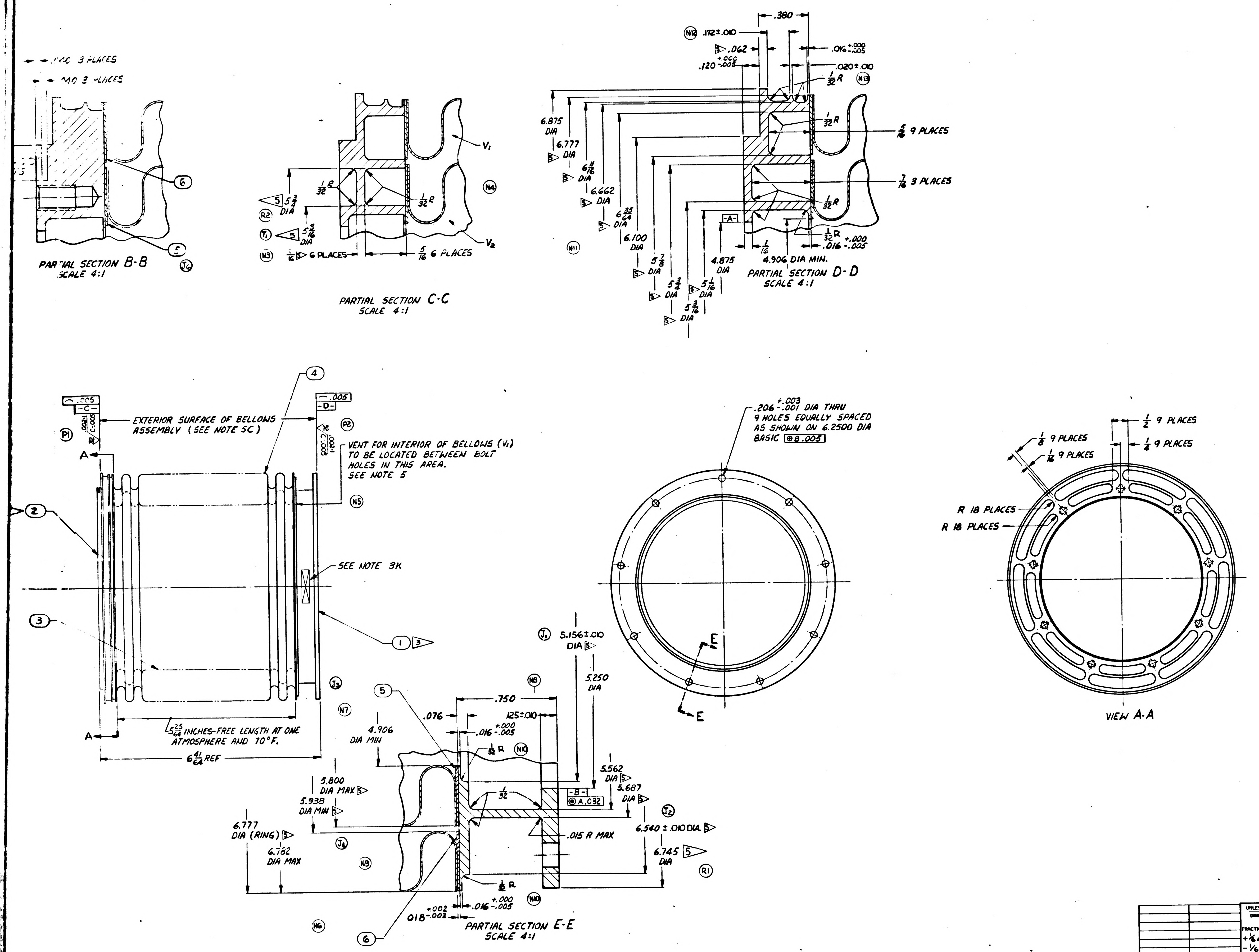

.040 3 PLACES
.040 3 PLACES
(N2)
.233±.010
3 PLACES
6
5

PARTIAL SECTION B-B
SCALE 4:1


B
C
B
C
D
D
$\frac{1}{4}$ 6 PLACES
BREAK SHARP EDGES TO OBTAIN MIN OPENING 6 PLACES.
30°
$\frac{1}{4}$ 3 PLACES
3 SLOTS-EQUALLY SPACED
$\frac{1}{2}$ 3 PLACES
$\frac{3}{8}$ MIN-6 PLACES
R 12 PLACES
#10-32 NF-3B THD.
.285 MIN FULL THD.
DO NOT BREAK THRU
BACK OF FLANGE.
9 HOLES EQUALLY SPACED ON
5.3750 DIA BASIC ⊕ A .005 DIA


.005
-C-
.002:1
C:.005
(P1)
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
A
3▷ 2
3
$5\frac{25}{64}$ INCHES-FREE LENGTH
ATMOSPHERE AND 70°
A
$6\frac{41}{64}$ REF
6.777
DIA (RING

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE		27-APR-63	A.J.F. / WK
J6		REVISED IN ACCORDANCE WITH TDRR 01498			WK
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 July 63	RWG / WK
L		REVISED IN ACCORDANCE WITH TDRR 02514		20 AUG 63	RWG
M		REVISED PER TDRR NO. 03671		21 OCT 63	WK
N13		REVISED PER TDRR NO. 04948		11 DEC. 63	
P2		REVISED PER TDRR NO. 05374		6 JAN 64	WK
R2		REVISED PER TDRR NO. 05725		21 JAN 64	WK
S		REVISED PER TDRR 07594		APR 64	
T		REVISED PER TDRR 08779		15 JUNE 64	RB


.060 3 PLACES
.140 3 PLACES
6
5
J6
5 5 3/4 DIA
R2
T1
5 5 3/16 DIA
N3
1/16 5 6 PLACES
5/16 6 PLACES
1/32 R
1/32 R
V1
V2
N4
N12 .172±.010
.380
5 .062
.016 +.000 -.005
.120 +.000 -.005
.020±.010
1/32 R
N13
6.875 DIA
6.777 5 DIA
6 11/16 5 DIA
6.662 5 DIA
6 35/64 5 DIA
6.100 DIA
5 7/8 5 DIA
5 3/4 5 DIA
5 1/16 5 DIA
5 3/16 5 DIA
4.875 DIA
N11
5/16 9 PLACES
7/16 3 PLACES
1/32 R
1/32 R
-A-
1/16
4.906 DIA MIN.
.016 +.000 -.005
.005 -C-
.002-1 C-.005
P1
A
A
4
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
.005 -D-
.002-1 C-.005
P2
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
N5
2
SEE NOTE 3K
3
1 3
J3
N7
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕B .005
E
E
1/8 9 PLACES
1/16 9 PLACES
1/2 9 PLACES
1/4 9 PLACES
R 18 PLACES
R 18 PLACES
J1 5.156±.010 DIA 5
5.250 DIA
N8
5
.750
.076
.125±.010
.016 +.000 -.005
4.906 DIA MIN
1/32 R
N10
5.800 DIA MAX 5
5.938 DIA MIN 5
6.777 DIA (RING) 5
6.782 DIA MAX
J4
N9
1/32
-B-
◎ A .032
5.562 DIA 5
5.687 DIA 5
J2
.015 R MAX
6.540 ±.010 DIA. 5
6.745 5 DIA
R1
1/32 R
N10
.018 +.002 -.002
.016 +.000 -.005
N6
6

PARTIAL SECTION B-B
SCALE 4:1

PARTIAL SECTION C-C
SCALE 4:1

PARTIAL SECTION D-D
SCALE 4:1

VIEW A-A

PARTIAL SECTION E-E
SCALE 4:1

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

T 1899951

[redacted]

[redacted] TDR No. 00103 DATE

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 1/2/62
MIT APPROVAL 11 Dec 21 Nov 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
SHEET

1899951

2/1899951

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1 QQ-S-763 CL321 STAINLESS STEEL.

2 MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:

(A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED

3 (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611.

(D) WELDS TO BE INSPECTED PER MIL-I-6866.

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
2. SURFACE ROUGHNESS NOT TO EXCEED 125√

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 156#/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE)*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)

(J5) 4 (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

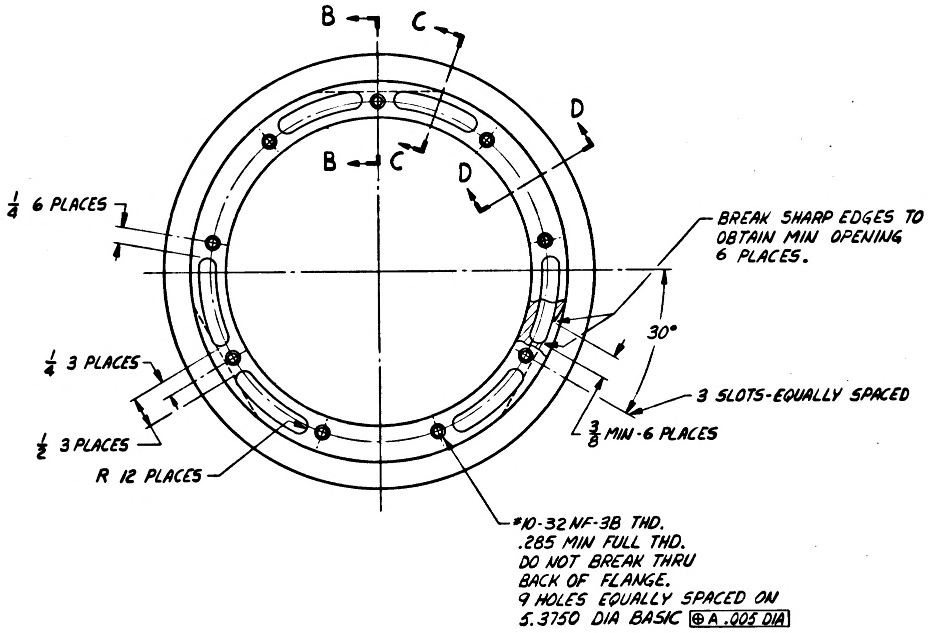
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION:

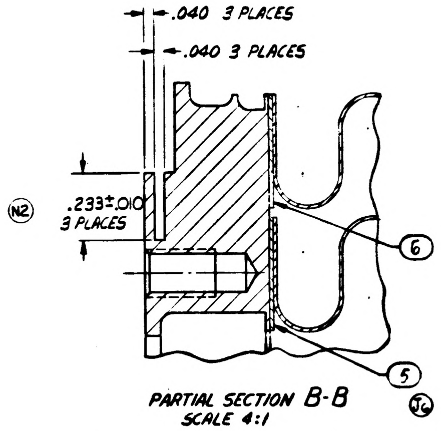
(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.

(B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

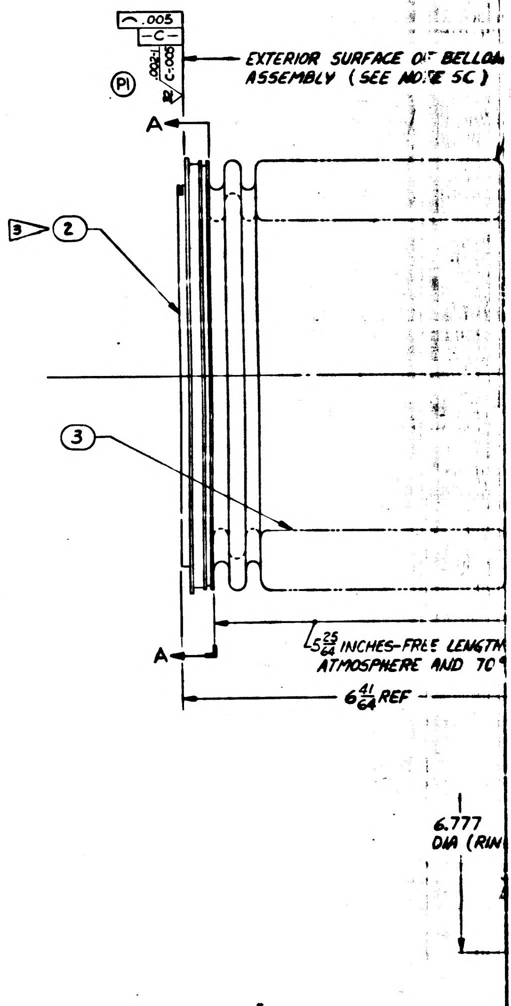
(C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10[illegible] CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUU[illegible] IN V_2 OF 7.5×10^{-4} MM HG.

(N1) 5 THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ± $\frac{1}{32}$ FROM NOMINAL DIMENSION.

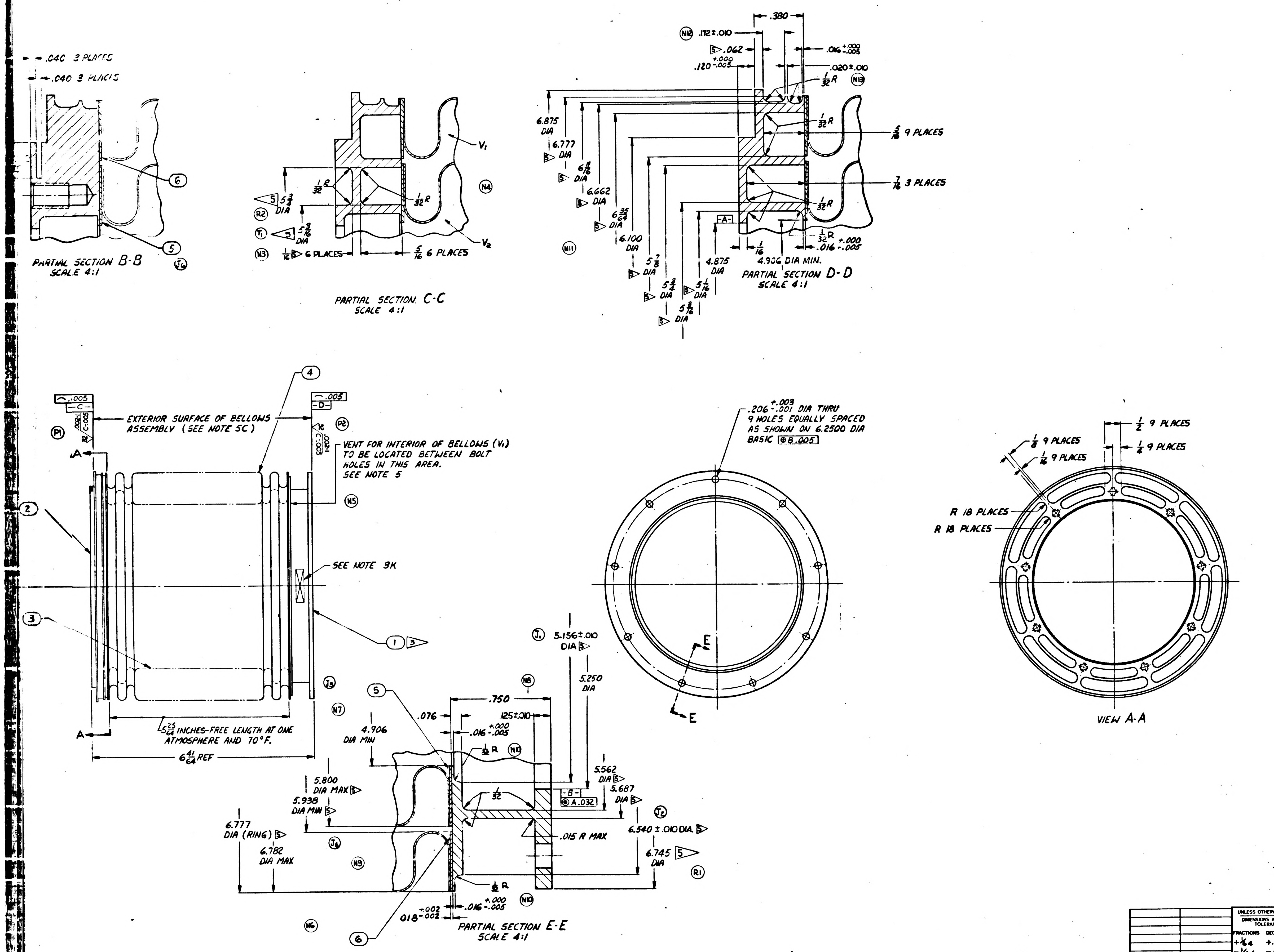

B
C
B
C
D
D
1/4 6 PLACES
1/4 3 PLACES
1/2 3 PLACES
R 12 PLACES
BREAK SHARP EDGES TO OBTAIN MIN OPENING 6 PLACES.
30°
3 SLOTS-EQUALLY SPACED
3/8 MIN-6 PLACES
#10-32 NF-3B THD.
.285 MIN FULL THD.
DO NOT BREAK THRU
BACK OF FLANGE.
9 HOLES EQUALLY SPACED ON
5.3750 DIA BASIC ⊕ A .005 DIA


.040 3 PLACES
.040 3 PLACES
(N2)
.233±.010 3 PLACES
6
5
(J6)

PARTIAL SECTION B-B
SCALE 4:1


⌒ .005
-C-
.002-1 C-.005
(P1)
EXTERIOR SURFACE OF BELLOW
ASSEMBLY (SEE NOTE 5C)
A
3
2
3
A
5 25/64 INCHES-FREE LENGTH
ATMOSPHERE AND 70
6 41/64 REF
6.777
DIA (RIN

1899951


.040 3 PLACES
.040 3 PLACES
6
5
PARTIAL SECTION B-B
SCALE 4:1
5 3/4 DIA
5 9/16 DIA
1/32 R
1/16 6 PLACES
5/16 6 PLACES
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
.380
.112±.010
.062
.120 +.000 -.005
.016 +.000 -.005
.020±.010
1/32 R
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 11/16 DIA
5 9/16 DIA
4.875 DIA
4.906 DIA MIN.
5/16 9 PLACES
7/16 3 PLACES
-A-
PARTIAL SECTION D-D
SCALE 4:1
.005 -C-
.005 -D-
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
SEE NOTE 3K
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
A
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
1/2 9 PLACES
1/8 9 PLACES
1/4 9 PLACES
1/8 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A
5.156±.010 DIA
5.250 DIA
.750
.076
.125±.010
.016 +.000 -.005
4.906 DIA MIN
5.800 DIA MAX
5.938 DIA MIN
6.777 DIA (RING)
6.782 DIA MAX
1/32
-B-
⊙ A .032
5.562 DIA
5.687 DIA
.015 R MAX
6.540±.010 DIA
6.745 DIA
.018 +.002 -.002
PARTIAL SECTION E-E
SCALE 4:1

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
H		UPGRADED FOR CLASS A RELEASE TDRR 01046			
J6		REVISED IN ACCORDANCE WITH TDRR 01498			WH
K		REVISED IN ACCORDANCE WITH TDRR 02308			RWG WH
L		REVISED IN ACCORDANCE WITH TDRR 02514			RWG
M		REVISED PER TDRR NO. 03671		63	WH
N13		REVISED PER TDRR NO. 04948		DEC. 63	
P2		REVISED PER TDRR NO. 05374		6 JAN 64	WH
R2		REVISED PER TDRR NO. 05725		21 JAN 64	WH
S		REVISED PER TDRR 07594		APR 64	
T		REVISED PER TDRR 08773		15 JUNE 64	RB
U		REVISED PER TDRR 10617		6 JUN 64	RW MEM

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER ▷2 ▷4
5	2	1899951-5	RING, ADAPTER, INNER ▷2
4	1	1899951-4	BELLOWS, OUTER ▷2
3	1	1899951-3	BELLOWS, INNER ▷2
2	1	1899951-2	S/C END RINGS ▷1
1	1	1899951-1	OPTICS END RING ▷1

LIST OF PARTS AND MATERIALS

U 1899951 B

[redacted]

[redacted] TDR No. 00103 DATE

1899950-011	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES + - - - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN L. COOPER DATE 12 NOV 62 CHECKED 14 NOV 62 APPROVAL 14 Nov 62 APPROVAL 14 Nov 62	MANNED SPACECRAFT CENTER HOUSTON, TEXAS BELLOWS ASSEMBLY, SCT	
NEXT ASSY	USED ON	MATERIAL SEE NOTE 2	NASA APPROVAL 1/21/62	CODE IDENT NO.	SIZE J 1899951
APPLICATION		CONTRACT NAS 9-497	MIT APPROVAL 21 NOV 62	SCALE 1:1	APPROX 3LB.13OZ SHEET

1899951

2/1899951

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763 CL321 STAINLESS STEEL.

2▷ MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:
   - (A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
   - (B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED
   - 3▷ (C) INERT HELI-ARC WELD ITEMS (3|4|5|6) TO ITEM (1) AND WELD ITEMS (3|4|5|6) TO ITEM (2) PER MIL-W-8611.
   - (D) WELDS TO BE INSPECTED PER MIL-I-6866.
   - (E) UNLESS OTHERWISE SPECIFIED:
     1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005 TO .015 R OR CHAMFER
     2. SURFACE ROUGHNESS NOT TO EXCEED 125√.
   - (F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.
   - (G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE SHALL NOT EXCEED 200 #/IN. IN COMPRESSION AND 160 #/IN. IN TENSION. THE RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 310 #/IN.
   - (J) VENDOR SHIPPING REQUIREMENTS
BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3F ABOVE.
   - (K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE).*
   - (L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3F ABOVE.)
   - (J5) 4▷ (M) *THIS RING IS FOR MFG. PURPOSES ONLY, AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
   - (A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

   - (B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
   - (C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
   - (D) TEMPERATURE - +300°F TO -200°F.
   - (E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

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   - (A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} MM HG EXTERNAL AND IN V_2.
   - (B) EVACUATE V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS MILLION OXYGEN MAX., BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
   - (C) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D", THE MAX EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

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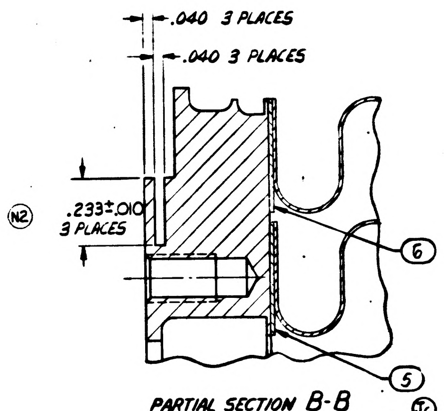
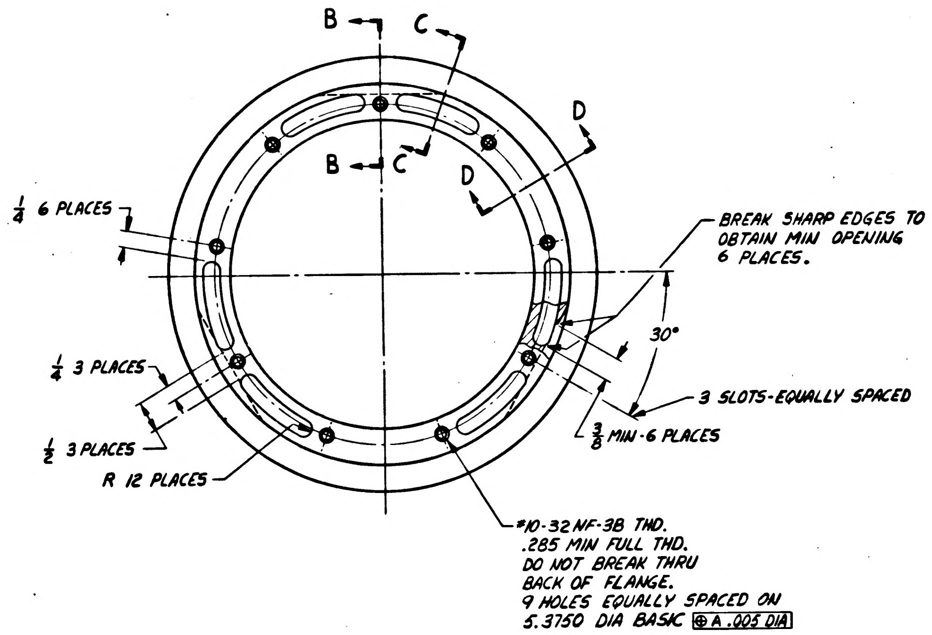
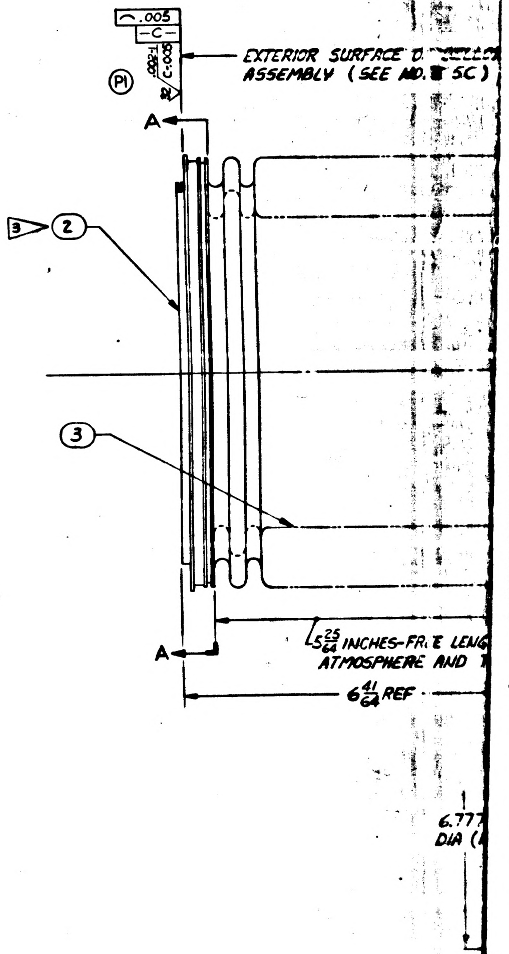
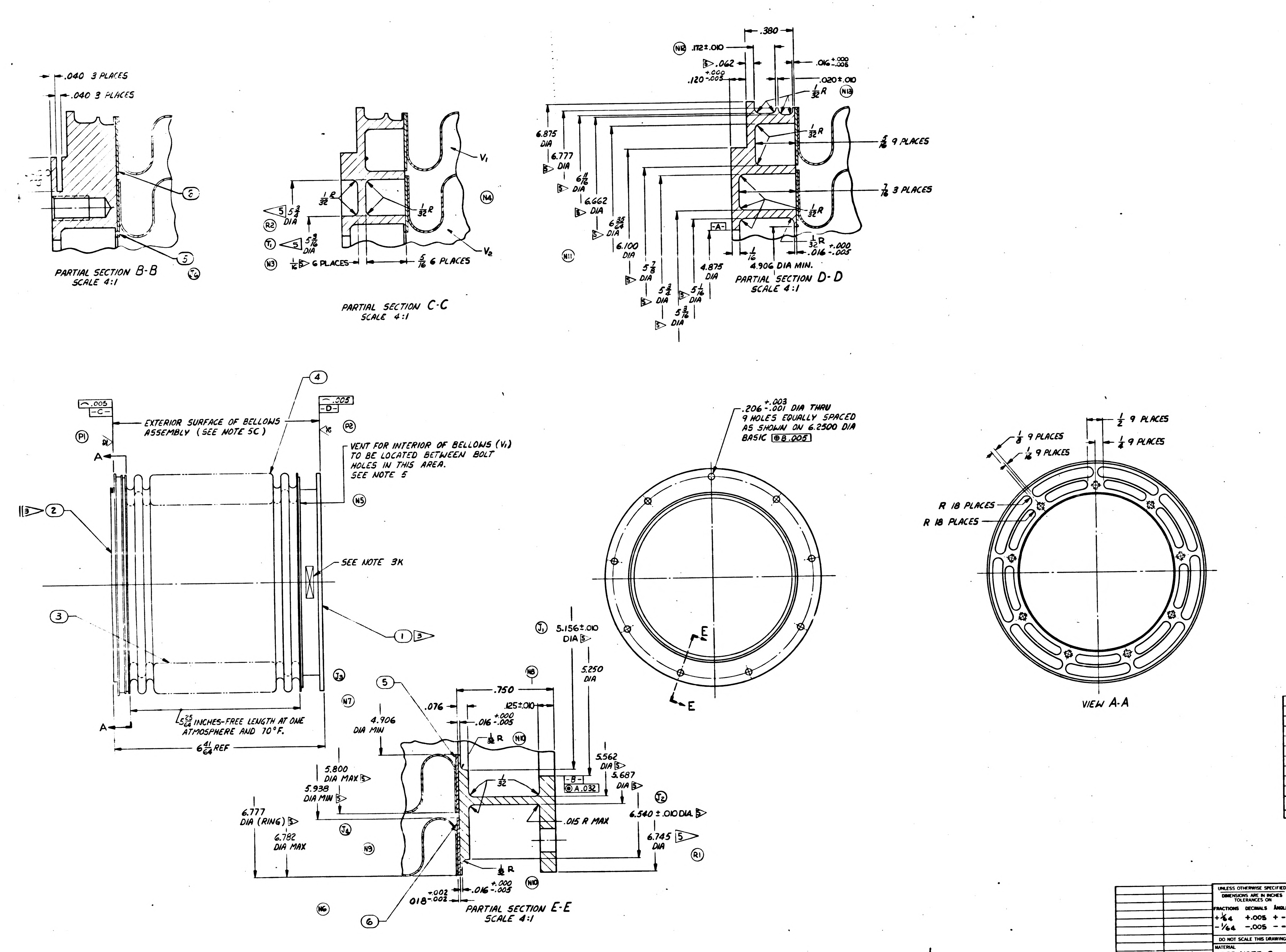


PARTIAL SECTION B-B
SCALE 4:1


B
C
B
C
D
D
1/4 6 PLACES
BREAK SHARP EDGES TO OBTAIN MIN OPENING 6 PLACES.
30°
1/4 3 PLACES
3 SLOTS-EQUALLY SPACED
3/8 MIN-6 PLACES
1/2 3 PLACES
R 12 PLACES
#10-32 NF-3B THD. .285 MIN FULL THD. DO NOT BREAK THRU BACK OF FLANGE. 9 HOLES EQUALLY SPACED ON 5.3750 DIA BASIC ⊕ A .005 DIA



SYM	ZONE	DESCRIPTION	CHG. NO.	DATE	APPD
REVISIONS					
H		UPGRADED FOR CLASS A RELEASE		27 APR	A.J.F.
J6		REVISED IN ACCORDANCE WITH TDRR 01498			
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 July	RWG
L		REVISED IN ACCORDANCE WITH TDRR 02514		20 AUG 63	RWG
M		REVISED PER TDRR NO. 03671		21 OCT 63	
N13		REVISED PER TDRR NO. 04948		11 DEC. 63	
P2		REVISED PER TDRR NO. 05374		6 JAN 64	
R2		REVISED PER TDRR NO. 05725		21 JAN 64	
S		REVISED PER TDRR 07596		APR 64	
T		REVISED PER TDRR 08779		15 JUNE 64	RE
U		REVISED PER TDRR 0617		6 JUN 64	RW
V		REVISED PER TDRR 11627		26 AUG 64	


.040 3 PLACES
.040 3 PLACES
PARTIAL SECTION B-B
SCALE 4:1
V1
V2
N4
R2
T1
N3
5 3/4
5 9/16 DIA
1/32 R
1/16 6 PLACES
5/16 6 PLACES
PARTIAL SECTION C-C
SCALE 4:1
.380
N12 .172±.010
.062
.016 +.000 -.005
.120 +.000 -.005
.020±.010
1/32 R
N13
5/8 9 PLACES
7/16 3 PLACES
6.875 DIA
6.777 DIA
6 11/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 1/16 DIA
5 3/16 DIA
4.875 DIA
-A-
1/16
4.906 DIA MIN.
N11
PARTIAL SECTION D-D
SCALE 4:1
.005 -C-
.005 -D-
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
P1
P2
A
N5
2
3
4
1
SEE NOTE 3K
5 25/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF
J3
N7
.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
1/8 9 PLACES
1/16 9 PLACES
1/2 9 PLACES
1/4 9 PLACES
R 18 PLACES
R 18 PLACES
VIEW A-A
J1 5.156±.010 DIA
5.250 DIA
N8
.750
.076
.125±.010
.016 +.000 -.005
4.906 DIA MIN
1/32 R
N10
5.800 DIA MAX
5.938 DIA MIN
1/32
5.562 DIA
5.687 DIA
-B-
⊚ A .032
J2
6.540±.010 DIA
.015 R MAX
6.745 DIA
R1
6.777 DIA (RING)
6.782 DIA MAX
J4
N9
N6
.018 +.002 -.002
.016 +.000 -.005
PARTIAL SECTION E-E
SCALE 4:1
5
6

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899951-6	RING, ADAPTER, OUTER 2 4
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

V 1899951

[redacted]

[redacted] TDR No. 00103 DATE

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 11/21/62
MIT APPROVAL 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SCT

CODE IDENT NO
SIZE J
1899951
SCALE 1:1
-1302
SHEET

1899951

2718999951

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763 CL321 STAINLESS STEEL.

2▷ MIL-S-6721 CL-321 STAINLESS STEEL.

3. REQUIREMENTS:

(A) PRIOR TO WELDING, PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED

3▷ (C) INERT HELI-ARC WELD ITEMS (3)(4)(5)(6) TO ITEM (1) AND WELD ITEMS (3)(4)(5)(6) TO ITEM (2) PER MIL-W-8611 AS SHOWN OR PER ALTERNATE ASSEMBLY METHOD.

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2. SURFACE ROUGHNESS NOT TO EXCEED 125√.

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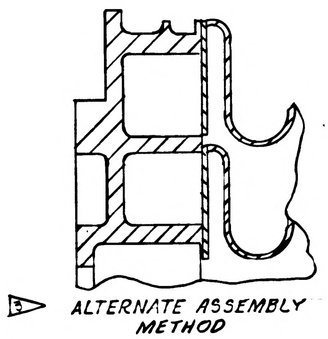
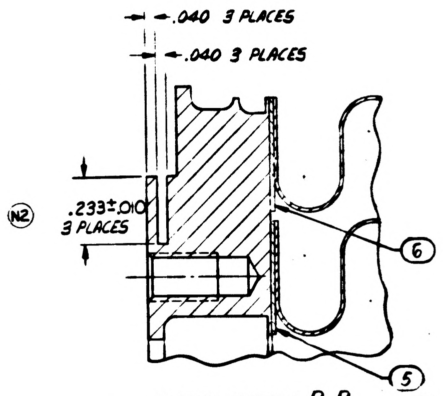
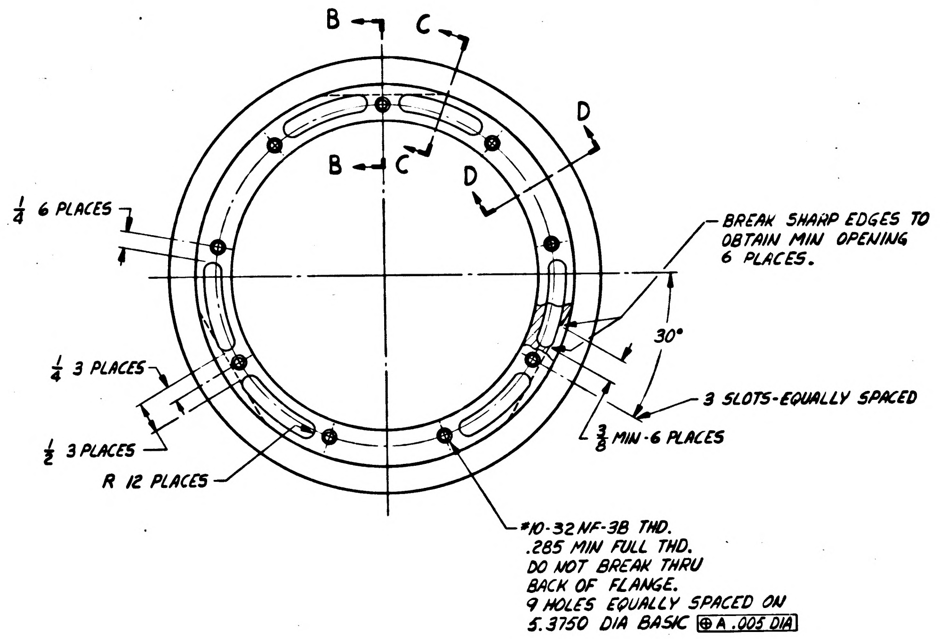


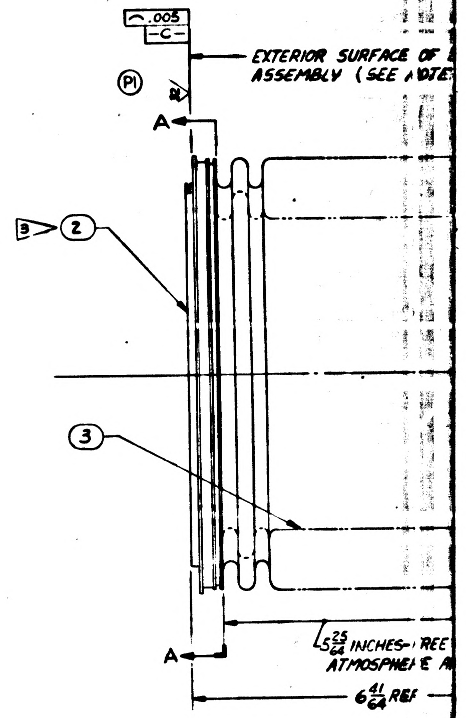
3▷ *ALTERNATE ASSEMBLY METHOD*



PARTIAL SECTION B-B
SCALE 4:1

(JC)





1899951

1/1899951

NOTES:

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2. MATERIAL:

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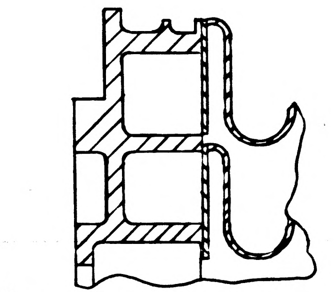

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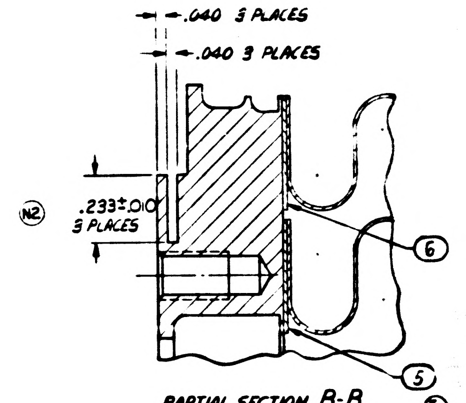
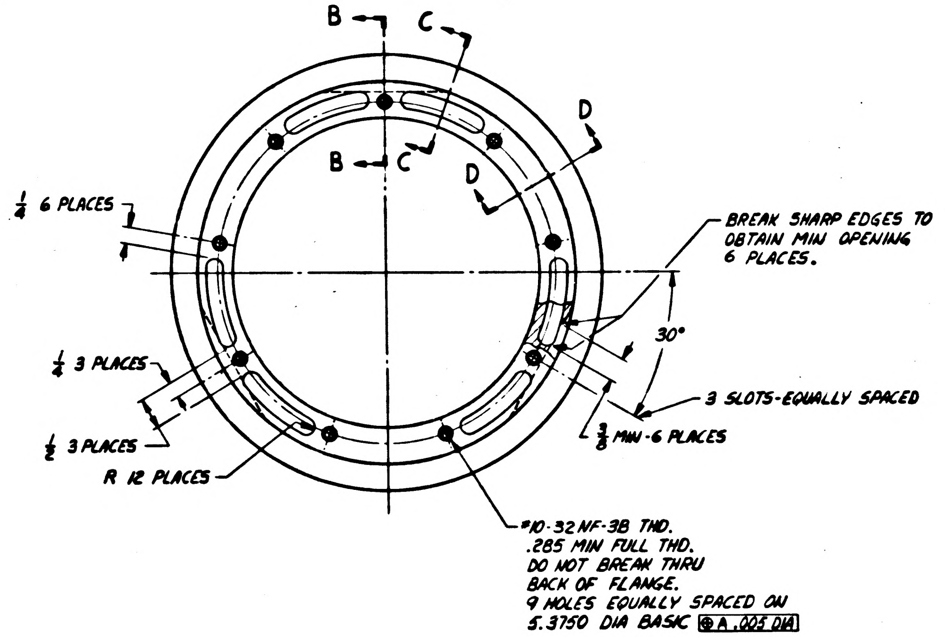
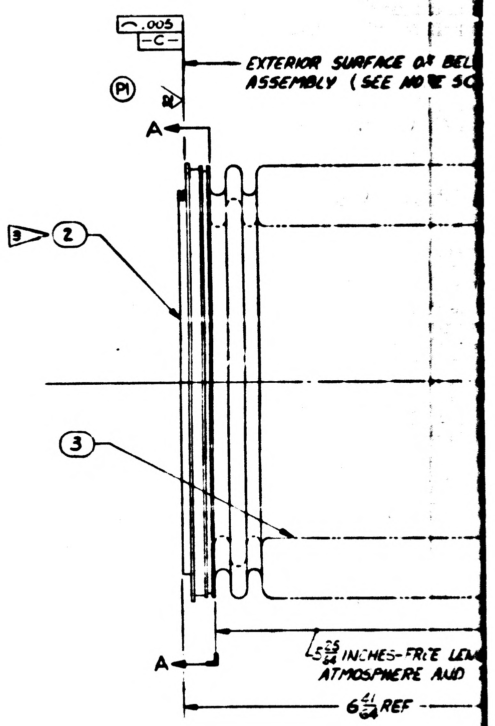


PARTIAL SECTION B-B
SCALE 4:1





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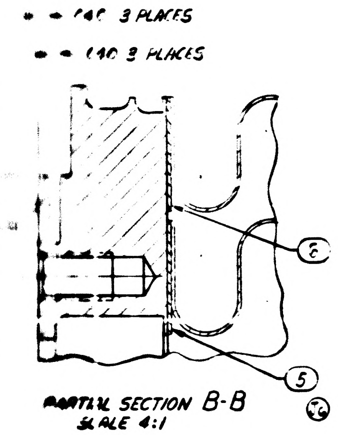
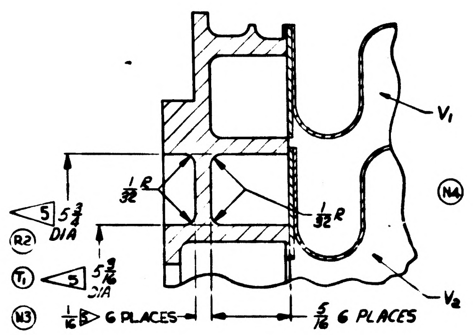
J6		REVISED IN ACCORDANCE WITH TDRR 01498			
K		REVISED IN ACCORDANCE WITH TDRR 02308		31 July 63	RWG WK
L		REVISED IN ACCORDANCE WITH TDRR 02514		20 AUG 63	RWG
M		REVISED PER TDRR NO. 03671		21 OCT 63	WK
N13		REVISED PER TDRR NO. 04948		11 DEC. 63	CH
P2		REVISED PER TDRR NO. 05374		6 JAN 64	WK
R2		REVISED PER TDRR NO. 05725		21 JAN 64	WK
S		REVISED PER TDRR 07594		APR 64	
T		REVISED PER TDRR 08779		15 JUNE 64	RB
U		REVISED PER TDRR 06.7		6 JUN 64	RW
V		REVISED PER TDRR 11627		26 AUG 64	
W		REVISED PER TDRR 29501		15 JUN 66	
Y		REVISED PER TDRR 36722		SEP 68	



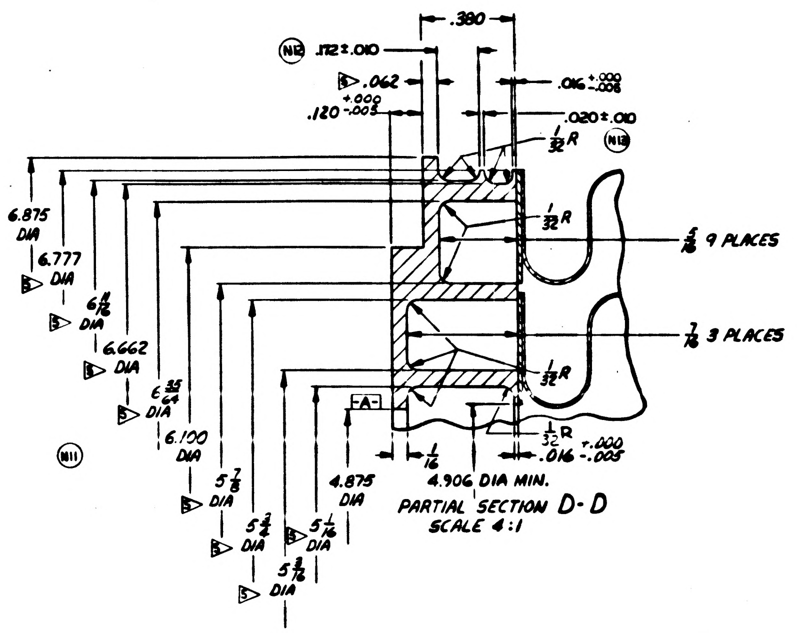
C40 3 PLACES
C40 3 PLACES
3
5

PARTIAL SECTION B-B
SCALE 4:1



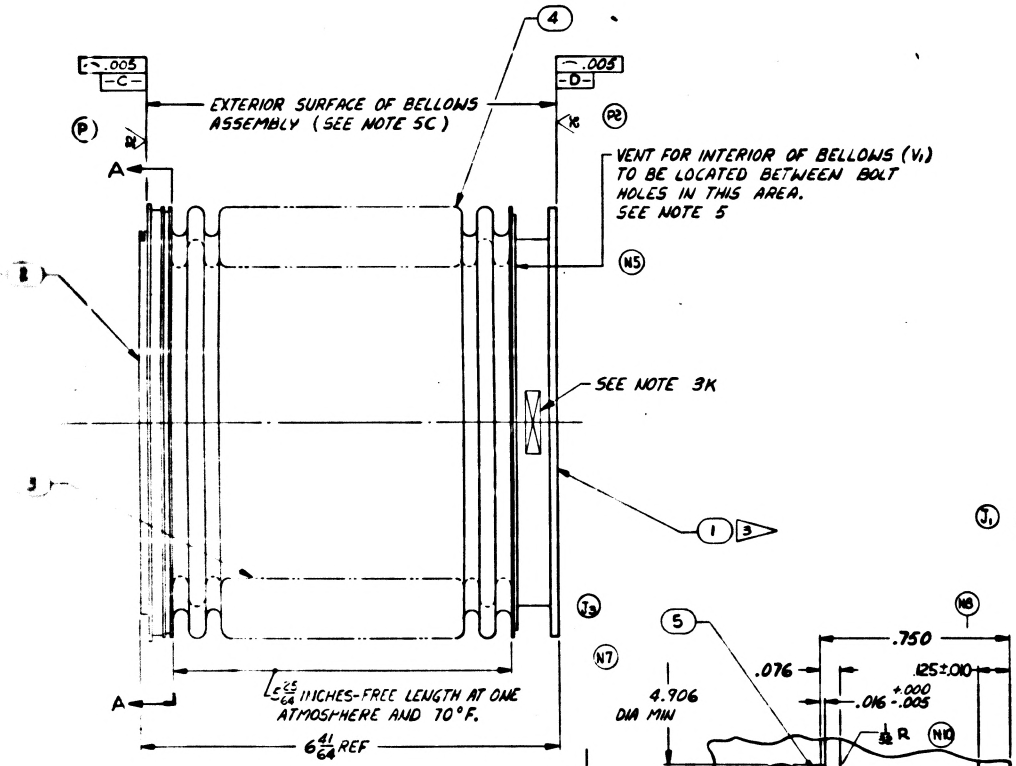
V1
V2
N4
1/32 R
1/32 R
5 5 3/4 DIA
R2
T1
5 5 5/16 DIA
N3
1/16 6 PLACES
5/16 6 PLACES

PARTIAL SECTION C-C
SCALE 4:1

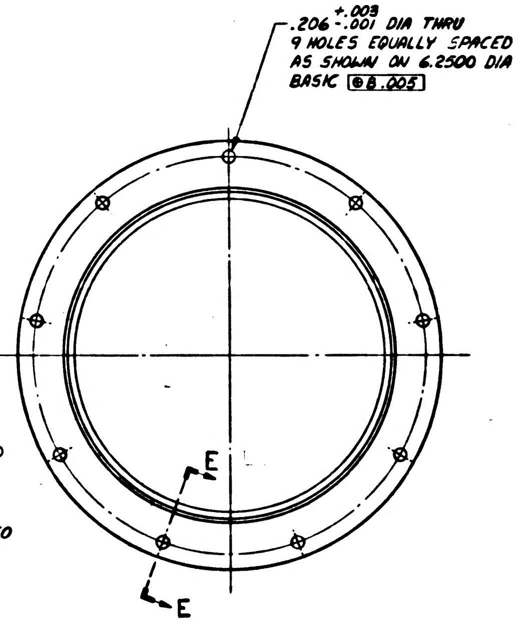


.380
N12 .112±.010
.062
.120 +.000 -.005
.016 +.000 -.005
.020±.010
1/32 R
N12
6.875 DIA
6.777
6 9/16 DIA
6.662 DIA
6 35/64 DIA
6.100 DIA
5 7/8 DIA
5 3/4 DIA
5 5/16 DIA
5 5/8 DIA
4.875 DIA
-A-
N11
5/16 9 PLACES
7/16 3 PLACES
1/32 R
1/32 R
1/16
4.906 DIA MIN.
1/32 R
.016 +.000 -.005

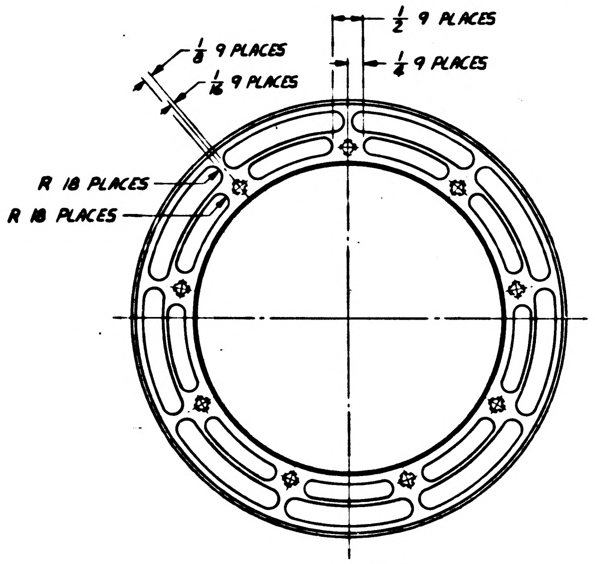
PARTIAL SECTION D-D
SCALE 4:1



.005 -C-
.003 -D-
4
EXTERIOR SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 5C)
P
P2
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5
A
N5
SEE NOTE 3K
1 5
J3
N7
A
6 55/64 INCHES-FREE LENGTH AT ONE ATMOSPHERE AND 70°F.
6 41/64 REF

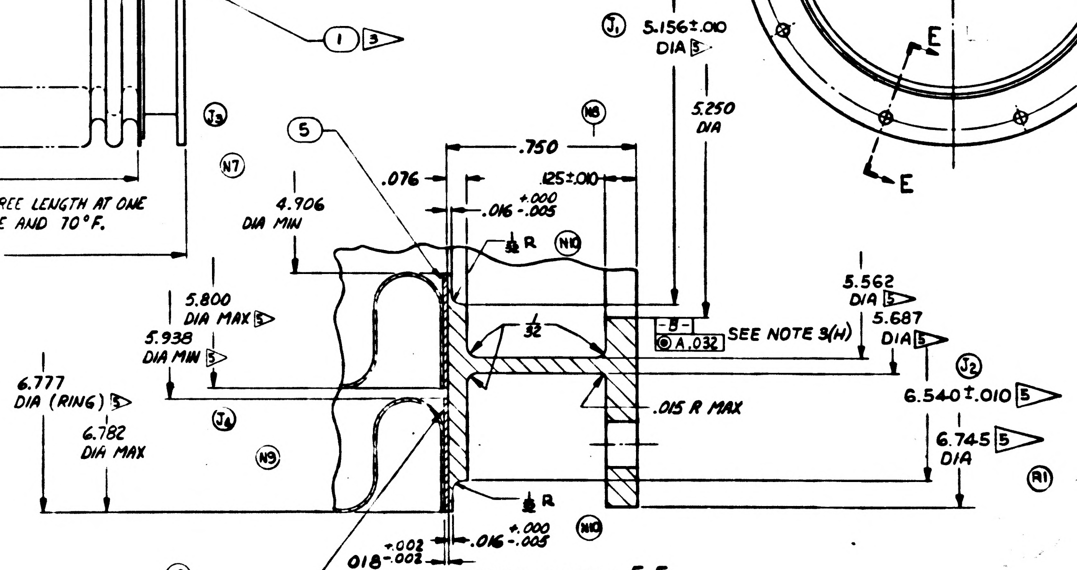


.206 +.003 -.001 DIA THRU 9 HOLES EQUALLY SPACED AS SHOWN ON 6.2500 DIA BASIC ⊕ B .005
E
E



1/2 9 PLACES
1/4 9 PLACES
1/8 9 PLACES
1/16 9 PLACES
R 18 PLACES
R 18 PLACES

VIEW A-A



J1 5.156±.010 DIA 5
5.250 DIA
5
N8
.750
.076
.125±.010
4.906 DIA MIN
.016 +.000 -.005
1/32 R
N10
5.800 DIA MAX 5
5.938 DIA MIN 5
1/32
-B-
⊚ A .032
SEE NOTE 3(H)
5.562 DIA 5
5.687 DIA
J2
6.777 DIA (RING) 5
6.782 DIA MAX
J4
N9
.015 R MAX
6.540±.010 5
6.745 5 DIA
R1
1/32 R
N10
6
N6
.018 +.002 -.002
.016 +.000 -.005

PARTIAL SECTION E-E
SCALE 4:1

6	2	1899951-6	RING, ADAPTER, OUTER 2
5	2	1899951-5	RING, ADAPTER, INNER 2
4	1	1899951-4	BELLOWS, OUTER 2
3	1	1899951-3	BELLOWS, INNER 2
2	1	1899951-2	S/C END RINGS 1
1	1	1899951-1	OPTICS END RING 1
ITEM NO	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

[redacted] ONLY

[redacted] TDR No. 00103 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 NOV 62
APPROVAL 14 NOV 62
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY
SCT

CODE IDENT NO.
SIZE J
1899951
SCALE 1:1
APPROX 3LB.130
SHEET

1899951 Y

1899951 REV Y

2718999951

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

▷1 2. MATERIAL:
- (a) BELLOWS-STAINLESS STEEL PER QQ-S-766, CLASS 347 - MATERIAL THICKNESS AND NUMBER OF CONVOLUTIONS TO BE DETERMINED BY VENDOR.
- ▷2 (b) SUPPORT STRUCTURE-STAINLESS STEEL PER QQ-S-766, CLASS 321.
- ▷3 (c) END RING TO BE ALUMINUM PER QQ-A-327, TEMPER T6

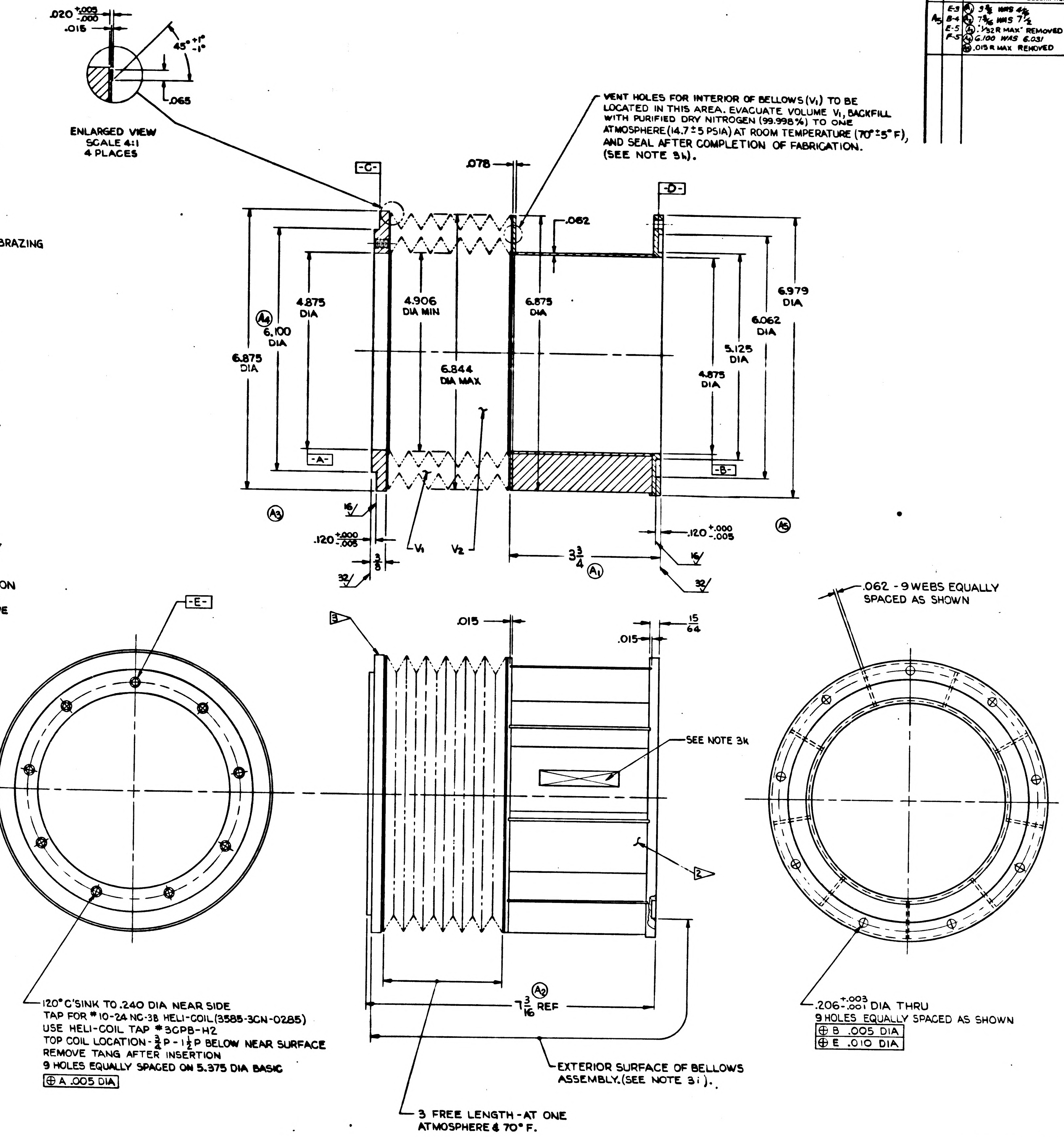
3. REQUIREMENTS:
- (a) PRIOR TO WELDING OR BRAZING, PASSIVATE THE STAINLESS STEEL PORTIONS OF THE BELLOWS ASSEMBLY IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.
- (b) ACID CLEANING SHALL NOT BE PERMITTED AFTER BRAZING AND WELDING.
- (c) END RING TO BE BRAZED TO STAINLESS STEEL BELLOWS ADAPTER RING USING (
- (d) SUPPORT STRUCTURE TO BE FABRICATED BY WELDING (MIL-W-8611) OR BY BRAZING (MIL-B-7883) USING QQ-S-561, CLASS 4 AND O-F-499 FLUX.
- (e) UNLESS OTHERWISE SPECIFIED:
  1. BREAK ALL SHARP EDGES .005-.015 RADIUS OR CHAMFER
  2. SURFACE ROUGHNESS NOT TO EXCEED 125/ AA
- (f) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ OF ITS FREE POSITION. THE END RING AND THE SUPPORT STRUCTURE SHALL BE MAINTAINED PARALLEL DURING THE ABOVE MENTIONED MOVEMENTS.
- (g) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3f ABOVE, THE AXIAL SPRING RATE SHALL NOT EXCEED 100#/IN AND THE RADIAL SPRING RATE SHALL NOT EXCEED 200#/IN.
- (h) PRIOR TO SEALING OF VENT HOLE AND WITH THE BELLOWS ASSEMBLY RESTRAINED, THE MAXIMUM LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC. OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND VACUUM OF 7.5×10^{-10} MM HG IN V_1. MAXIMUM LEAK RATE SHALL NOT EXCEED 15×10^{-8} CC/SEC OF HELIUM AT 90 PSIA IN V_1 AND A VACUUM OF 7.5×10^{-10} MM HG EXTERNAL.
- (i) WITH THE BELLOWS SEALED AT SURFACES "C" AND "D" THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-10} MM HG.
- (j) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3f ABOVE.
- (k) IDENTIFY USING DRAWING NUMBERS, REVISION LETTER, SERIAL NUMBER AND MANUFACTURERS SYMBOL AT THE INDICATED LOCATION PER MIL-STD-130 (NAMEPLATE PERMISSIBLE).
- (l) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE)

4. THE BELLOWS ASSEMBLY SHALL MEET ALL THE ABOVE REQUIREMENTS BEFORE AND AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:
- (a) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY SUPPORT STRUCTURE SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE $\pm\frac{1}{4}$ INCH ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

  SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH, DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

  RANDOM VIBRATION-SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.
- (b) SHOCK-75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE THREE NORMAL AXES.
- (c) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
- (d) TEMPERATURE - +300°F TO -200°F.
- (e) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).
- (f) SALT SPRAY - 20% SALT SPRAY SOLUTION FOR 50 HOURS MIN. (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).



VENT HOLES FOR INTERIOR OF BELLOWS (V_1) TO BE LOCATED IN THIS AREA. EVACUATE VOLUME V_1, BACKFILL WITH PURIFIED DRY NITROGEN (99.998%) TO ONE ATMOSPHERE (14.7 ± 5 PSIA) AT ROOM TEMPERATURE (70° ± 5° F), AND SEAL AFTER COMPLETION OF FABRICATION. (SEE NOTE 3h).

120° C'SINK TO .240 DIA NEAR SIDE
TAP FOR #10-24 NC-3B HELI-COIL (3585-3CN-0285)
USE HELI-COIL TAP #3CPB-H2
TOP COIL LOCATION - $\frac{3}{4}$P - $1\frac{1}{2}$P BELOW NEAR SURFACE
REMOVE TANG AFTER INSERTION
9 HOLES EQUALLY SPACED ON 5.375 DIA BASIC
⊕ A .005 DIA

3 FREE LENGTH - AT ONE ATMOSPHERE & 70° F.

EXTERIOR SURFACE OF BELLOWS ASSEMBLY. (SEE NOTE 3i).

.206 +.003 -.001 DIA THRU
9 HOLES EQUALLY SPACED AS SHOWN
⊕ B .005 DIA
⊕ E .010 DIA

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A5	E-3 B-4 E-5 F-5	A1 $3\frac{3}{4}$ WAS $4\frac{1}{16}$ A2 $7\frac{3}{16}$ WAS $7\frac{1}{2}$ A3 ".1/32 R MAX" REMOVED A4 6.100 WAS 6.031 A5 .015 R MAX REMOVED	D.C. 51205	20 NOV 62	WEM

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. [illegible] DATE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+ -
-1/64	-.005	- -

DO NOT SCALE THIS DRAWING
MATERIAL ▷1
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL
MIT APPROVAL

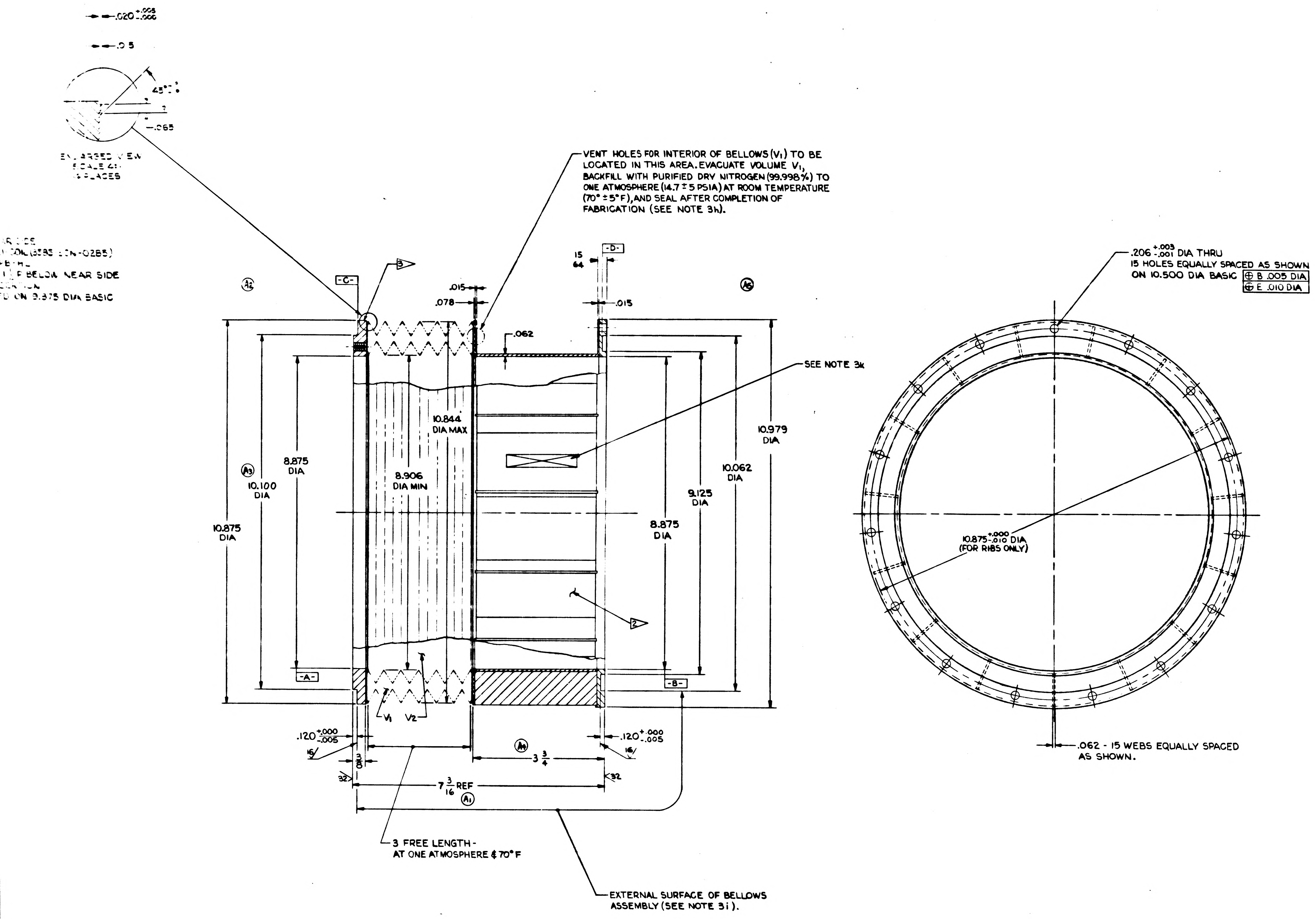
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY-
SCT

CODE IDENT NO
SIZE E
1899951
SCALE 1:1
SHEET

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A5	8F 7C 6D	A1 7 3/16 REF WAS 7 1/2 REF A2 1/32 R MAX REMOVED A3 10.100 DIA WAS 10.031 DIA A4 3 3/4 WAS 4 1/16 A5 .015 R MAX REMOVED	DO 51205	20 NOV 62	FK


.020 +.005 -.000
.05
45°
.065
ENLARGED VIEW
SCALE 4:1
PLACES
C
B
A2
A5
-C-
-D-
15/64
.015
.078
.015
.062
VENT HOLES FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED IN THIS AREA. EVACUATE VOLUME V1, BACKFILL WITH PURIFIED DRY NITROGEN (99.998%) TO ONE ATMOSPHERE (14.7 ± 5 PSIA) AT ROOM TEMPERATURE (70° ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION (SEE NOTE 3h).
SEE NOTE 3k
10.844 DIA MAX
8.906 DIA MIN
A3
10.100 DIA
8.875 DIA
10.875 DIA
10.979 DIA
10.062 DIA
9.125 DIA
8.875 DIA
2
-A-
-B-
V1
V2
.120 +.000 -.005
.120 +.000 -.005
16
32
3/8
A4
3 3/4
7 3/16 REF
A1
3 FREE LENGTH - AT ONE ATMOSPHERE & 70°F
EXTERNAL SURFACE OF BELLOWS ASSEMBLY (SEE NOTE 3i).
.206 +.003 -.001 DIA THRU
15 HOLES EQUALLY SPACED AS SHOWN ON 10.500 DIA BASIC
⊕ B .005 DIA
⊕ E .010 DIA
10.875 +.000 -.010 DIA (FOR RIBS ONLY)
.062 - 15 WEBS EQUALLY SPACED AS SHOWN.
BELOW NEAR SIDE
ON 9.875 DIA BASIC

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

FOR INFORMATION ONLY

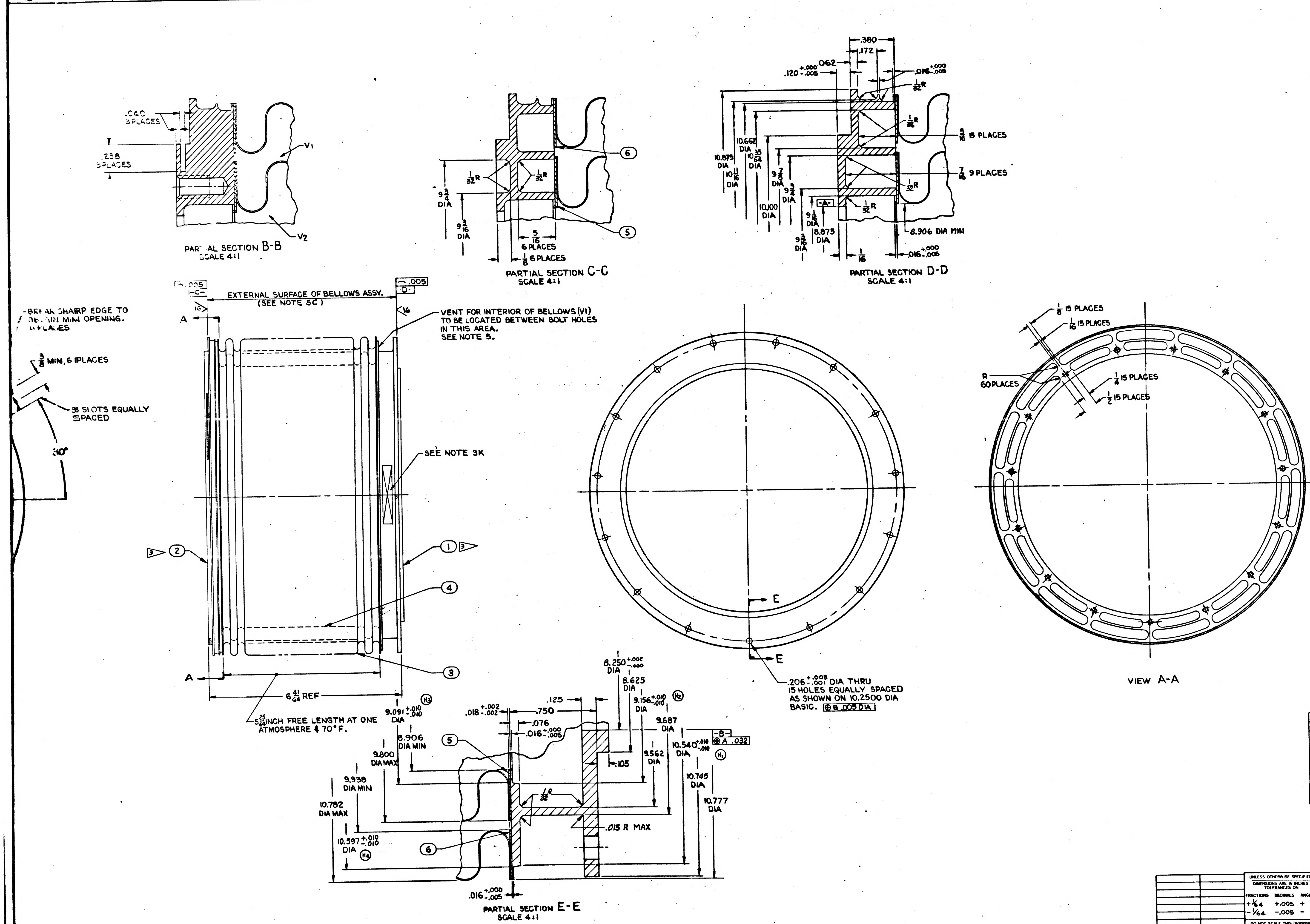
CLASS B RELEASE TDR No. ___ DATE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES + -	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	ACSP PN DRAWN COOPER DATE 14 NOV 62 CHECKED 14 NOV 62 APPROVAL 14 Nov 62 APPROVAL 14 Nov 62	BELLOWS ASSEMBLY - SXT
MATERIAL 1	NASA APPROVAL	CODE IDENT NO SIZE J 1899952
CONTRACT	MIT APPROVAL NOV	SCALE 1:1 SHEET

1899952

2/51

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR CLASS A RELEASE		APR 63	
H5		REVISED IN ACCORDANCE WITH TDRR 0499			
J		REVISED IN ACCORDANCE WITH TDRR 0255		26 AUG 63	RWG
K		REVISED PER TDRR NO 0367		2 OCT 63	



.040 3 PLACES
.238 3 PLACES
V1
V2
PARTIAL SECTION B-B
SCALE 4:1
⑥
⑤
1/32 R
9 3/4 DIA
9 3/16 DIA
5/16 6 PLACES
1/8 6 PLACES
PARTIAL SECTION C-C
SCALE 4:1
.380
.172
.062
.120 +.000 -.005
.016 +.000 -.005
1/32 R
5/16 15 PLACES
7/16 9 PLACES
10.875 DIA
10.662 DIA
10 35/64 DIA
10 11/16 DIA
9 7/8 DIA
9 3/4 DIA
10.100 DIA
9 1/2 DIA
8.875 DIA
9 3/16 DIA
-A-
8.906 DIA MIN
1/16
PARTIAL SECTION D-D
SCALE 4:1
.005 -C-
.005 -D-
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
16
BREAK SHARP EDGE TO OBTAIN MIN OPENING. 6 PLACES
3/8 MIN, 6 PLACES
38 SLOTS EQUALLY SPACED
30°
A
VENT FOR INTERIOR OF BELLOWS (VI) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
2
1
4
3
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70° F.
E
.206 +.003 -.001 DIA THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC. ⊕ B .005 DIA
1/8 15 PLACES
1/16 15 PLACES
R 60 PLACES
1/4 15 PLACES
1/2 15 PLACES
VIEW A-A
8.250 +.002 -.000 DIA
8.625 DIA
.125
.750
.018 +.002 -.002
.076
.016 +.000 -.005
9.091 +.010 -.010 DIA
H3
9.156 +.010 -.010 DIA
H2
9.687 DIA
8.906 DIA MIN
9.800 DIA MAX
.105
9.562 DIA
10.540 +.010 -.010 DIA
-B-
⊚ A .032
H1
9.938 DIA MIN
1/32 R
10.745 DIA
10.777 DIA
10.782 DIA MAX
10.597 +.010 -.010 DIA
H4
.015 R MAX
.016 +.000 -.005
PARTIAL SECTION E-E
SCALE 4:1

6	2	1899952-6	RING, ADAPTER OUTER	2 4
5	2	1899952-5	RING, ADAPTER INNER	2
4	1	1899952-4	BELLOWS, INNER	2
3	1	1899952-3	BELLOWS, OUTER	2
2	1	1899952-2	S C END RING	1
1	1	1899952-1	OPTICS END RING	1
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
LIST OF PARTS AND MATERIALS				

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00104 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+
-1/64	-.005	-

DO NOT SCALE THIS DRAWING
MATERIAL 1 2
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 14 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 1/2/63
MIT APPROVAL 21 Nov 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SXT

CODE IDENT NO
SIZE J
1899952
SCALE 1:1
SHEET

1899952 K

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:
1 QQ-S-763, CL 321 STAINLESS STEEL
2 MIL-S-6721, CL 321 STAINLESS STEEL

3. REQUIREMENTS:

(A) PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

3 (C) INERT HELI-ARC WELD ITEMS (3)(4)(5)(6) TO ITEM (1) AND WELD ITEMS (3)(4)(5)(6) TO ITEM (2) PER MIL-W-8611

(D) WELDING TO BE INSPECTED PER MIL-I-6866

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005-.015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS NOT TO EXCEED 125

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 244 #/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3 ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE)*.

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE.)

(HS) 4 *(M) THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE $\pm\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

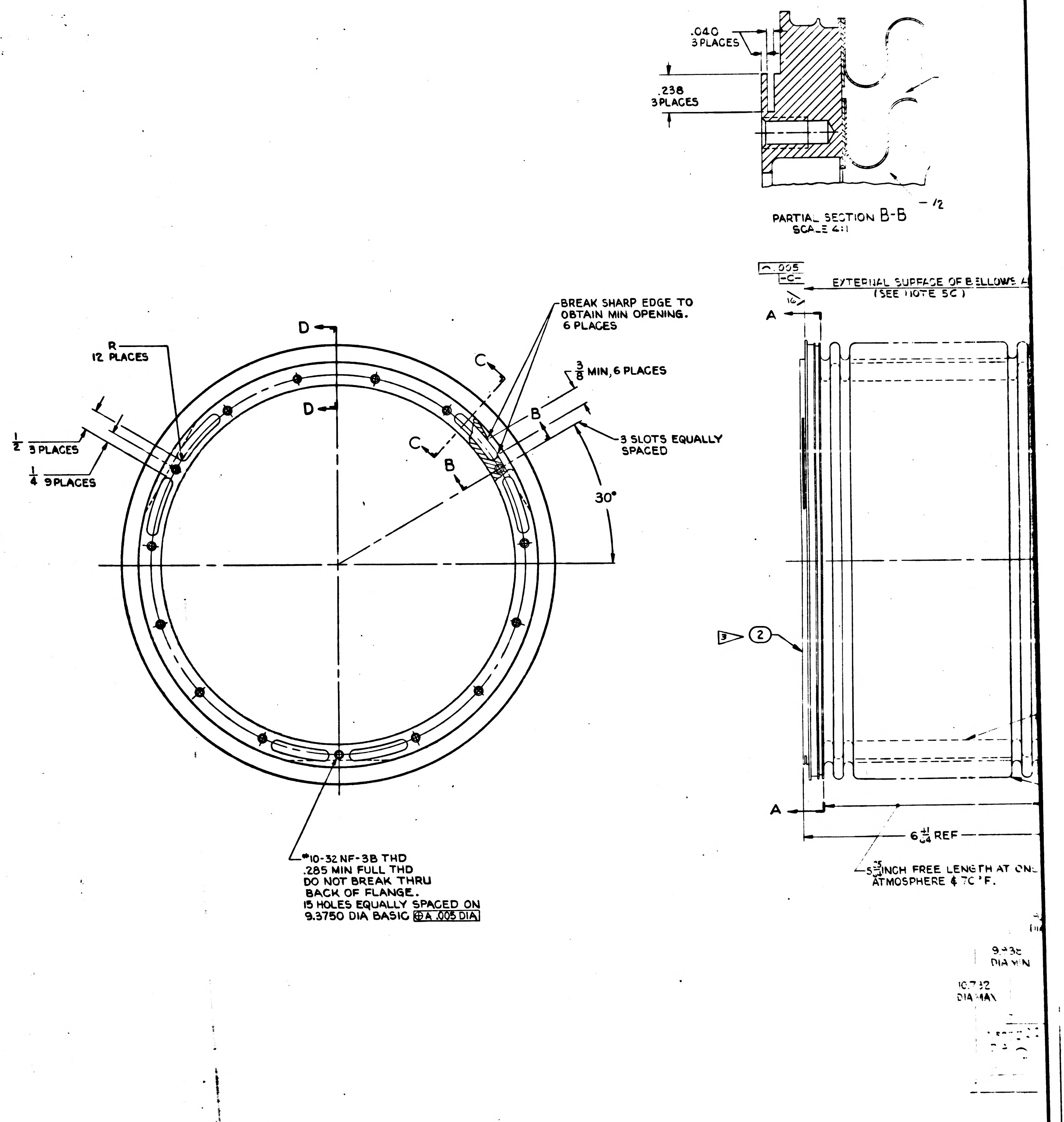
(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
(D) TEMPERATURE - +300°F TO -200°F.
(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

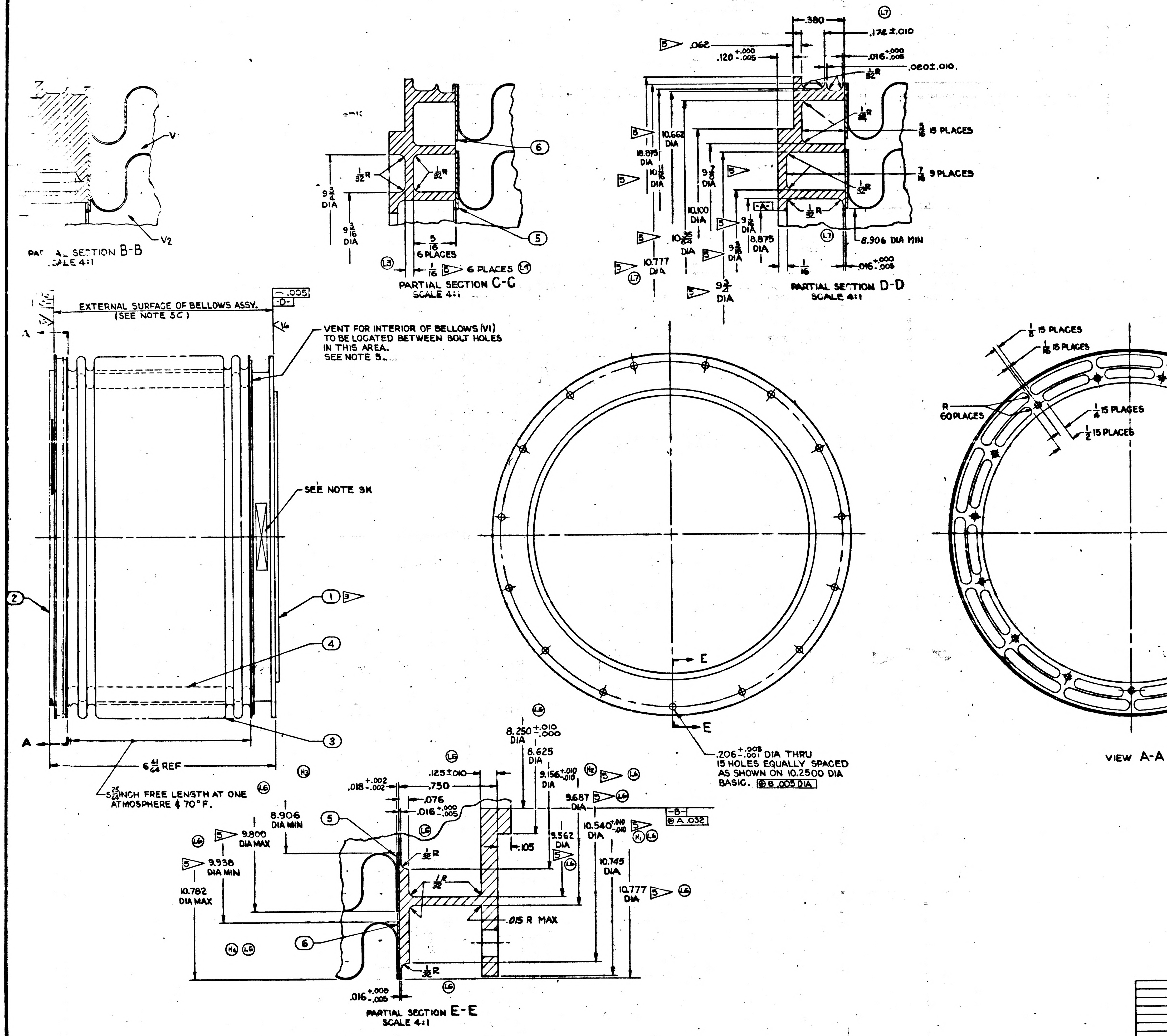
(B) EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

(C) WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.


.040
3 PLACES
.238
3 PLACES
PARTIAL SECTION B-B
SCALE 4:1
R
12 PLACES
$\frac{1}{2}$ 3 PLACES
$\frac{1}{4}$ 9 PLACES
D
C
B
BREAK SHARP EDGE TO OBTAIN MIN OPENING. 6 PLACES
$\frac{3}{8}$ MIN, 6 PLACES
3 SLOTS EQUALLY SPACED
30°
#10-32 NF-3B THD .285 MIN FULL THD DO NOT BREAK THRU BACK OF FLANGE. 15 HOLES EQUALLY SPACED ON 9.3750 DIA BASIC ⊕ A .005 DIA
.005
-C-
EXTERNAL SURFACE OF BELLOWS A
(SEE NOTE 5C)
A
3
2
$6\frac{+1}{64}$ REF
$5\frac{25}{64}$ INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
9.938 DIA MIN
10.732 DIA MAX

1899952

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
REVISIONS					
G		UPGRADED FOR CLASS A RELEASE TDRR 01047		27 APR 63	
H5		REVISED IN ACCORDANCE WITH TDRR 01499			
J		REVISED IN ACCORDANCE WITH TDRR 02515		20 AUG 63	RWS
K		REVISED PER TDRR NO. 03671		21 OCT 63	
L7		REVISED PER TDRR NO. 04949		11 DEC 63	



PARTIAL SECTION B-B
SCALE 4:1
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
6
5
1/32 R
1/32 R
9 3/4 DIA
9 9/16 DIA
5/16
6 PLACES
1/16
6 PLACES
L3
L4
PARTIAL SECTION D-D
SCALE 4:1
.380
.172 ± .010
.062
.120 +.000 -.005
.016 +.000 -.005
.020 ± .010
1/32 R
1/64 R
5/8 15 PLACES
7/16 9 PLACES
1/32 R
1/32 R
-A-
8.906 DIA MIN
.016 +.000 -.005
1/16
10.875 DIA
10.662 DIA
10 11/16
9 7/8 DIA
10.100 DIA
10 35/64 DIA
9 1/8 DIA
9 3/4 DIA
8.875 DIA
10.777 DIA
9 3/4 DIA
L7
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
.005
-D-
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
A
A
2
1
3
4
3
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
L6
E
E
.206 +.003 -.001 DIA THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC. ⊕ B .005 DIA
1/8 15 PLACES
1/16 15 PLACES
R 60 PLACES
1/4 15 PLACES
1/2 15 PLACES
VIEW A-A
PARTIAL SECTION E-E
SCALE 4:1
8.250 +.010 -.000 DIA
8.625 DIA
9.156 +.010 -.010 DIA
9.687 DIA
.125 ± .010
.750
.076
.018 +.002 -.002
.016 +.000 -.005
8.906 DIA MIN
9.800 DIA MAX
9.938 DIA MIN
10.782 DIA MAX
9.562 DIA
10.540 +.010 -.010 DIA
-B-
⊕ A .038
10.745 DIA
10.777 DIA
.105
1/32 R
1/32 R
1/32 R
.015 R MAX
.016 +.000 -.005
5
6
H2
H5
H3
L6

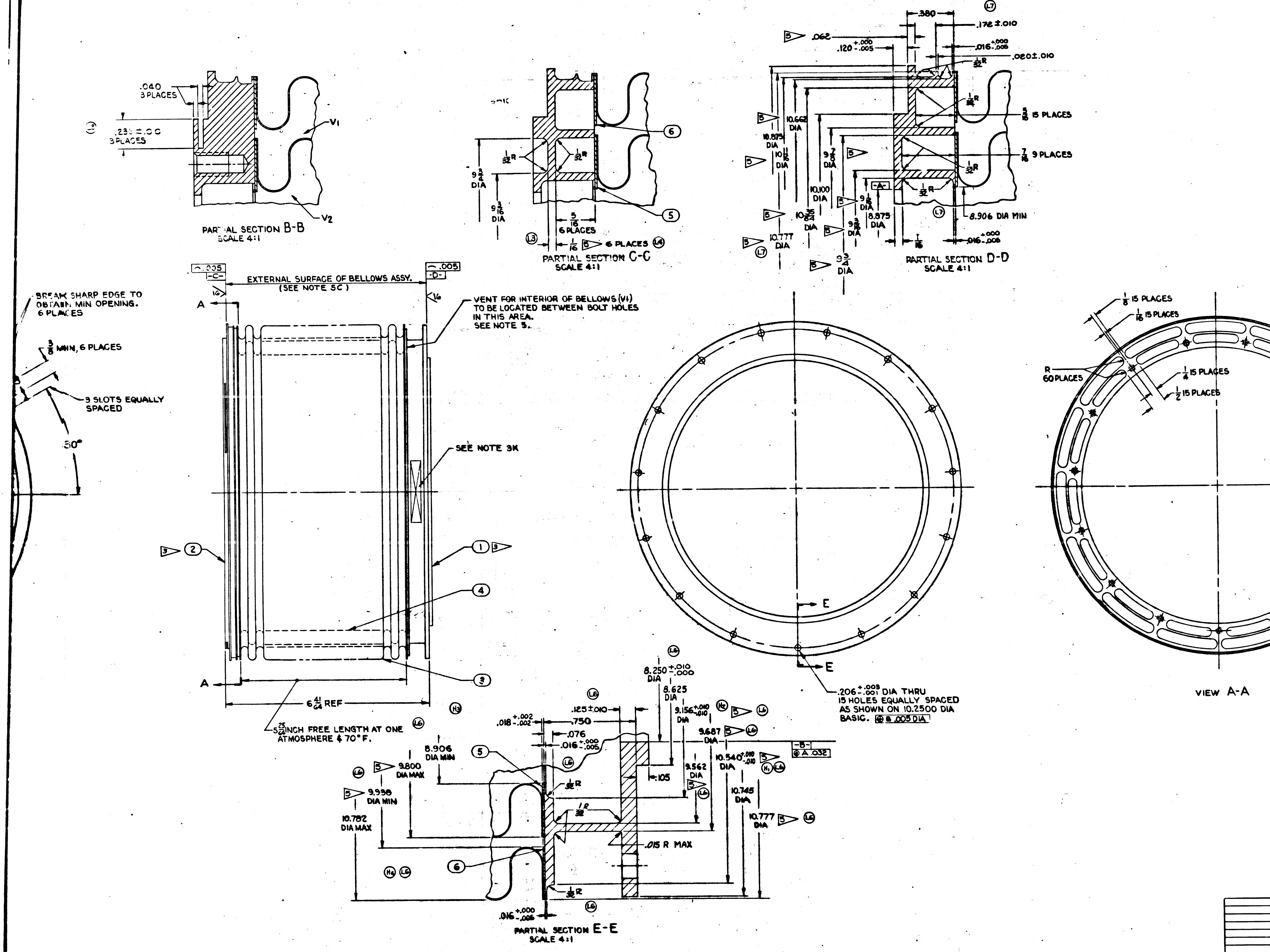
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899952-6	RING, ADAPTER OUTER 2 4
5	2	1899952-5	RING, ADAPTER INNER 2
4	1	1899952-4	BELLOWS, INNER 2
3	1	1899952-3	BELLOWS, OUTER 2
2	1	1899952-2	S/C END RING
1	1	1899952-1	OPTICS END RING

LIST OF PARTS AND MATERIALS

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00104 DATE

1899950-011 NEXT ASSY	1899950-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES + - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN L. COOPER DATE 14 NOV 62 CHECKED 14 NOV 62 APPROVAL 14 Nov 62 APPROVAL 14 Nov 62	MANNED SPACECRAFT CENTER HOUSTON, TEXAS BELLOWS ASSEMBLY, SXT
APPLICATION		MATERIAL 1 2 CONTRACT NAS-9-497	NASA APPROVAL 11/21/62 R. Bass MIT APPROVAL 21 Nov 62	CODE IDENT NO. SIZE J 1899952 SCALE 1:1 SHEET



.040
3 PLACES
.235 ±.005
3 PLACES
V1
V2
PARTIAL SECTION B-B
SCALE 4:1
6
5
$\frac{1}{32}$R
$9\frac{3}{4}$ DIA
$9\frac{3}{16}$ DIA
$\frac{5}{16}$
6 PLACES
$\frac{1}{16}$
6 PLACES
L3
L4
PARTIAL SECTION C-C
SCALE 4:1
L7
.380
.178 ±.010
.062
.120 +.000 −.005
.016 +.000 −.005
.020 ±.010
10.662 DIA
10.875 DIA
$10\frac{11}{16}$ DIA
$9\frac{7}{8}$ DIA
10.100 DIA
$10\frac{35}{64}$ DIA
$9\frac{1}{2}$ DIA
$9\frac{3}{16}$ DIA
8.875 DIA
10.777 DIA
$9\frac{3}{4}$ DIA
-A-
$\frac{5}{16}$ 15 PLACES
$\frac{7}{16}$ 9 PLACES
8.906 DIA MIN
$\frac{1}{16}$
.016 +.000 −.005
PARTIAL SECTION D-D
SCALE 4:1
BREAK SHARP EDGE TO OBTAIN MIN OPENING. 6 PLACES
$\frac{3}{8}$ MIN, 6 PLACES
9 SLOTS EQUALLY SPACED
30°
.005 -C-
.005 -D-
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
A
A
1
2
3
4
$6\frac{41}{64}$ REF
$5\frac{25}{64}$ INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
L6
H3
E
E
.206 +.003 −.001 DIA THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC. ⊕ B .005 DIA
$\frac{1}{8}$ 15 PLACES
$\frac{1}{16}$ 15 PLACES
R 60 PLACES
$\frac{1}{4}$ 15 PLACES
$\frac{1}{2}$ 15 PLACES
VIEW A-A
8.250 +.010 −.000 DIA
8.625 DIA
.125 ±.010
.750
.018 +.002 −.002
.076
.016 +.000 −.005
9.156 +.010 −.010 DIA
9.687 DIA
8.906 DIA MIN
9.800 DIA MAX
9.998 DIA MIN
10.782 DIA MAX
.105
9.562 DIA
10.540 +.010 −.010 DIA
10.745 DIA
10.777 DIA
-B-
⊕ A .032
$\frac{1}{32}$R
$\frac{1}{32}$R
.015 R MAX
.016 +.000 −.005
H2
H4
PARTIAL SECTION E-E
SCALE 4:1

REVISIONS				
SYM	ZONE	DESCRIPTION	CHG NO.	DATE
G		UPGRADED FOR CLASS A RELEASE		APR 63
H5		REVISED IN ACCORDANCE WITH TDRR 0499		
J		REVISED IN ACCORDANCE WITH TDRR 0255		20 AUG 63
K		REVISED PER TDRR NO 0367		21 OCT 63
L		REVISED PER TDRR NO 04924		11 DEC 63

6	2	1899952-6	RING, ADAPTER OUTER
5	2	1899952-5	RING, ADAPTER INNER
4	1	1899952-4	BELLOWS, INNER
3	1	1899952-3	BELLOWS, OUTER
2	1	1899952-2	S/C END RING
1	1	1899952-1	OPT CS END RING
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

~~FOR INFORMATION ONL~~

CLASS ~~B RELEASE~~ TDR No. OC104 DA

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 −1/64
DECIMALS +.005 −.005
ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL 1 2
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 14 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 4/2/62
MIT APPROVAL W. Kupfer 21 Nov 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SXT

CODE IDENT NO
SIZE J
1899952
SCALE 1:1
SHEET

1899952 L

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763, CL321 STAINLESS STEEL

2▷ MIL-S-6721, CL321 STAINLESS STEEL

3. REQUIREMENTS:
(A) PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

3▷ (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611

(D) WELDING TO BE INSPECTED PER MIL-I-6866

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005-.015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS NOT TO EXCEED 125√

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 244 #/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3 ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE).*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE.)

(H5) 4▷ (M) *THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

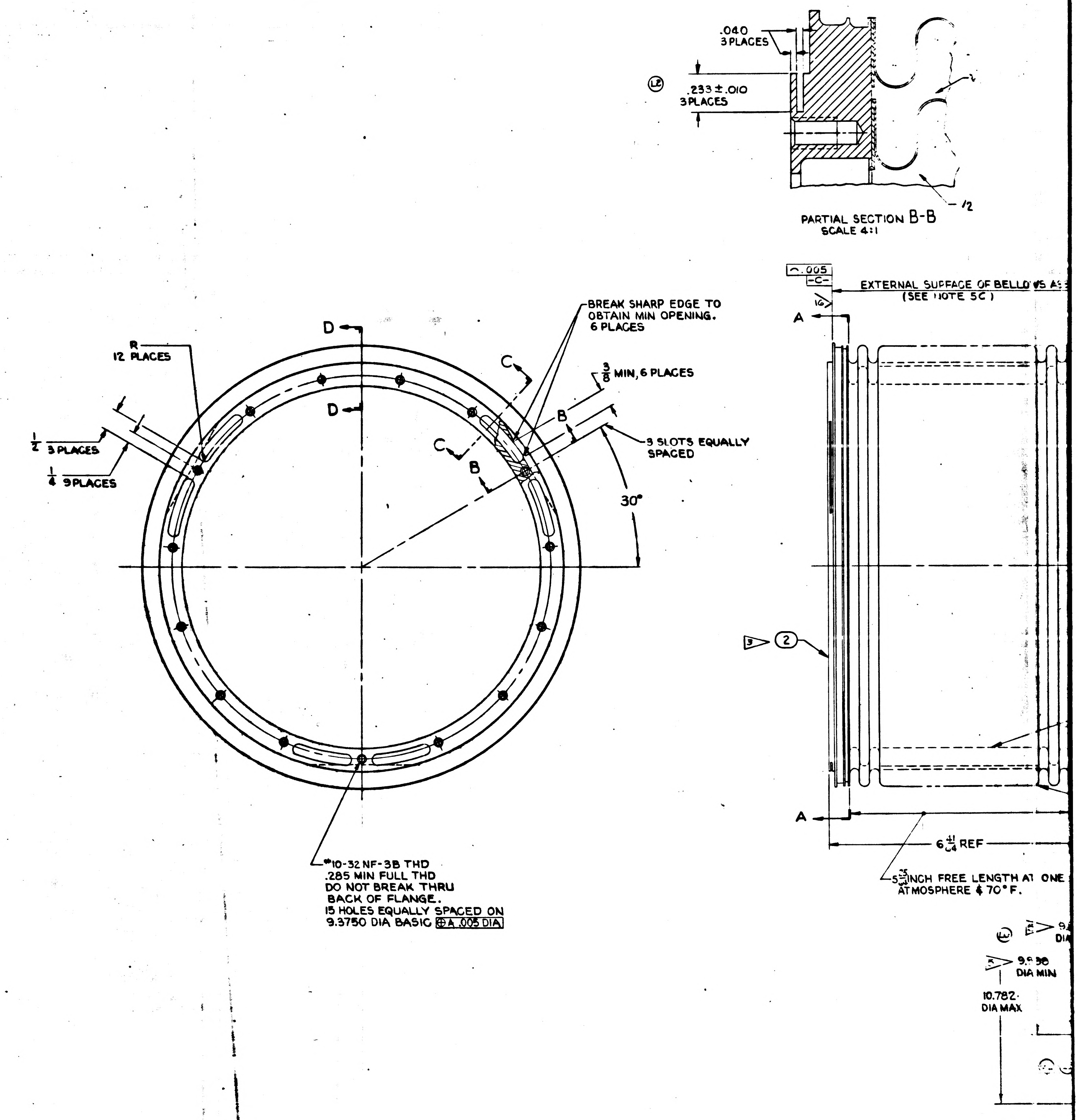
RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.
(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.
(D) TEMPERATURE - +300°F TO -200°F.
(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.
(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

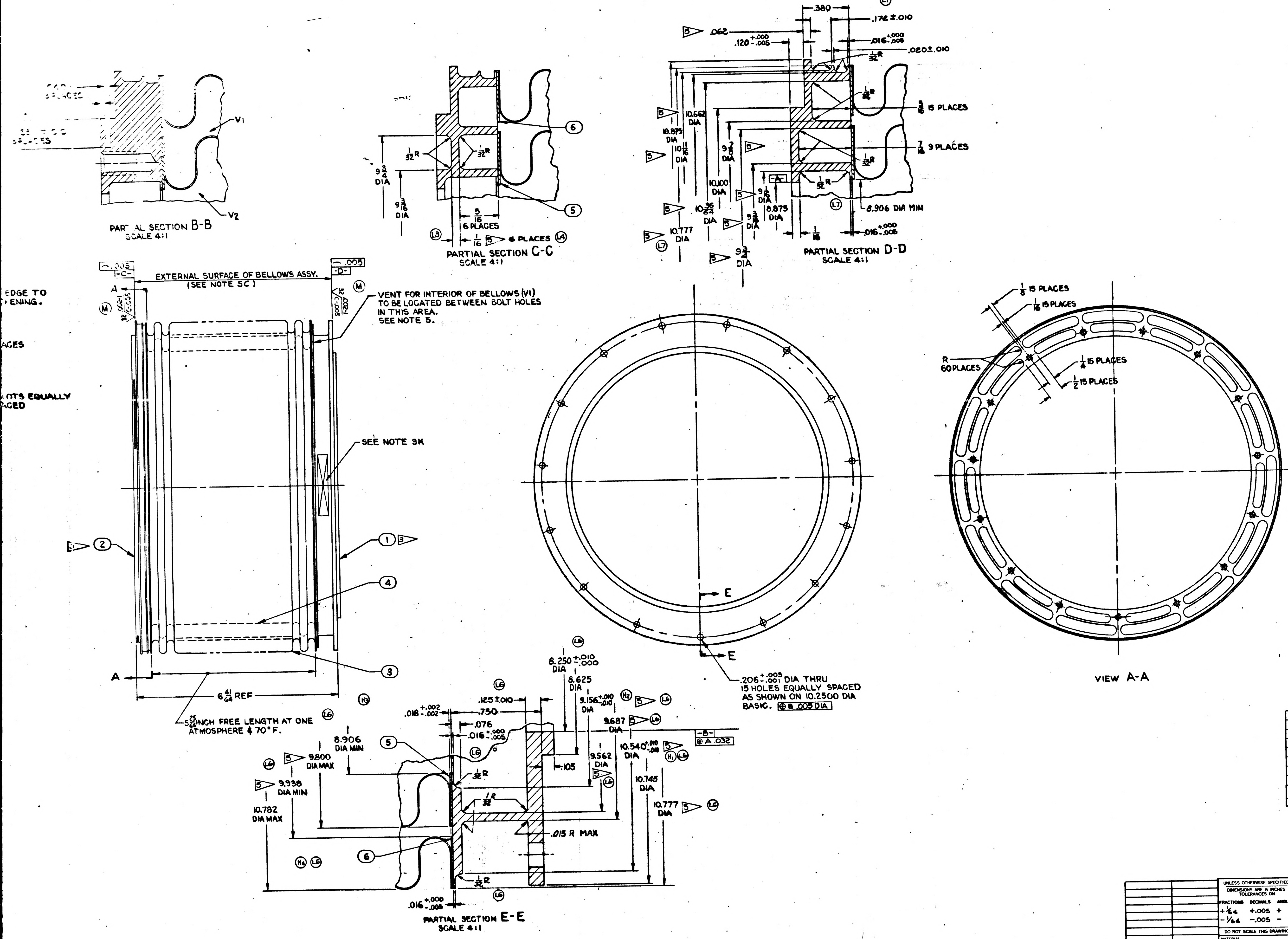
(B) EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7±.5 PSIA) AT ROOM TEMPERATURE (70±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.
(C) WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

(L1) 5▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ±$\frac{1}{32}$ FROM NOMINAL DIMENSION.


.040
3 PLACES
(L2)
.233±.010
3 PLACES
12
PARTIAL SECTION B-B
SCALE 4:1
⌒.005
-C-
EXTERNAL SURFACE OF BELLOWS AS
(SEE NOTE 5C)
16
A
D
D
R
12 PLACES
C
C
B
B
BREAK SHARP EDGE TO OBTAIN MIN OPENING. 6 PLACES
3/8 MIN, 6 PLACES
3 SLOTS EQUALLY SPACED
30°
1/2 3 PLACES
1/4 9 PLACES
#10-32 NF-3B THD
.285 MIN FULL THD
DO NOT BREAK THRU
BACK OF FLANGE.
15 HOLES EQUALLY SPACED ON
9.3750 DIA BASIC ⊕A .005 DIA
3▷ ②
A
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE
ATMOSPHERE & 70°F.
5▷ 9.938
DIA MIN
10.782
DIA MAX

1899952

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR CLASS A RELEASE TDR 01047		63	
H5		REVISED IN ACCORDANCE WITH TDRR 01499			
J		REVISED IN ACCORDANCE WITH TDRR 02515		20 AUG 63	RW
K		REVISED PER TDRR NO. 03671		21 OCT 63	
L7		REVISED PER TDRR NO. 04949		DEC 63	
M		REVISED PER TDRR NO. 05372			


PARTIAL SECTION B-B
SCALE 4:1
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
9 3/4 DIA
9 3/16 DIA
1/32 R
5/16 6 PLACES
1/16 6 PLACES
PARTIAL SECTION D-D
SCALE 4:1
.380
.172 ±.010
.062
.120 +.000 -.005
.016 +.000 -.005
.020 ±.010
1/32 R
5/16 15 PLACES
7/16 9 PLACES
10.662 DIA
10.875 DIA
10 11/16 DIA
9 7/8 DIA
10.100 DIA
10 35/64 DIA
9 1/2 DIA
9 3/4 DIA
8.875 DIA
10.777 DIA
9 3/4 DIA
-A-
1/32 R
8.906 DIA MIN
1/16
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
-C-
-D-
.005
EDGE TO ENING.
AGES
OTS EQUALLY AGED
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
A
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
E
.206 +.003 -.001 DIA THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC. ⊕ B .005 DIA
1/8 15 PLACES
1/16 15 PLACES
R 60 PLACES
1/4 15 PLACES
1/2 15 PLACES
VIEW A-A
8.250 +.010 -.000 DIA
8.625 DIA
9.156 +.010 -.010 DIA
9.687
-B-
⊚ A .032
.125 ±.010
.750
.076
.016 +.000 -.005
.018 +.002 -.002
8.906 DIA MIN
9.800 DIA MAX
9.938 DIA MIN
10.782 DIA MAX
.105
9.562 DIA
10.540 +.010 -.010 DIA
10.745 DIA
10.777 DIA
1/32 R
.015 R MAX
.016 +.000 -.005
PARTIAL SECTION E-E
SCALE 4:1
1
2
3
4
5
6

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899952-6	RING, ADAPTER OUTER
5	2	1899952-5	RING, ADAPTER INNER
4	1	1899952-4	BELLOWS, INNER
3	1	1899952-3	BELLOWS, OUTER
2	1	1899952-2	S/C END RING
1	1	1899952-1	OPTICS END RING

LIST OF PARTS AND MATERIALS

1899952

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00104 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+
-1/64	-.005	-

DO NOT SCALE THIS DRAWING

MATERIAL 1 2

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 14 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 4/2/62
MIT APPROVAL 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SXT

CODE IDENT NO. | SIZE J | 1899952

SCALE 1:1 | SHEET

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

2. MATERIAL:

▷ QQ-S-763, CL 32 STAINLESS STEEL

2▷ MIL-S-6721, CL321 STAINLESS STEEL

3. REQUIREMENTS:

(A) PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

(C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611

(D) WELDING TO BE INSPECTED PER MIL-I-6866

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005-.015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS NOT TO EXCEED $\sqrt{125}$

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 244 #/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3 ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE)*.

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE.)

Ⓗ5 4▷ (M) *THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE $\pm\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

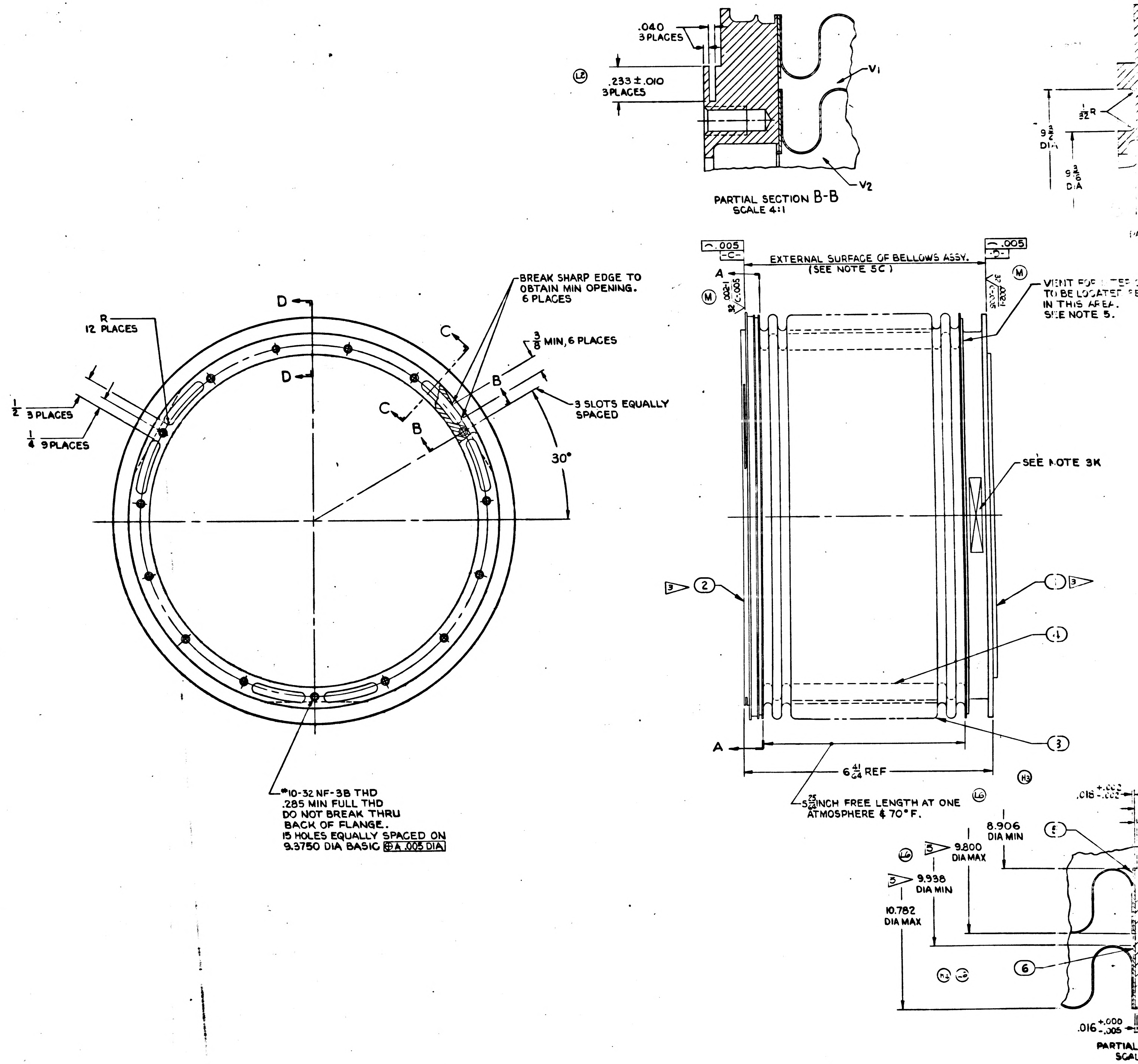
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

(B) EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7 ± .5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

(C) WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

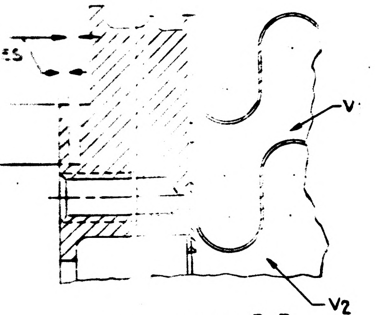
3▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED $\pm\frac{1}{32}$ FROM NOMINAL DIMENSION.


.040
3 PLACES
Ⓛ2
.233 ± .010
3 PLACES
V1
V2
$\frac{1}{32}$R
$9\frac{3}{2}$ DIA
$9\frac{3}{6}$ DIA
D
R
12 PLACES
$\frac{1}{2}$ 3 PLACES
$\frac{1}{4}$ 9 PLACES
C
B
BREAK SHARP EDGE TO OBTAIN MIN OPENING. 6 PLACES
$\frac{3}{8}$ MIN, 6 PLACES
3 SLOTS EQUALLY SPACED
30°
10-32 NF-3B THD .285 MIN FULL THD DO NOT BREAK THRU BACK OF FLANGE. 15 HOLES EQUALLY SPACED ON 9.3750 DIA BASIC ⊕ A .005 DIA
⌒ .005 -C-
⌒ .005 -D-
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
A
Ⓜ
32 .002-1 C-.005
VENT FOR TEST TO BE LOCATED IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
3▷ ②
① 3▷
④
③
$6\frac{41}{64}$ REF
$5\frac{25}{64}$ INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
Ⓗ3
Ⓛ6
8.906 DIA MIN
5▷ 9.800 DIA MAX
3▷ 9.938 DIA MIN
10.782 DIA MAX
⑤
⑥
.018 +.002 -.002
.016 +.000 -.005
PARTIAL
SCAL

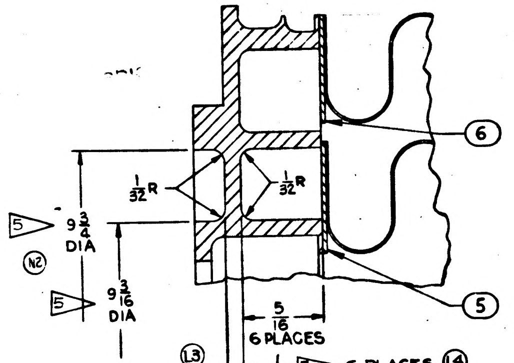
PARTIAL SECTION B-B
SCALE 4:1

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR CLASS A RELEASE TDR 01047		APR 63	
H5		REVISED IN ACCORDANCE WITH TDRR 01499			
J		REVISED IN ACCORDANCE WITH TDRR 02515		20 AUG 63	RWG
K		REVISED PER TDRR NO. 03671		21 OCT 63	
L7		REVISED PER TDRR NO. 04949		11 DEC 63	
M		REVISED PER TDRR NO. 05372		JAN 64	
N		REVISED PER TDRR NO. 05726		20 JAN 64	

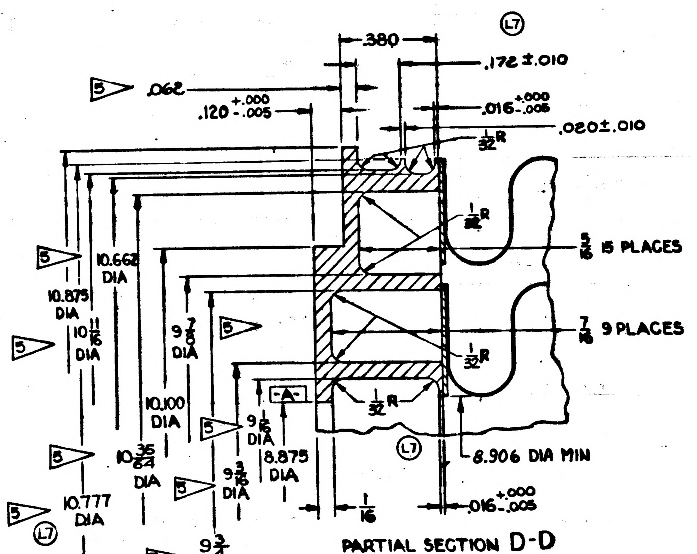
REVISIONS



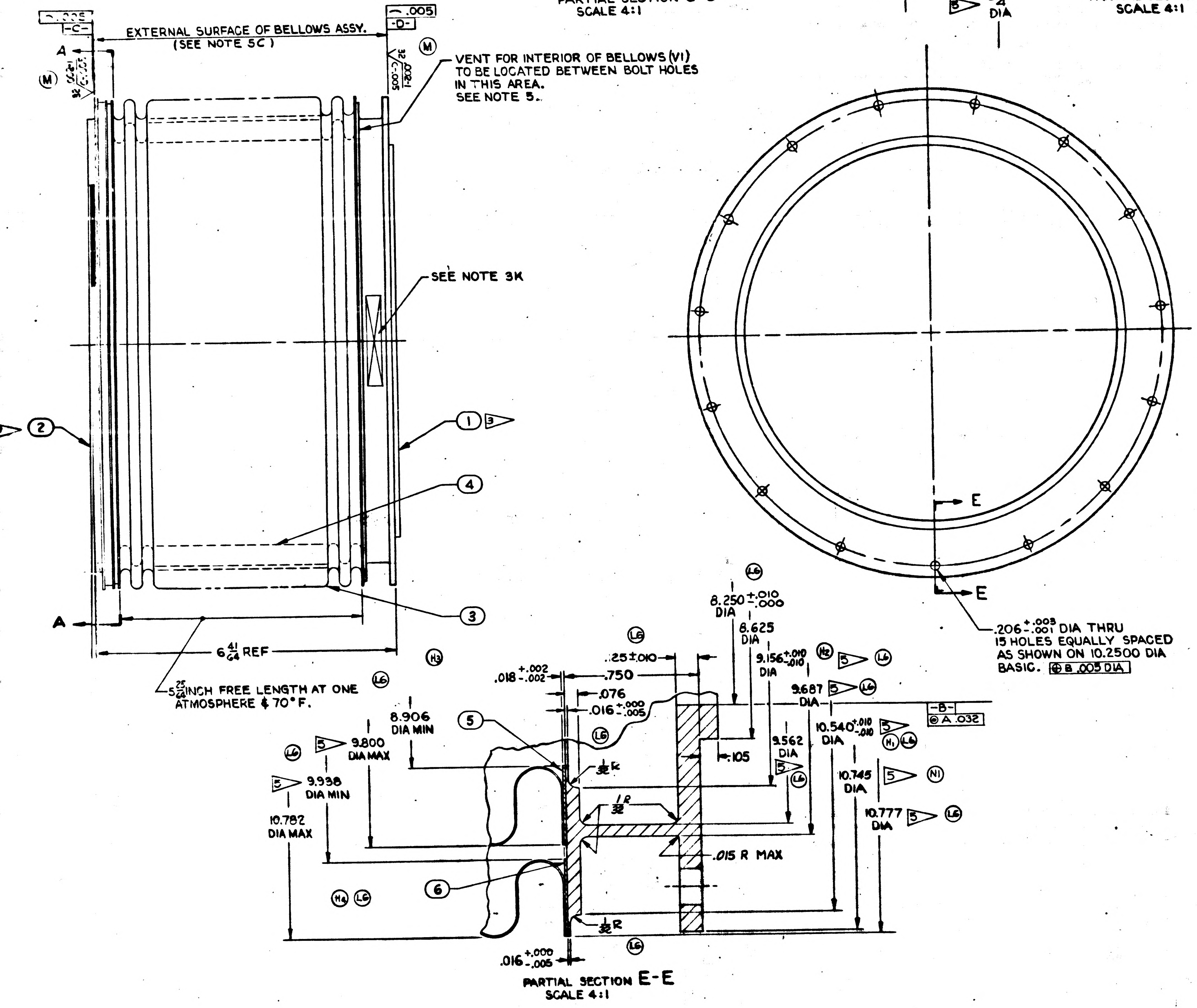
PARTIAL SECTION B-B
SCALE 4:1


6
5
1/32 R
1/32 R
5 9 3/4 DIA
N2
5 9 3/16 DIA
5/16 6 PLACES
L3
1/16 5 6 PLACES
L4

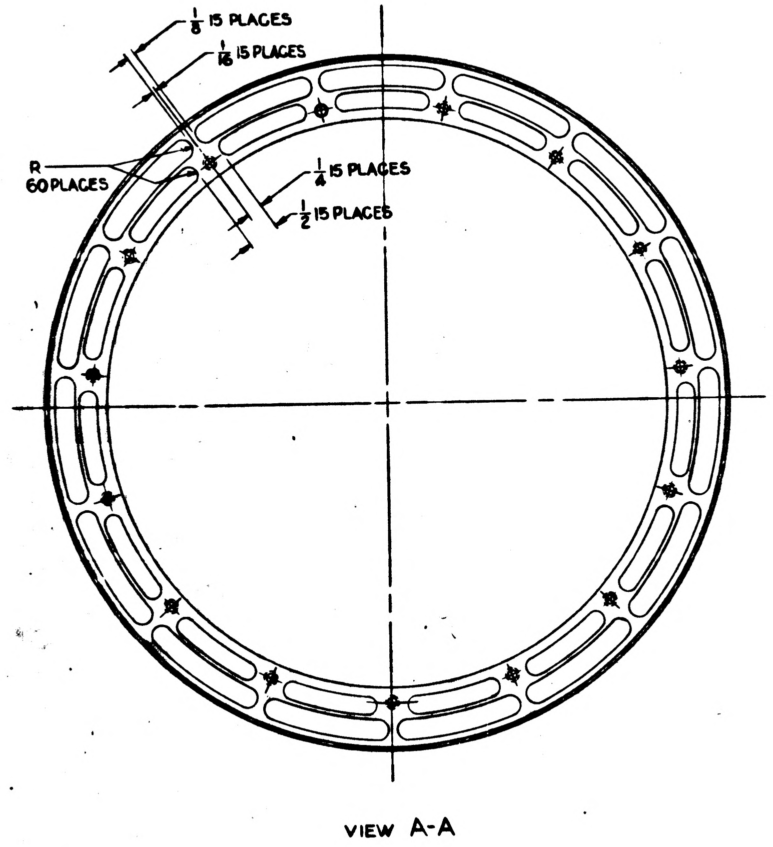
PARTIAL SECTION C-C
SCALE 4:1


L7
.380
.172 ±.010
5 .062
.120 +.000 -.005
.016 +.000 -.005
.020 ±.010
1/32 R
5/16 15 PLACES
7/16 9 PLACES
1/32 R
1/32 R
-A-
5 10.662 DIA
10.875 DIA
5 10 11/16 DIA
9 7/8 DIA
5
10.100 DIA
5 10 35/64 DIA
5 9 1/16 DIA
8.875 DIA
5 9 3/16 DIA
5 10.777 DIA
L7
5 9 3/4 DIA
L7
8.906 DIA MIN
1/16
.016 +.000 -.005

PARTIAL SECTION D-D
SCALE 4:1


.005
-C-
A
M
32 .002-1 C-.005
EXTERNAL SURFACE OF BELLOWS ASSY.
(SEE NOTE 5C)
.005
-D-
M
32 .002-1 C-.005
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
2
1 3
4
3
A
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70° F.
L6
H3
E
E
.206 +.003 -.001 DIA THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC. ⊕ B .005 DIA
L6
8.250 +.010 -.000 DIA
8.625 DIA
L6
.25 ±.010
.018 +.002 -.002
.750
9.156 +.010 -.010 DIA
H2 5 L6
9.687 5 L6 DIA
-B-
⊚ A .032
.076
.016 +.000 -.005
L6
5
8.906 DIA MIN
5 9.800 DIA MAX
L6
5 9.938 DIA MIN
10.782 DIA MAX
1/32 R
.105
9.562 DIA
5 L6
10.540 +.010 -.010 DIA
5 H1 L6
1/32 R
10.745 DIA
5 N1
10.777 DIA 5 L6
.015 R MAX
6
H4 L6
1/32 R
L6
.016 +.000 -.005

PARTIAL SECTION E-E
SCALE 4:1


1/8 15 PLACES
1/16 15 PLACES
R 60 PLACES
1/4 15 PLACES
1/2 15 PLACES

VIEW A-A

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899952-6	RING, ADAPTER OUTER 2 4
5	2	1899952-5	RING, ADAPTER INNER 2
4	1	1899952-4	BELLOWS, INNER
3	1	1899952-3	BELLOWS, OUTER
2	1	1899952-2	S/C END RING
1	1	1899952-1	OPTICS END RING

LIST OF PARTS AND MATERIALS

1899952

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00104 DATE

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES + -
DO NOT SCALE THIS DRAWING
MATERIAL 1 2
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 14 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 4/2/62
MIT APPROVAL 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SXT

CODE IDENT NO.
SIZE J
1899952
SCALE 1:1
SHEET

3H

18 99952

F-2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

① QQ-S-763, CL321 STAINLESS STEEL

② MIL-S-6721, CL321 STAINLESS STEEL

3. REQUIREMENTS:

(A) PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

③ (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611

(D) WELDING TO BE INSPECTED PER MIL-I-6866

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005-.015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS NOT TO EXCEED 125√

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 244 #/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3 ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE).*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE.)

(H5) ④ (M) *THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ± $\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

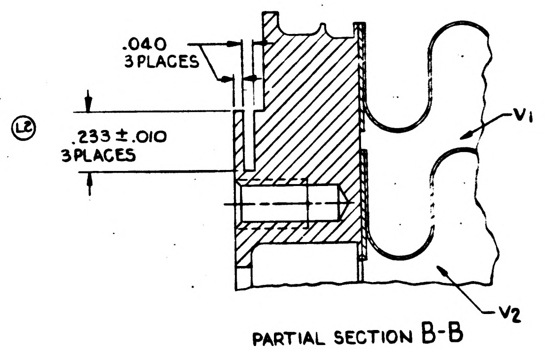
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

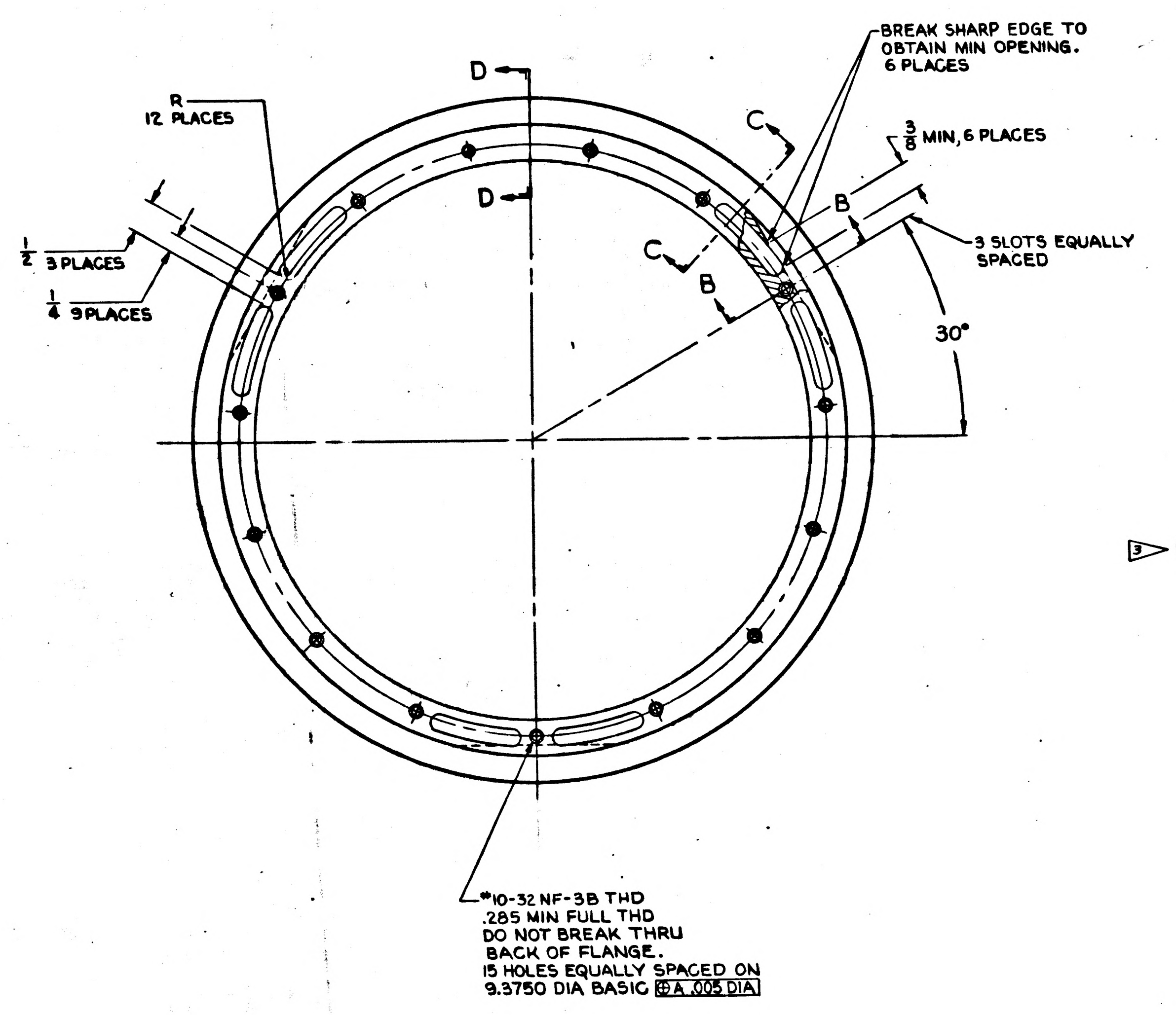
(B) EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.998%) AND 20% PURIFIED HELIUM (99.995%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7 ± .5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

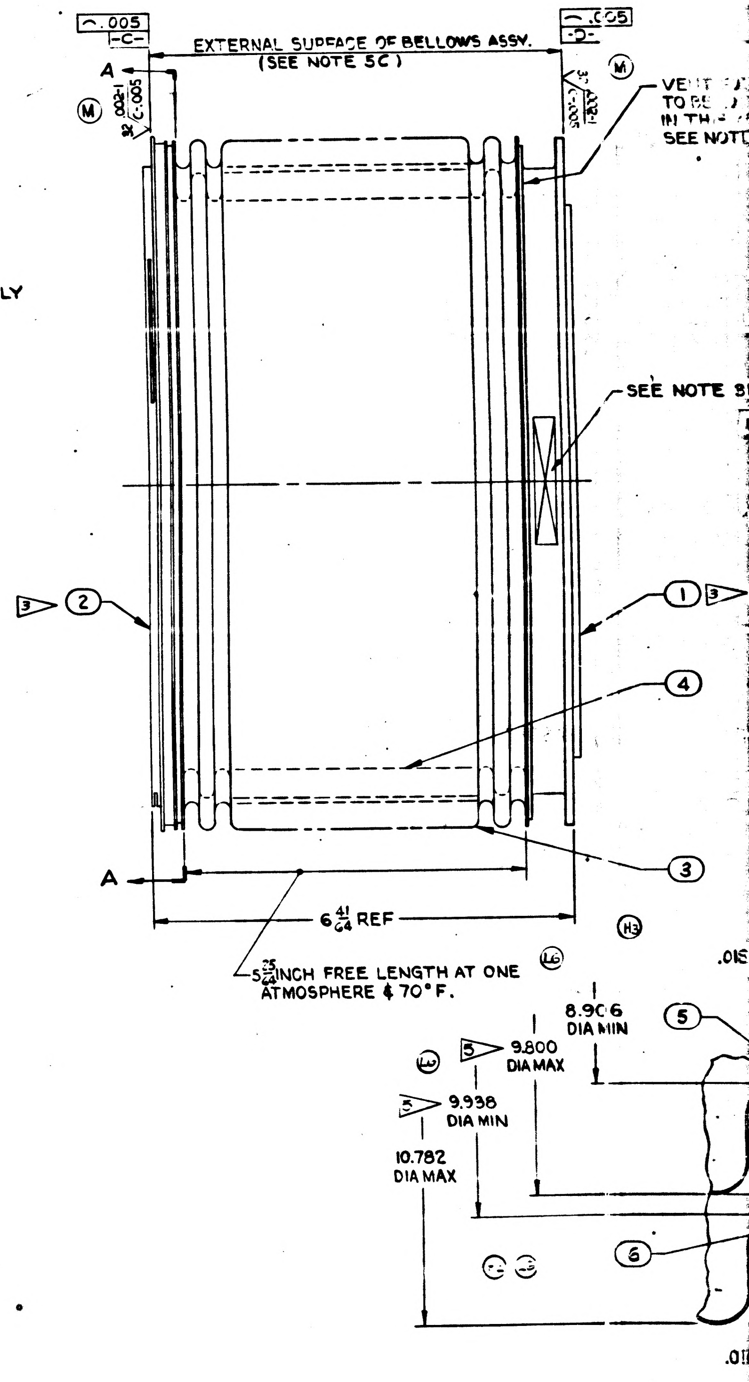
(C) WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

(L1) ⑤ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ± $\frac{1}{32}$ FROM NOMINAL DIMENSION.

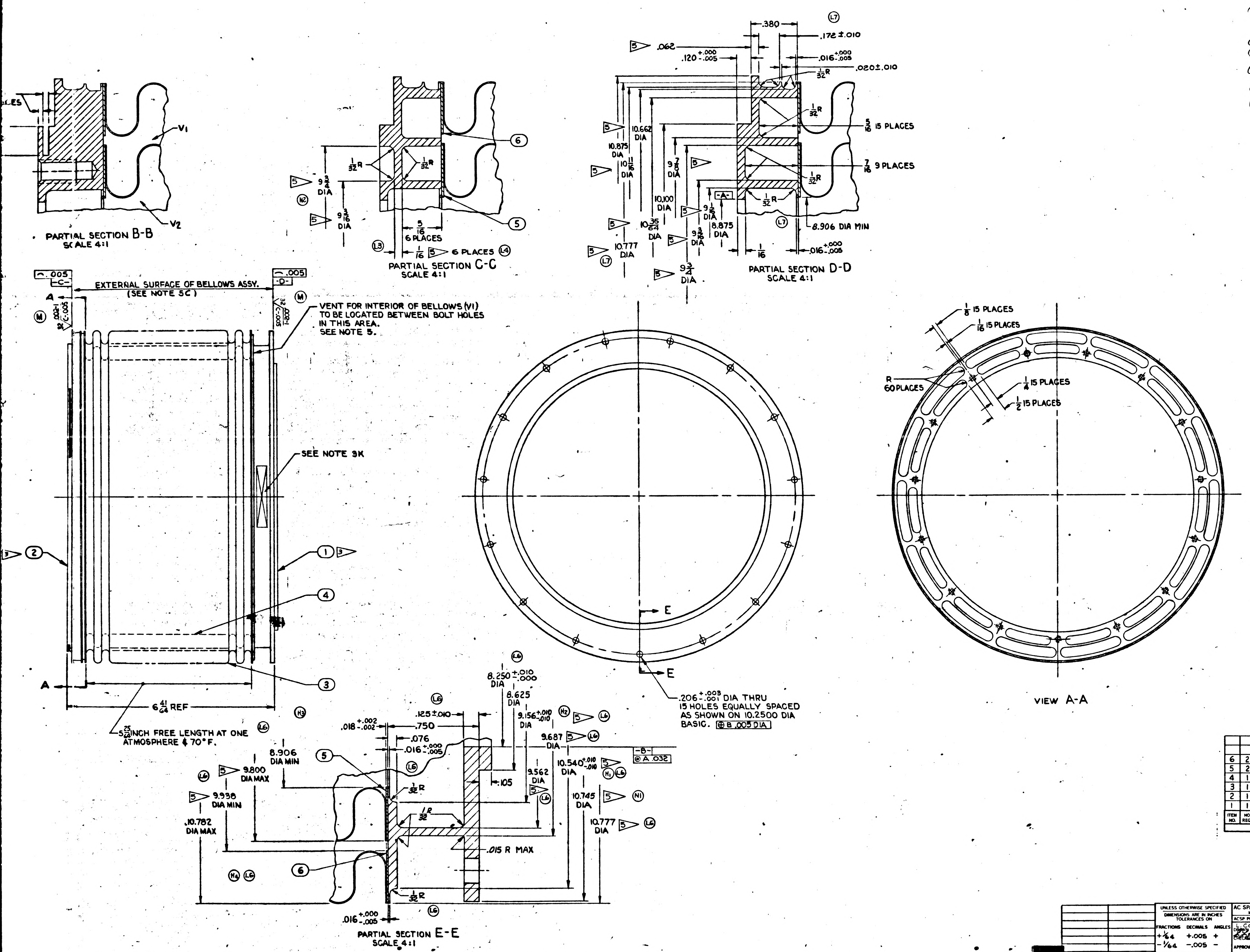

.040
3 PLACES
(L2)
.233 ± .010
3 PLACES
V1
V2

PARTIAL SECTION B-B
SCALE 4:1


D
D
R
12 PLACES
1/2 3 PLACES
1/4 9 PLACES
C
C
B
B
BREAK SHARP EDGE TO OBTAIN MIN OPENING.
6 PLACES
3/8 MIN, 6 PLACES
3 SLOTS EQUALLY SPACED
30°
#10-32 NF-3B THD
.285 MIN FULL THD
DO NOT BREAK THRU
BACK OF FLANGE.
15 HOLES EQUALLY SPACED ON
9.3750 DIA BASIC ⊕A .005 DIA


.005
-C-
.005
-D-
EXTERNAL SURFACE OF BELLOWS ASSY.
(SEE NOTE 5C)
A
A
M
M
VENT
SEE NOTE
SEE NOTE 3
③ ②
① ③
④
③
6 41/64 REF
(H3)
(L4)
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
8.906
DIA MIN
⑤ 9.800
DIA MAX
⑤ 9.938
DIA MIN
10.782
DIA MAX
⑤
⑥

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED TO CLASS A RELEASE		[illegible] APR 63	
H5		REVISED IN ACCORDANCE WITH TDRR 01499			
J		REVISED IN ACCORDANCE WITH TDRR 02515		26 AUG 63	
K		REVISED PER TDRR NO. 03671		21 OCT 63	WK
L7		REVISED PER TDRR NO. 04949		11 DEC 63	
M		REVISED PER TDRR NO. 05372		6 JAN 64	WK
N		REVISED PER TDRR NO. 05726		20 JAN 64	WK
P		REVISED PER TDRR 07595	-	19 APR 64	


PARTIAL SECTION B-B
SCALE 4:1
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
$\frac{1}{32}$R
⑥
⑤
$9\frac{3}{4}$ DIA
$9\frac{3}{16}$ DIA
$\frac{5}{16}$ 6 PLACES
$\frac{1}{16}$ 5 6 PLACES
PARTIAL SECTION D-D
SCALE 4:1
.380
.172 ±.010
.062
.120 +.000 -.005
.016 +.000 -.005
.020 ±.010
$\frac{5}{16}$ 15 PLACES
$\frac{7}{16}$ 9 PLACES
10.662 DIA
10.875 DIA
$10\frac{11}{16}$ DIA
$9\frac{7}{8}$ DIA
10.100 DIA
$10\frac{35}{64}$ DIA
$9\frac{1}{16}$ DIA
8.875 DIA
$9\frac{3}{16}$ DIA
10.777 DIA
$9\frac{3}{4}$ DIA
-A-
8.906 DIA MIN
.005 -C-
.005 -D-
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
A
A
① ② ③ ④
$6\frac{41}{64}$ REF
$5\frac{25}{64}$ INCH FREE LENGTH AT ONE ATMOSPHERE & 70° F.
E
E
.206 +.003 -.001 DIA THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC. ⊕ B .005 DIA
$\frac{1}{8}$ 15 PLACES
$\frac{1}{16}$ 15 PLACES
R 60 PLACES
$\frac{1}{4}$ 15 PLACES
$\frac{1}{2}$ 15 PLACES
VIEW A-A
PARTIAL SECTION E-E
SCALE 4:1
8.250 +.010 -.000 DIA
8.625 DIA
.125 ±.010
.750
.018 +.002 -.002
.076
.016 +.000 -.005
9.156 +.010 -.010 DIA
9.687 DIA
-B- ◎ A .032
.105
8.906 DIA MIN
9.800 DIA MAX
9.938 DIA MIN
10.782 DIA MAX
9.562 DIA
10.540 +.010 -.010 DIA
10.745 DIA
10.777 DIA
$\frac{1}{32}$R
.015 R MAX
.016 +.000 -.005

6	2	1899952-6	RING, ADAPTER OUTER 2 4
5	2	1899952-5	RING, ADAPTER INNER 2
4	1	1899952-4	BELLOWS, INNER 2
3	1	1899952-3	BELLOWS, OUTER 2
2	1	1899952-2	S/C END RING 1
1	1	1899952-1	OPTICS END RING 1
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00104 DATE

1899950-011	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES + - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN L. COOPER 14 NOV 62 CHECKED 14 NOV 62 APPROVAL 14 Nov 62 APPROVAL 14 NOV 62
NEXT ASSY	USED ON	MATERIAL 1 2	NASA APPROVAL 1/2/62 MIT APPROVAL 21 NOV 62
APPLICATION		CONTRACT NAS-9-497	

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SXT

CODE IDENT NO. | SIZE J | 1899952
SCALE 1:1 | SHEET

2

18199952 N

1899952

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763, CL321 STAINLESS STEEL

2▷ MIL-S-6721, CL321 STAINLESS STEEL

3. REQUIREMENTS:

(A) PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

3▷ (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611

(D) WELDING TO BE INSPECTED PER MIL-I-6866

(E) UNLESS OTHERWISE SPECIFIED:
1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005-.015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS NOT TO EXCEED 125√

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF 5/16 INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3F ABOVE, THE AXIAL SPRING RATE AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 244 #/IN.

(J) BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3 ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE)*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE.)

(H5) 4▷ (M) *THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ± 1/4 INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5-10 CPS	.30 INCH DOUBLE AMPLITUDE
10-20 CPS	± 1.5 G'S
20-63 CPS	.07 INCH DOUBLE AMPLITUDE
63-2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

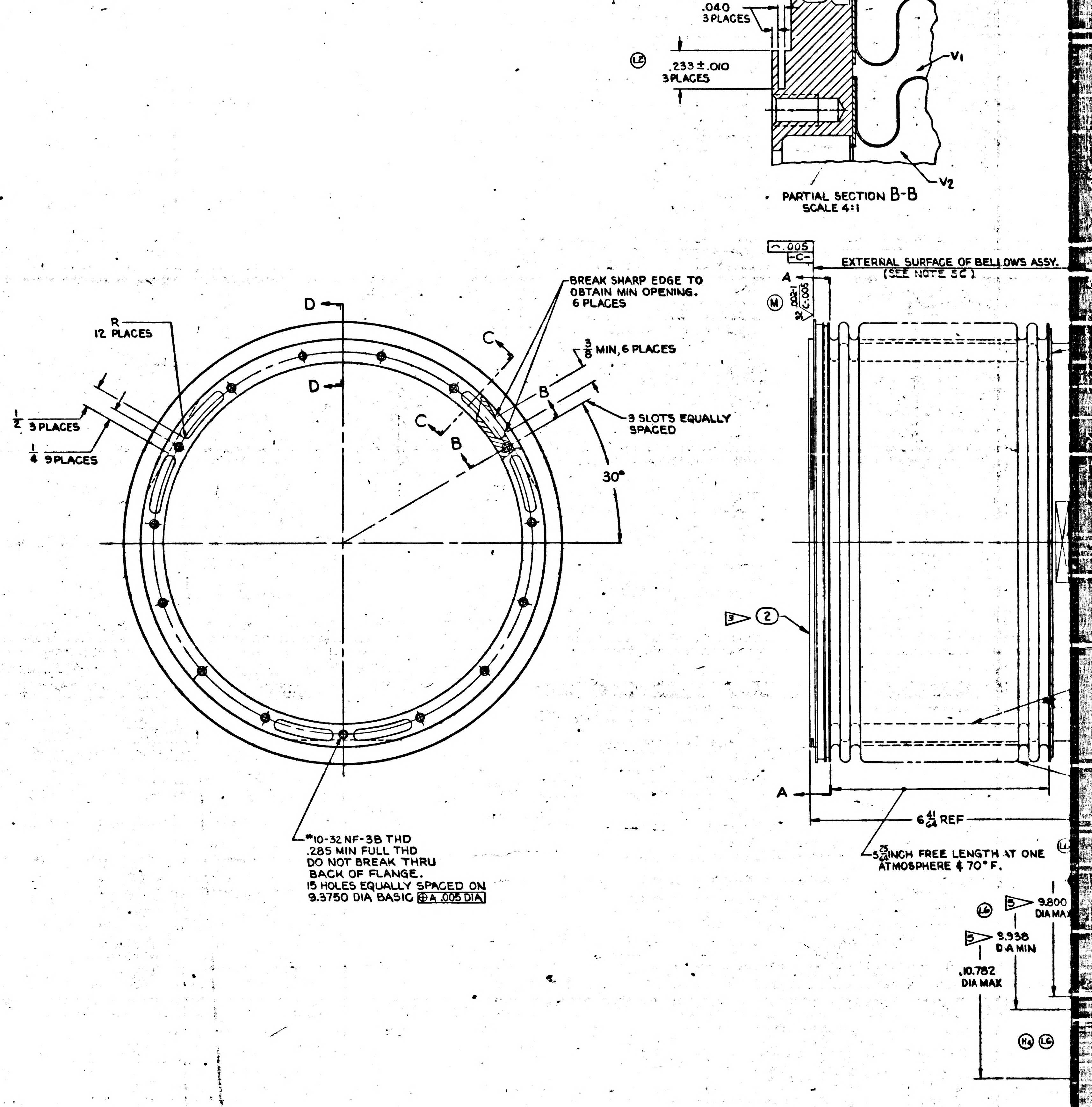
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

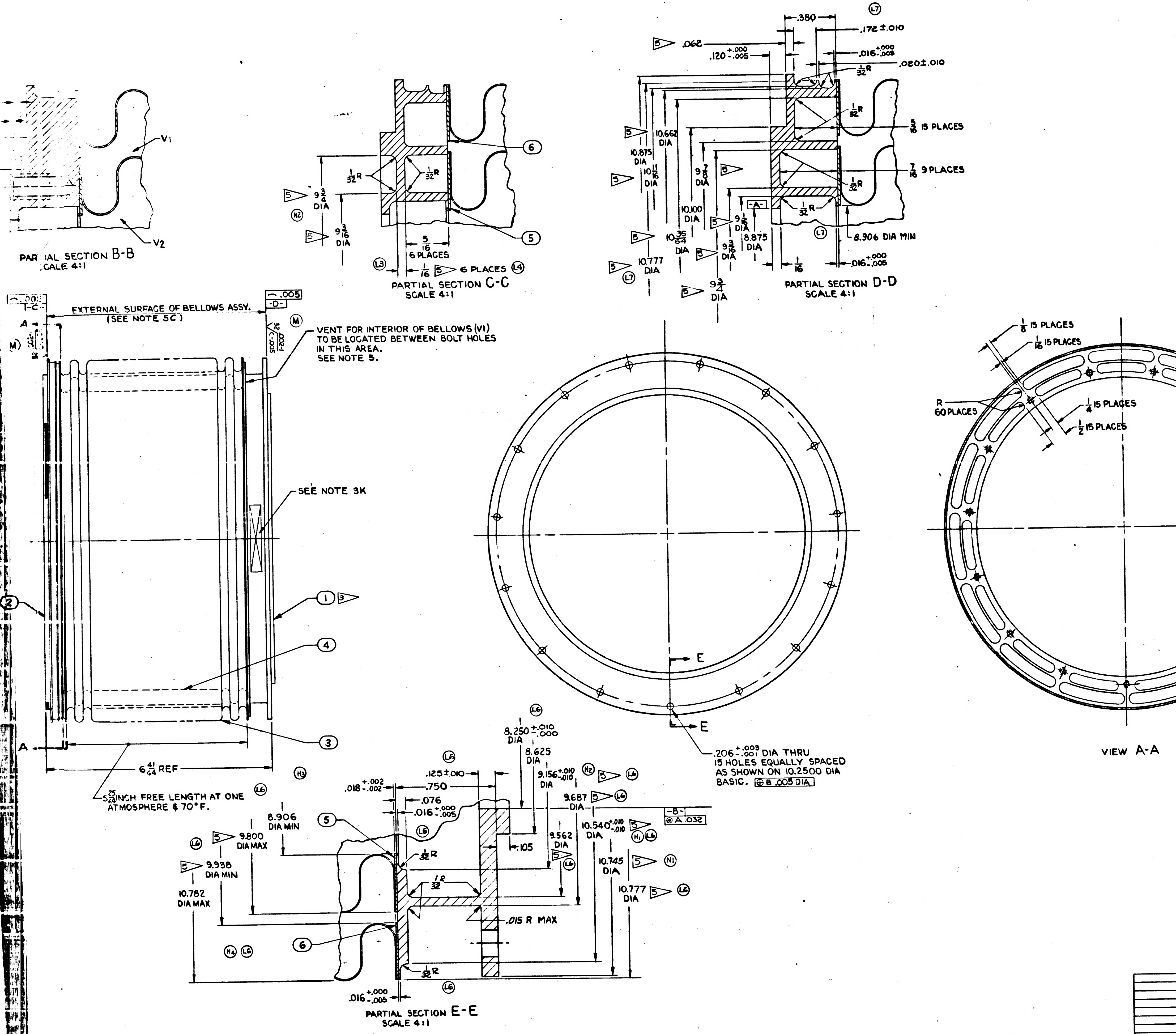
(B) EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7 ± .5 PSIA) AT ROOM TEMPERATURE (70 ± 5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

(C) WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

(L1) 5▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ± 1/32 FROM NOMINAL DIMENSION.


.040
3 PLACES
(L2)
.233 ± .010
3 PLACES
V1
V2
PARTIAL SECTION B-B
SCALE 4:1
.005
-C-
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
A
(M)
32 .002-1 C-.005
D
D
R
12 PLACES
1/2 3 PLACES
1/4 9 PLACES
C
C
B
B
BREAK SHARP EDGE TO OBTAIN MIN OPENING. 6 PLACES
3/8 MIN, 6 PLACES
3 SLOTS EQUALLY SPACED
30°
*10-32 NF-3B THD
.285 MIN FULL THD
DO NOT BREAK THRU
BACK OF FLANGE.
15 HOLES EQUALLY SPACED ON
9.3750 DIA BASIC ⊕A .005 DIA
3▷ ②
A
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70° F.
(L6)
5▷ 9.800 DIA MAX
5▷ 9.938 DIA MIN
10.782 DIA MAX
(H6) (L6)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR CLASS A RELEASE TDR 01047		27 APR 63	A.J.F.
H5		REVISED IN ACCORDANCE WITH TDRR 01499			WK
J		REVISED IN ACCORDANCE WITH TDRR 02515		20 AUG 63	RWG
K		REVISED PER TDRR NO. 03671		21 OCT 63	WK
L7		REVISED PER TDRR NO. 04949		11 DEC 63	WK
M		REVISED PER TDRR NO. 05372		6 JAN 64	WK
N		REVISED PER TDRR NO. 05726		20 JAN 64	WK
P		REVISED PER TDRR 07595	-	APR 64	JHR
R		REVISED PER TDRR 10518	-	[illegible]	J.V.


PARTIAL SECTION B-B
SCALE 4:1
V1
V2
PARTIAL SECTION C-C
SCALE 4:1
9 3/4 DIA
9 3/16 DIA
1/32 R
5/16
6 PLACES
1/16
6 PLACES
PARTIAL SECTION D-D
SCALE 4:1
.380
.172±.010
.062
.120 +.000 -.005
.016 +.000 -.005
.020±.010
1/32 R
5/16 15 PLACES
7/16 9 PLACES
10.662 DIA
10.875 DIA
10 11/16 DIA
9 7/8 DIA
10.100 DIA
10 35/64 DIA
9 11/16 DIA
8.875 DIA
9 3/16 DIA
9 3/4 DIA
10.777 DIA
-A-
8.906 DIA MIN
1/16
.016 +.000 -.005
EXTERNAL SURFACE OF BELLOWS ASSY. (SEE NOTE 5C)
.005
-D-
-C-
VENT FOR INTERIOR OF BELLOWS (V1) TO BE LOCATED BETWEEN BOLT HOLES IN THIS AREA. SEE NOTE 5.
SEE NOTE 3K
A
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70°F.
E
.206 +.003 -.001 DIA THRU 15 HOLES EQUALLY SPACED AS SHOWN ON 10.2500 DIA BASIC. ⊕ B .005 DIA
1/8 15 PLACES
1/16 15 PLACES
R 60 PLACES
1/4 15 PLACES
1/2 15 PLACES
VIEW A-A
8.250 +.010 -.000 DIA
8.625 DIA
.125±.010
.750
.018 +.002 -.002
.076
.016 +.000 -.005
9.156 +.010 -.010 DIA
9.687 DIA
-B-
⊚ A .032
.105
8.906 DIA MIN
9.800 DIA MAX
9.938 DIA MIN
10.782 DIA MAX
9.562 DIA
10.540 +.010 -.010 DIA
10.745 DIA
10.777 DIA
1/32 R
.015 R MAX
PARTIAL SECTION E-E
SCALE 4:1

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
6	2	1899952-6	RING, ADAPTER OUTER 2 4
5	2	1899952-5	RING, ADAPTER INNER 2
4	1	1899952-4	BELLOWS, INNER 2
3	1	1899952-3	BELLOWS, OUTER 2
2	1	1899952-2	S/C END RING 1
1	1	1899952-1	OPTICS END RING 1

LIST OF PARTS AND MATERIALS

1899952

FOR INFORMATION ONLY

~~CLASS B RELEASE~~ TDR No. 00104 DATE

1899950-011	1899950-011	
NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+
-1/64	-.005	-

DO NOT SCALE THIS DRAWING

MATERIAL 1 2

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 14 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 Nov 62
NASA APPROVAL 11/21/62
MIT APPROVAL 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SXT

CODE IDENT NO. SIZE J 1899952

SCALE 1:1 APPROX.WT. 7LB 4OZ SHEET

1899952

27/1899952

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

2. MATERIAL:

1▷ QQ-S-763, CL321 STAINLESS STEEL

2▷ MIL-S-6721, CL321 STAINLESS STEEL

3. REQUIREMENTS:

(A) PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

3▷ (C) INERT HELI-ARC WELD ITEMS ③④⑤⑥ TO ITEM ① AND WELD ITEMS ③④⑤⑥ TO ITEM ② PER MIL-W-8611

(D) WELDING TO BE INSPECTED PER MIL-I-6866

(E) UNLESS OTHERWISE SPECIFIED:
  1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005-.015 RADIUS OR CHAMFER.
  2. SURFACE ROUGHNESS NOT TO EXCEED $\sqrt{}^{125}$

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3⁻ ABOVE, THE AXIAL SPRING RATES ~~AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 244#/IN~~ SHALL NOT EXCEED 300#/IN IN COMPRESSION AND 260#/IN TENSION. THE RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 1150#/IN.

(J) VENDOR SHIPPING REQUIREMENTS.
BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3 ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER* ND 1002023 *(NAMEPLATE PERMISSIBLE)*.

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE.)

(H5) 4▷ *(M) THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

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SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
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63-2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

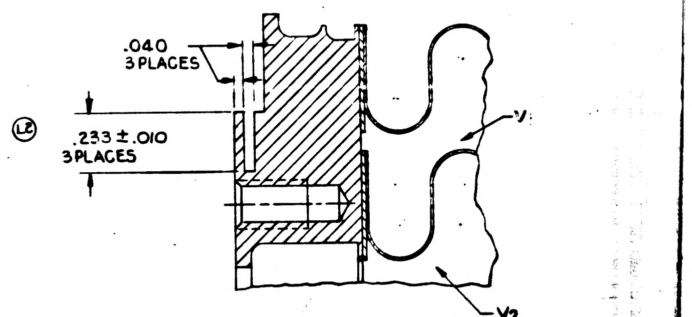
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

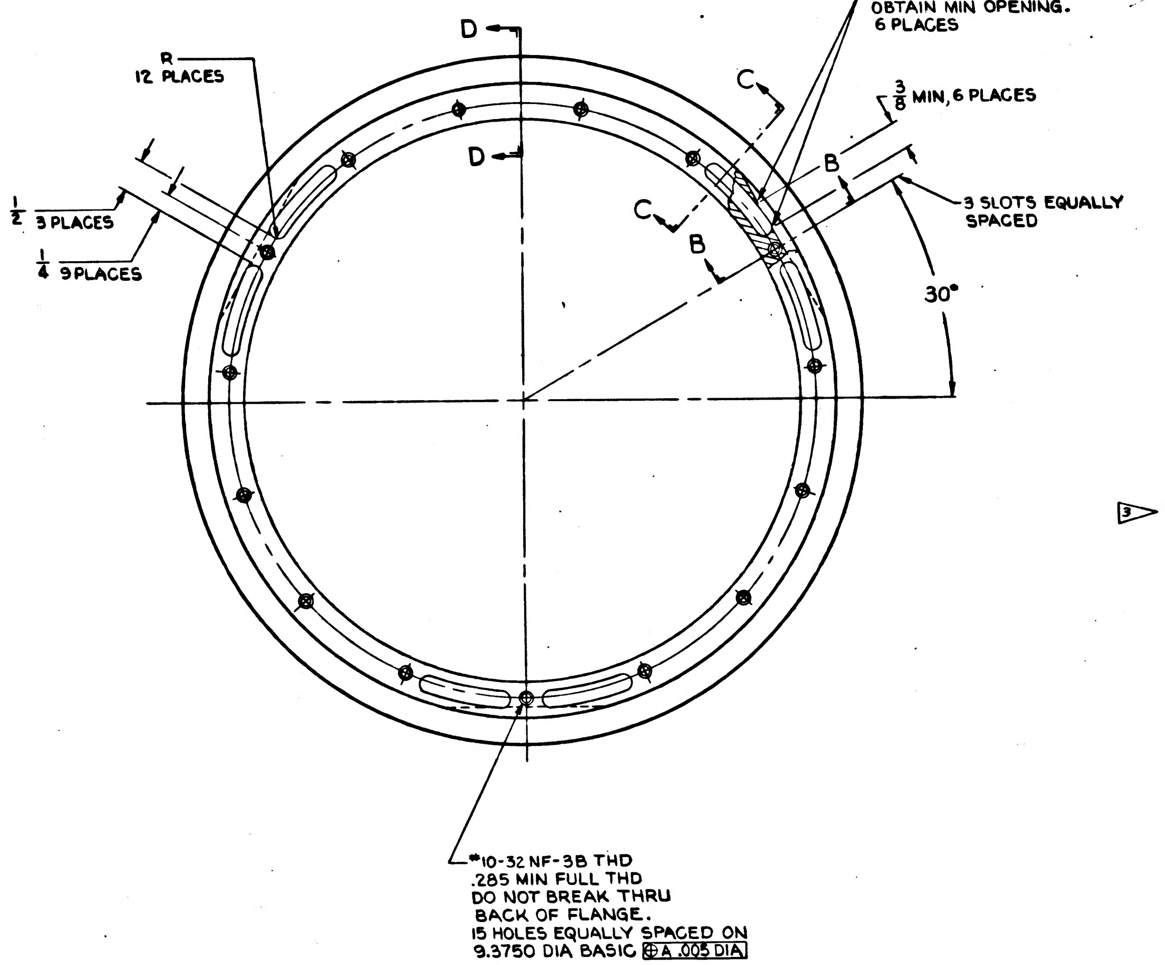
(B) EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7 ±.5 PSIA) AT ROOM TEMPERATURE (70 ±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

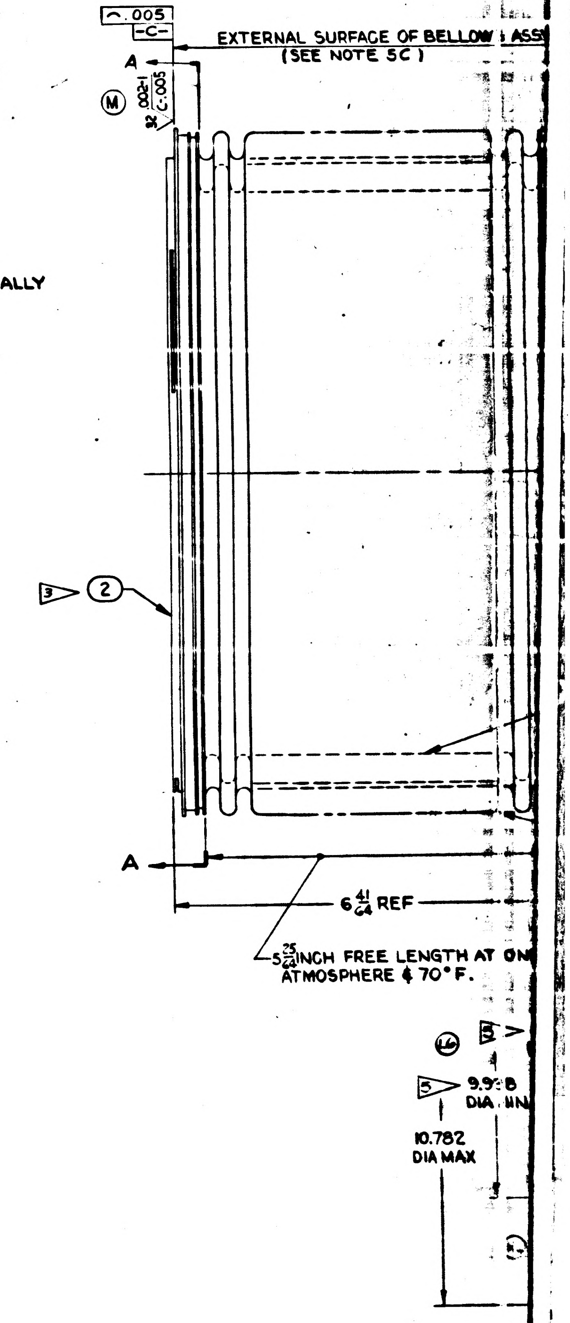
(C) WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

5▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ± $\frac{1}{32}$ FROM NOMINAL DIMENSION.



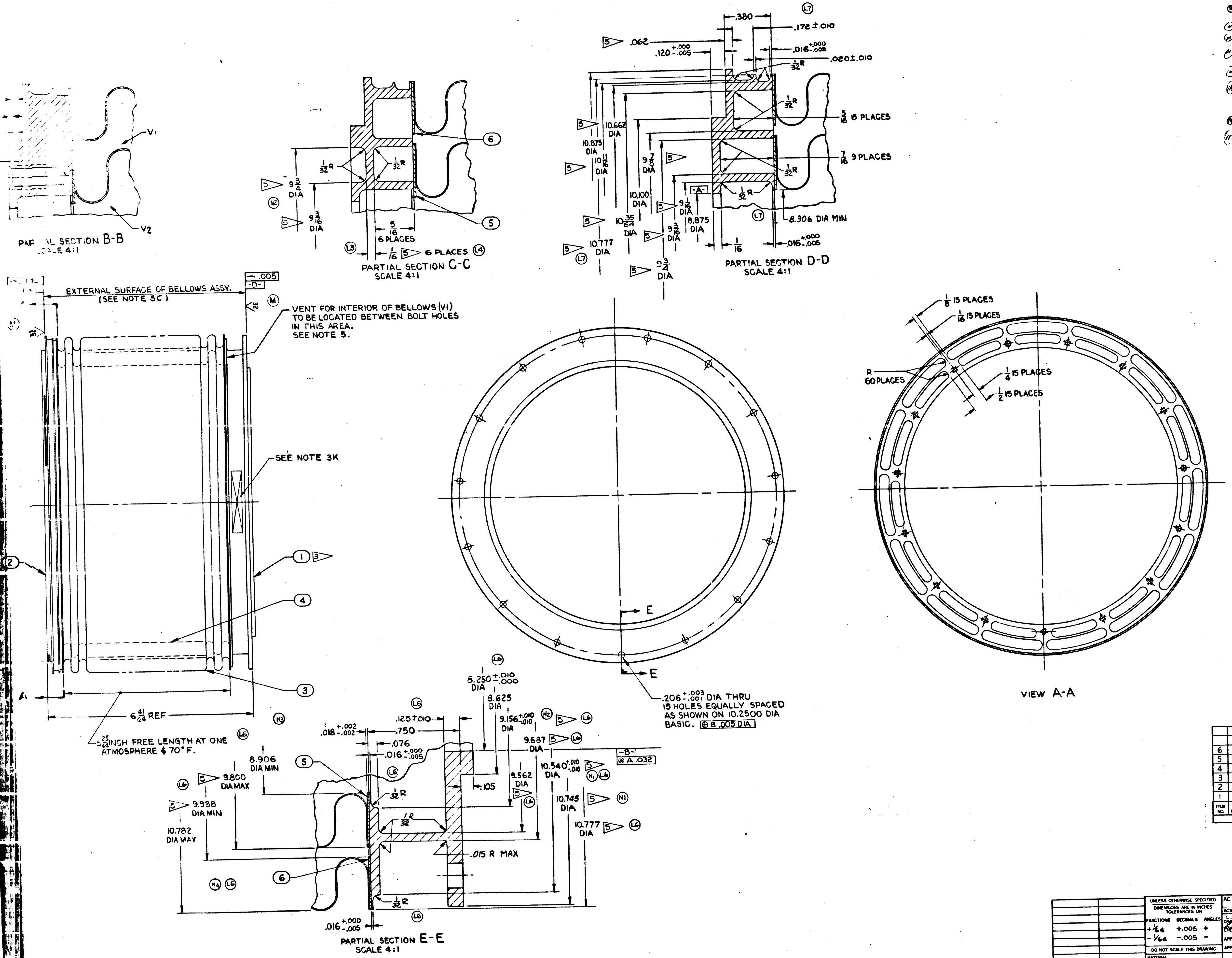
PARTIAL SECTION B-B
SCALE 4:1


D
D
C
C
B
B
R
12 PLACES
$\frac{1}{2}$ 3 PLACES
$\frac{1}{4}$ 9 PLACES
BREAK SHARP EDGE TO OBTAIN MIN OPENING. 6 PLACES
$\frac{3}{8}$ MIN, 6 PLACES
3 SLOTS EQUALLY SPACED
30°
#10-32 NF-3B THD .285 MIN FULL THD DO NOT BREAK THRU BACK OF FLANGE. 15 HOLES EQUALLY SPACED ON 9.3750 DIA BASIC ⊕A .005 DIA



1899952

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR CLASS A RELEASE TDR 01047		27 APR 63	AJF
H5		REVISED IN ACCORDANCE WITH TDRR 01499			WK
J		REVISED IN ACCORDANCE WITH TDRR 02515		20 AUG 63	RNG
K		REVISED PER TDRR NO. 03671		21 OCT 63	WK
L7		REVISED PER TDRR NO. 04949		11 DEC 63	WK
M		REVISED PER TDRR NO. 05372		6 JAN 64	WK
N		REVISED PER TDRR NO. 05726		20 JAN 64	WK
P		REVISED PER TDRR 07595	-	APR 66	JHR
R		REVISED PER TDRR .0518	-	[illegible]	JN
S		REVISED PER TDRR 11626	-	[illegible] 64	JNP



V1
V2
PARTIAL SECTION B-B
SCALE 4:1
1/32 R
1/32 R
6
5
9 3/4 DIA
9 3/16 DIA
5/16 6 PLACES
1/16 6 PLACES
L3
L4
N2
PARTIAL SECTION C-C
SCALE 4:1
.380
.172 ±.010
.062
.120 +.000 -.005
.016 +.000 -.005
.020 ±.010
1/32 R
5/16 15 PLACES
7/16 9 PLACES
10.875 DIA
10.662 DIA
10 11/16 DIA
9 7/8 DIA
10.100 DIA
10 35/64 DIA
9 1/16 DIA
8.875 DIA
9 3/16 DIA
10.777 DIA
9 3/4 DIA
-A-
8.906 DIA MIN
1/16
.016 +.000 -.005
L7
PARTIAL SECTION D-D
SCALE 4:1
EXTERNAL SURFACE OF BELLOWS ASSY.
(SEE NOTE 5C)
.005
-D-
M
VENT FOR INTERIOR OF BELLOWS (V1)
TO BE LOCATED BETWEEN BOLT HOLES
IN THIS AREA.
SEE NOTE 5.
SEE NOTE 3K
1
2
3
4
A
6 41/64 REF
5 25/64 INCH FREE LENGTH AT ONE ATMOSPHERE & 70° F.
H3
E
E
.206 +.003 -.001 DIA THRU
15 HOLES EQUALLY SPACED
AS SHOWN ON 10.2500 DIA
BASIC. ⊕ B .005 DIA
1/8 15 PLACES
1/16 15 PLACES
R 60 PLACES
1/4 15 PLACES
1/2 15 PLACES
VIEW A-A
L6
8.250 +.010 -.000 DIA
8.625 DIA
.125 ±.010
.750
.018 +.002 -.002
.076
.016 +.000 -.005
9.156 +.010 -.010 DIA
9.687 DIA
H2
-B-
◎ A .032
8.906 DIA MIN
9.800 DIA MAX
9.938 DIA MIN
10.782 DIA MAX
10.540 +.010 -.010 DIA
H1
9.562 DIA
.105
1/32 R
1/32 R
.015 R MAX
10.745 DIA
N1
10.777 DIA
H4
.016 +.000 -.005
PARTIAL SECTION E-E
SCALE 4:1

6	2	1899952-6	RING, ADAPTER OUTER	2 4
5	2	1899952-5	RING, ADAPTER INNER	2
4	1	1899952-4	BELLOWS, INNER	2
3	1	1899952-3	BELLOWS, OUTER	2
2	1	1899952-2	S/C END RING	1
1	1	1899952-1	OPTICS END RING	1
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	

LIST OF PARTS AND MATERIALS

1899952

~~FOR INFORMATION ONLY~~

~~CLASS B RELEASE~~ TDR No. 00104 DATE

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+
-1/64	-.005	-

DO NOT SCALE THIS DRAWING

MATERIAL 1 2

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 14 NOV 62
CHECKED 14 NOV 62
APPROVAL 14 Nov 62
APPROVAL 14 NOV 62
NASA APPROVAL 4/2/62
MIT APPROVAL W. Kupfer 21 NOV 62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS ASSEMBLY,
SXT

CODE IDENT NO.
SIZE J
1899952
SCALE 1:1
APPROX. WT. LB 4C2
SHEET

1899952

271899952

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL:

1▷ QQ-S-763, CL321 STAINLESS STEEL

2▷ MIL-S-6721, CL321 STAINLESS STEEL

3. REQUIREMENTS:

(A) PRIOR TO WELDING PASSIVATE IN ACCORDANCE WITH MIL-F-14072, FINISH E-300.

(B) ACID CLEANING SHALL NOT BE PERMITTED AFTER ASSEMBLY UNLESS VENT IS WELDED CLOSED.

3▷ (C) INERT HELI-ARC WELD ITEMS (3)(4)(5)(6) TO ITEM (1) AND WELD ITEMS (3)(4)(5)(6) TO ITEM (2) PER MIL-W-8611 AS SHOWN OR PER ALTERNATE ASSEMBLY METHOD.

(D) WELDING TO BE INSPECTED PER MIL-I-6866

(E) UNLESS OTHERWISE SPECIFIED:

1. ALL INSIDE AND OUTSIDE CORNERS TO BE .005-.015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS NOT TO EXCEED $\sqrt[125]{}$

(F) UNDER NO CONDITIONS, SHALL THIS ASSEMBLY BE EXPANDED, CONTRACTED OR ALLOWED RELATIVE LATERAL MOTION IN EXCESS OF $\frac{5}{16}$ INCH OF ITS FREE POSITION. THE END RINGS SHALL BE MAINTAINED PARALLEL WITHIN 1° DURING THE ABOVE MENTIONED MOVEMENTS.

(G) SPRING RATE: WITHIN THE LIMITATIONS SPECIFIED IN 3⁻ ABOVE, THE AXIAL SPRING RATES ~~AND RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 244#/IN~~ SHALL NOT EXCEED 500#/IN IN COMPRESSION AND 260#/IN TENSION. THE RADIAL (OFFSET) SPRING RATE SHALL NOT EXCEED 1150#/IN.

(J) VENDOR SHIPPING REQUIREMENTS.

BELLOWS ASSEMBLY MUST BE COMPLETELY FREE OF OIL, DIRT, CHIPS, LOOSE SCALE AND CORROSION PRODUCTS. ASSEMBLY TO BE PROTECTIVELY PACKAGED UNTIL TIME OF USAGE, IN A CLEAN NEW VAPORPROOF BAG MEETING MIL-B-117, TYPE I, CLASS C REQUIREMENTS. AN ADEQUATE AMOUNT OF DESSICANT MATERIAL SHALL BE ENCLOSED AND EVACUATION OF THE BAG PERFORMED PRIOR TO SEALING, TO INSURE LOW MOISTURE CONTENT IN THE BAG FOR AT LEAST TWELVE MONTHS. THE PROTECTIVE PACKAGE SHALL PROVIDE A METHOD OF RESTRAINING THE BELLOWS ASSEMBLY WITHIN THE LIMITATIONS OF 3 ABOVE.

(K) IDENTIFY USING DRAWING NUMBER, REVISION LETTER, *SERIAL NUMBER, AND DATE OF FILLING AND SEALING AT THE INDICATED LOCATION PER ND 1002023 (NAMEPLATE PERMISSIBLE).*

(L) BELLOWS ASSEMBLY SHALL BE CAPABLE OF USE IN AN ENVIRONMENT OF NORMAL AIR, VACUUM, NITROGEN OR 100% OXYGEN. (THE BELLOWS ASSEMBLY SHALL BE RESTRAINED WITHIN THE LIMITATION OF 3f ABOVE.)

(H5) 4▷ *(M) THIS RING IS FOR MFG. PURPOSES ONLY AND ITS USE IS OPTIONAL.*

4. THE BELLOWS ASSEMBLY SHALL BE CAPABLE OF MEETING ALL THE ABOVE REQUIREMENTS BEFORE & AFTER EXPOSURE TO EACH OF THE FOLLOWING ENVIRONMENTS:

(A) VIBRATION: COMPLEX VIBRATION CONSISTING OF SINUSOID AND RANDOM NOISE AS SPECIFIED BELOW. (IN ACTUAL USE THE BELLOWS ASSEMBLY END RING (SURFACE D) SHALL BE MOUNTED TO AN ISOLATED SYSTEM. THE RELATIVE DISPLACEMENT OF ONE END OF THE BELLOWS TO THE OTHER WILL BE ±$\frac{1}{4}$ INCH MAX. ALONG 3 MUTUALLY PERPENDICULAR AXES. THE VALUES SPECIFIED BELOW ARE THE INPUTS TO THE BELLOWS ASSEMBLY.)

SINUSOIDAL VIBRATION (SWEPT LOGARITHMICALLY FROM 5 TO 2000 TO 5 CPS IN 15 MINUTES)

FREQUENCY	AMPLITUDE
5 - 10 CPS	.30 INCH DOUBLE AMPLITUDE
10 - 20 CPS	± 1.5 G'S
20 - 63 CPS	.07 INCH DOUBLE AMPLITUDE
63 - 2000 CPS	± 16.5 G'S

RANDOM VIBRATION - SPECTRAL DENSITY OF .015 G^2 PER CPS AT 5 CPS WITH A LINEAR INCREASE TO .19 G^2 PER CPS AT 90 CPS, CONSTANT TO 220 CPS, AND A LINEAR DECREASE TO .06 G^2 PER CPS AT 2000 CPS.

(B) SHOCK - 75 G'S FOR 11 MS (TERMINAL PEAK SAWTOOTH) ALONG THE NORMAL AXES.

(C) SUBSTAINED ACCELERATION - 30 G MAXIMUM.

(D) TEMPERATURE - +300°F TO -200°F.

(E) HUMIDITY - 100% R.H. INCLUDING CONDENSATION (APPLICABLE ONLY TO THE SURFACE OF VOLUME V_2).

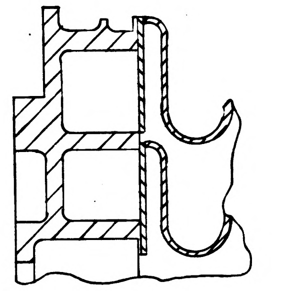
5. THESE CHECKS ARE TO BE PERFORMED JUST PRIOR TO FINAL INSPECTION.

(A) PRIOR TO SEALING OF VENT AND WITH THE BELLOWS ASSEMBLY RESTRAINED. THE MAXIMUM LEAK RATE SHALL NOT EXCEED 7×10^{-8} CC/SEC OF HELIUM AT 40 PSIA IN V_1, AND A VACUUM OF 7.5×10^{-4} mm HG EXTERNAL AND IN V_2.

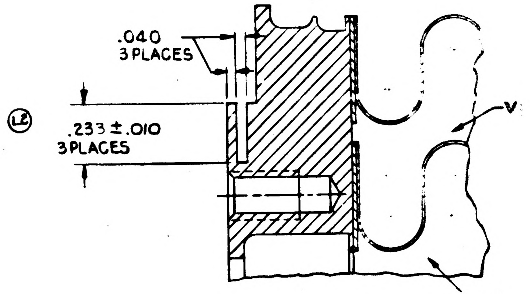
(B) EVACUATE VOLUME V_1, BACKFILL WITH 80% PREPURIFIED DRY NITROGEN (99.995%) AND 20% PURIFIED HELIUM (99.99%, 20 PARTS PER MILLION MAX. WATER, 10 PARTS PER MILLION OXYGEN MAX. BY VOLUME) TO ONE ATMOSPHERE (14.7±.5 PSIA) AT ROOM TEMPERATURE (70±5°F), AND SEAL AFTER COMPLETION OF FABRICATION.

(C) WITH THE BELLOWS SEALED AT "C" & "D", THE MAXIMUM EXTERNAL LEAK RATE SHALL NOT EXCEED 1×10^{-8} CC/SEC OF HELIUM AT 7.5 PSIA EXTERNAL PRESSURE AND A VACUUM IN V_2 OF 7.5×10^{-4} MM HG.

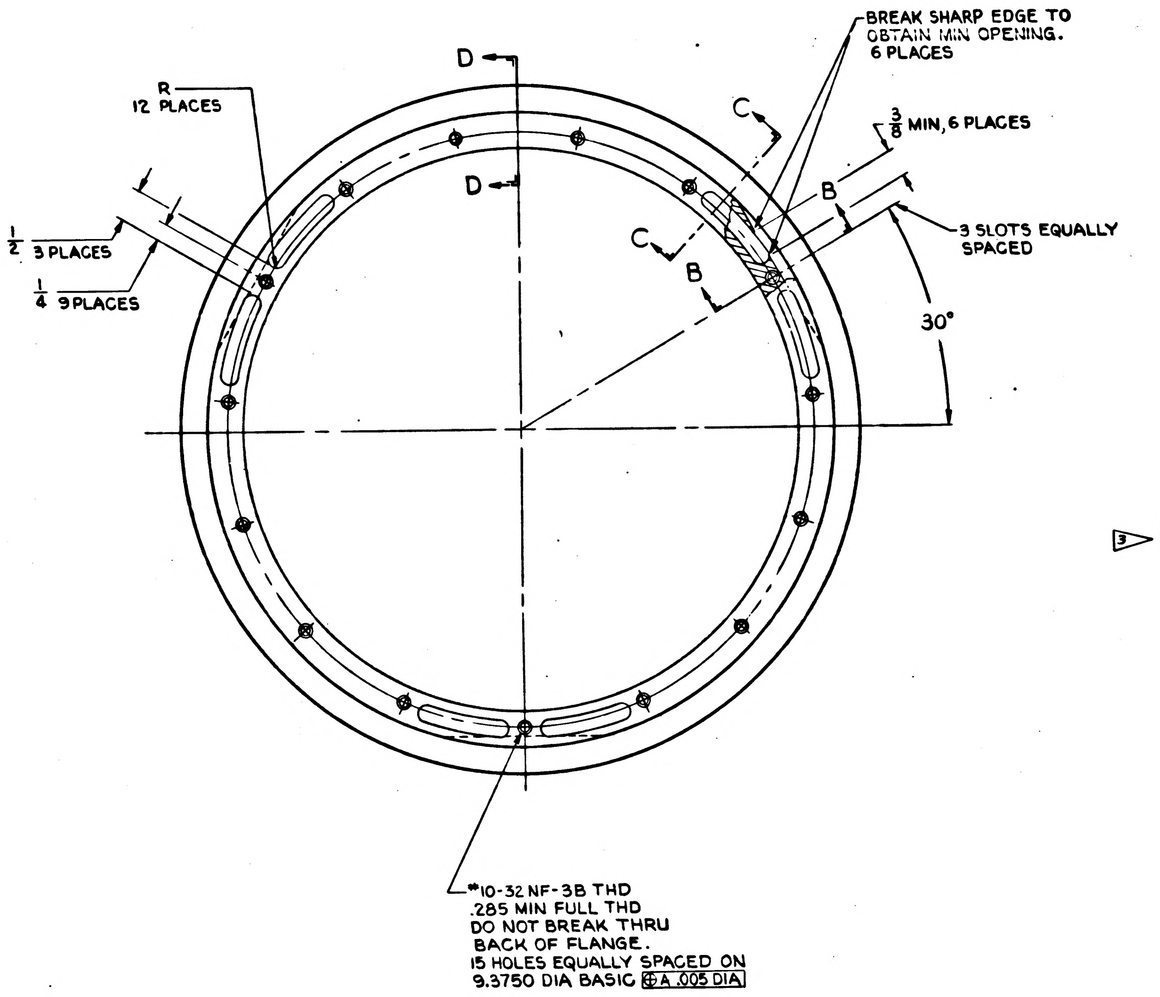
5▷ THIS DIMENSION MUST BE MET PRIOR TO WELDING. MAXIMUM DISTORTION DUE TO WELDING NOT TO EXCEED ±$\frac{1}{32}$ FROM NOMINAL DIMENSION.

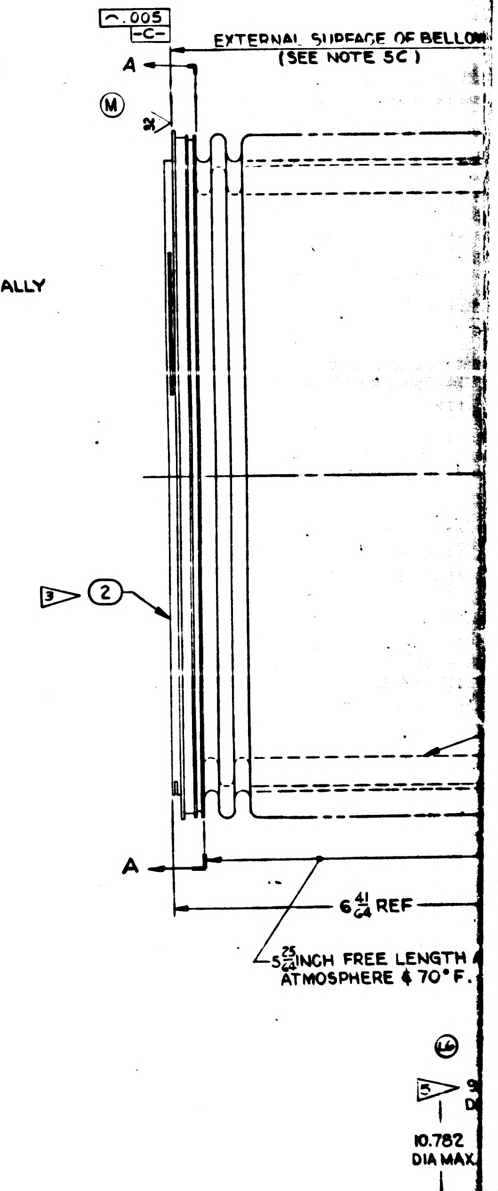


3▷ *ALTERNATE ASSEMBLY METHOD*



PARTIAL SECTION B-B
SCALE 4:1

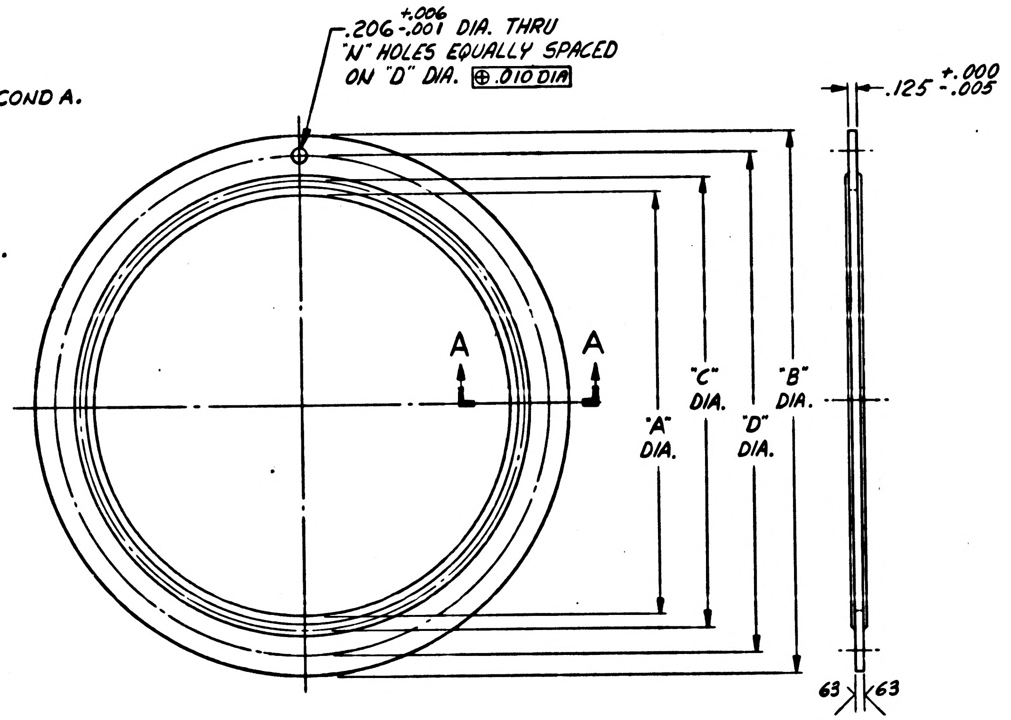


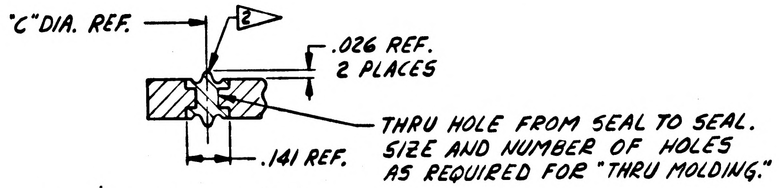


1899953 C

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C		UPGRADED FOR CLASS A RELEASE		27-APR-63	

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
2. MATERIALS: (1)
   - (a) RING - STAINLESS STEEL PER QQ-S-763 OR QQ-S-766, CL 321, COND A.
   - (b) SEAL - RUBBER, COMP. 77-545, PER MIL-R-25897 TYPE I, CLASS I.
3. REQUIREMENTS:
   - (a) STEEL RING - PASSIVATE PER MIL-F-14072, (SIG C), FINISH E-300.
   - (2) (b) SEAL CONFIGURATION SHALL BE SUCH THAT 92%-100% FILL OF GLAND IS OBTAINED IN SEALED POSITION.
4. UNLESS OTHERWISE SPECIFIED:
   - (a) ALL CORNERS TO BE .005 TO .015 RADIUS OR CHAMFER.
   - (b) MUST BE FREE FROM BURRS.
   - (c) SURFACE ROUGHNESS NOT TO EXCEED 125✓
5. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.
6. PACKAGE IN ACCORDANCE WITH MIL-B-121 B, TYPE 2.


.206 +.006 -.001 DIA. THRU
"N" HOLES EQUALLY SPACED
ON "D" DIA. ⊕ .010 DIA
.125 +.000 -.005
A
A
"A" DIA.
"C" DIA.
"D" DIA.
"B" DIA.
63
63


"C" DIA. REF.
2
.026 REF.
2 PLACES
.141 REF.
THRU HOLE FROM SEAL TO SEAL.
SIZE AND NUMBER OF HOLES
AS REQUIRED FOR "THRU MOLDING."

PARTIAL SECTION A-A

PART NUMBER	"A"	"B"	"C"	"D"	"N"
1899953-001	5.250 +.010 -.010	6.750 +.010 -.010	5.625 +.010 -.010	6.250	9 HOLES
1899953-002	9.250 +.010 -.010	10.750 +.010 -.010	9.625 +.010 -.010	10.250	15 HOLES

00184
12-19-62

12-19-62

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.005	+ —
— —	-.005	— —

DO NOT SCALE THIS DRAWING
MATERIAL (1)
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. SOMMER DATE 14 NOV 62
CHECKED 20 Nov 62
APPROVAL J. A. 20 NOV 62
APPROVAL A.J. KODEL 20 Nov 62
NASA APPROVAL W.J. Rhine 12-19-62
MIT APPROVAL 14 Dec 1962

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SEAL, BELLOWS

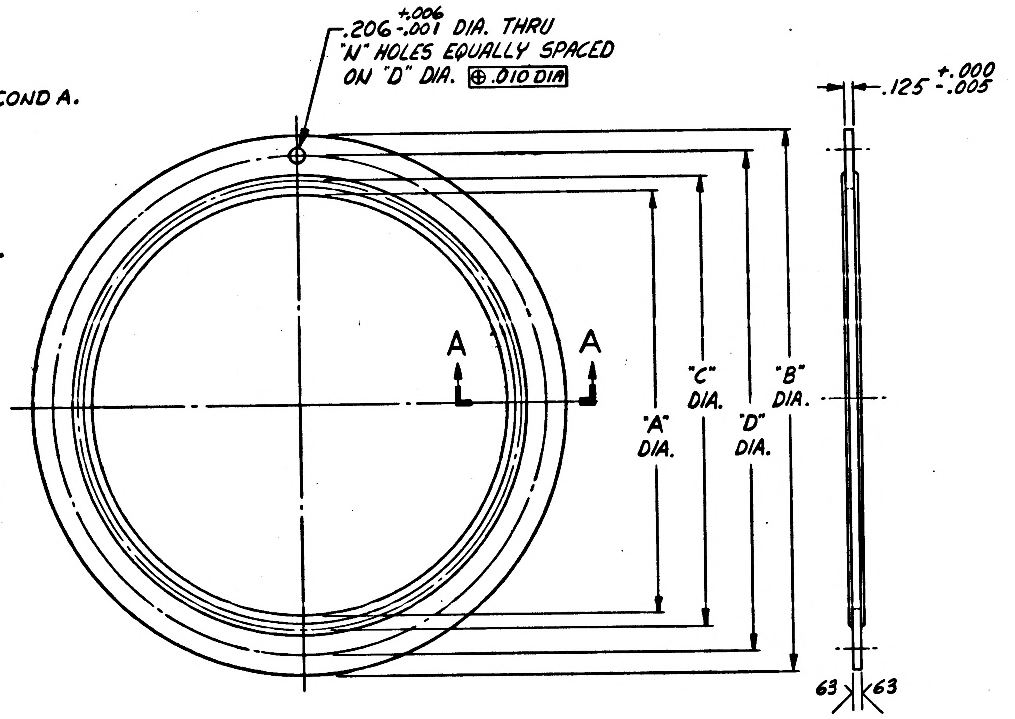
CODE IDENT NO.
SIZE D
1899953
SCALE N.T.S.
SHEET

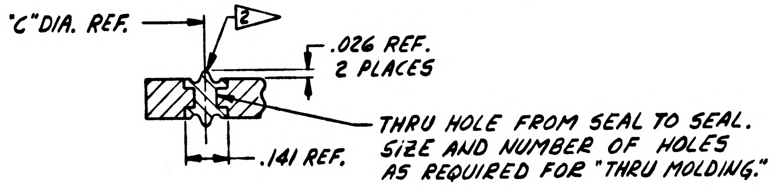
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1899953 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
REVISIONS					
C		UPGRADED FOR CLASS A RELEASE TDRR 01077		27-APR-63	AJF
D		REVISED PER TDRR NO. 03673		21 OCT 63	WK

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
2. MATERIALS: ▷1
   - (a) RING - STAINLESS STEEL PER QQ-S-763 OR QQ-S-766, CL 321, COND A.
   - (b) SEAL - RUBBER, COMP. 77-545, PER MIL-R-25897 TYPE I, CLASS I.
3. REQUIREMENTS:
   - (a) STEEL RING - PASSIVATE PER MIL-F-14072, (S16 C), FINISH E-300.
   - ▷2 (b) SEAL CONFIGURATION SHALL BE SUCH THAT 92%-100% FILL OF GLAND IS OBTAINED IN SEALED POSITION.
4. UNLESS OTHERWISE SPECIFIED:
   - (a) ALL CORNERS TO BE .005 TO .015 RADIUS OR CHAMFER.
   - (b) MUST BE FREE FROM BURRS.
   - (c) SURFACE ROUGHNESS NOT TO EXCEED 125✓
5. IDENTIFY USING DRAWING NUMBER, APPLICABLE DASH NUMBER, REVISION LETTER, CURING DATE, AND SERIAL NUMBER PER ND 1002023.
6. PACKAGE IN ACCORDANCE WITH MIL-B-121 B, TYPE 2.


.206 +.006 -.001 DIA. THRU
"N" HOLES EQUALLY SPACED
ON "D" DIA. ⊕ .010 DIA
.125 +.000 -.005
A
A
"A" DIA.
"C" DIA.
"D" DIA.
"B" DIA.
63
63


"C" DIA. REF.
2
.026 REF.
2 PLACES
THRU HOLE FROM SEAL TO SEAL.
SIZE AND NUMBER OF HOLES
AS REQUIRED FOR "THRU MOLDING."
.141 REF.

PARTIAL SECTION A-A

PART NUMBER	"A"	"B"	"C"	"D"	"N"
1899953-001	5.250 $^{+.010}_{-.010}$	6.750 $^{+.010}_{-.010}$	5.625 $^{+.010}_{-.010}$	6.250	9 HOLES
1899953-002	9.250 $^{+.010}_{-.010}$	10.750 $^{+.010}_{-.010}$	9.625 $^{+.010}_{-.010}$	10.250	15 HOLES

00184
12-19-62

12-19-62

NEXT ASSY	USED ON
1899950-011	1899950-011
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — —
DECIMALS +.005 -.005
ANGLES + — — —
DO NOT SCALE THIS DRAWING
MATERIAL ▷1
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. SOMMER DATE 14 NOV 62
CHECKED E. L. Hintz 20 Nov 62
APPROVAL J. A. [illegible] 20 NOV 62
APPROVAL A. J. KODEL L.C. 20 Nov 62
NASA APPROVAL W. J. Rhine 12-19-62
R. Bras
MIT APPROVAL W. Kupfer 19 Dec 1962

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SEAL, BELLOWS

CODE IDENT NO.
SIZE D
1899953
SCALE N.T.S.
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1899954

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS A RELEASE		27-APR-63	J.F.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

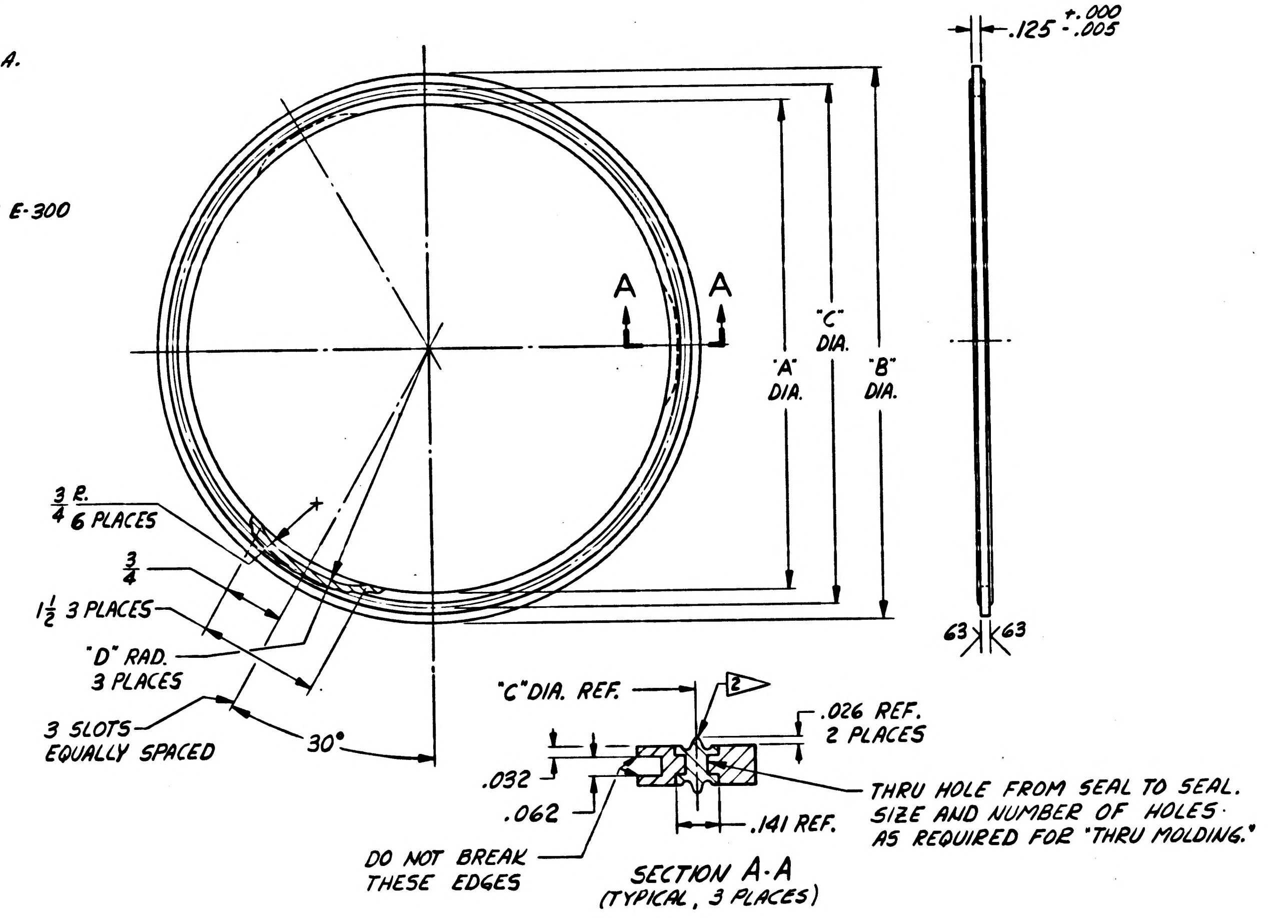
▷1 2. MATERIALS:
   (a) RING - STAINLESS STEEL PER QQ-S-763 OR QQ-S-766, CLASS 321, COND A.
   (b) SEAL - RUBBER COMP 77-545, PER MIL-R-25897, TYPE 1, CLASS 1.

3. REQUIREMENTS:
   (a) STEEL RING - PASSIVATE PER MIL-F-14072, (SIG. C), FINISH E-300
   ▷2 (b) SEAL CONFIGURATION SHALL BE SUCH THAT 92% - 100% FILL OF GLAND IS OBTAINED IN SEALED POSITION.

4. UNLESS OTHERWISE SPECIFIED:
   (a) ALL CORNERS TO BE .005 TO .015 RADIUS OR CHAMFER.
   (b) MUST BE FREE FROM BURRS.
   (c) SURFACE ROUGHNESS NOT TO EXCEED 125√

5. IDENTIFY USING DRAWING NUMBER, APPLICABLE DASH NUMBER AND REVISION LETTER PER MIL-STD-130.

6. PACKAGE IN ACCORDANCE WITH MIL-B-121B, TYPE 2.



$.125^{+.000}_{-.005}$
A
A
"C" DIA.
"A" DIA.
"B" DIA.
63
63
$\frac{3}{4}$ R. 6 PLACES
$\frac{3}{4}$
$1\frac{1}{2}$ 3 PLACES
"D" RAD. 3 PLACES
3 SLOTS EQUALLY SPACED
30°
"C" DIA. REF.
2
.026 REF. 2 PLACES
.032
.062
.141 REF.
THRU HOLE FROM SEAL TO SEAL. SIZE AND NUMBER OF HOLES AS REQUIRED FOR "THRU MOLDING."
DO NOT BREAK THESE EDGES

SECTION A-A
(TYPICAL, 3 PLACES)

PART NUMBER	"A"	"B"	"C"	"D"
1899954-001	$6.125^{+.010}_{-.010}$	$6.843^{+.010}_{-.010}$	$6.500^{+.010}_{-.010}$	$3.140^{+.010}_{-.010}$
1899954-002	$10.125^{+.010}_{-.010}$	$10.843^{+.010}_{-.010}$	$10.500^{+.010}_{-.010}$	$5.140^{+.010}_{-.010}$

00184 12-19-62

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$\pm\frac{1}{64}$	$\pm .005$	± —

DO NOT SCALE THIS DRAWING

MATERIAL ▷1

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. SOMMER DATE 14 NOV 62
CHECKED 20 Nov 62
APPROVAL 20 Nov 62
APPROVAL A. J. KODEL L.C. 20 NOV 62
NASA APPROVAL W J Rhine 12-19-62
MIT APPROVAL 9 Dec 1962

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SEAL, BELLOWS

CODE IDENT NO.
SIZE D 1899954
SCALE N.T.S.
SHEET

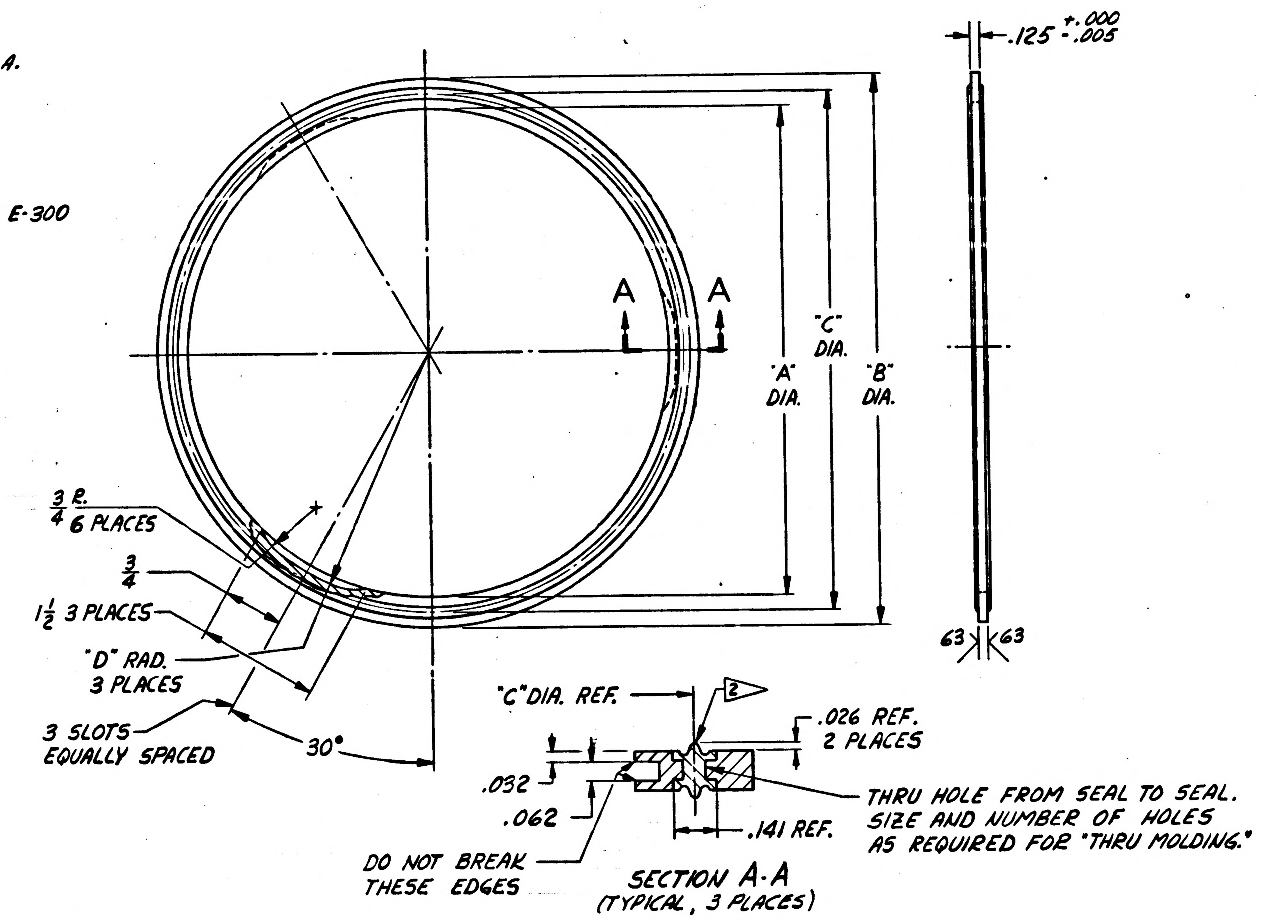
INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1899954 E

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS A RELEASE TDRR 01078		27-APR-63	A.J.F.
E		REVISED PER TDRR NO. 03673			WH

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. ▷1 MATERIALS:
   (a) RING - STAINLESS STEEL PER QQ-S-763 OR QQ-S-766, CLASS 321, COND A.
   (b) SEAL - RUBBER COMP 77-545, PER MIL-R-25897, TYPE 1, CLASS 1.
3. REQUIREMENTS:
   (a) STEEL RING - PASSIVATE PER MIL-F-14072, (SIG. C), FINISH E-300
   (b) ▷2 SEAL CONFIGURATION SHALL BE SUCH THAT 92% - 100% FILL OF GLAND IS OBTAINED IN SEALED POSITION.
4. UNLESS OTHERWISE SPECIFIED:
   (a) ALL CORNERS TO BE .005 TO .015 RADIUS OR CHAMFER.
   (b) MUST BE FREE FROM BURRS.
   (c) SURFACE ROUGHNESS NOT TO EXCEED 125/
5. IDENTIFY USING DRAWING NUMBER, APPLICABLE DASH NUMBER, REVISION LETTER, CURING DATE, AND SERIAL NO. PER ND 1002023.
6. PACKAGE IN ACCORDANCE WITH MIL-B-121B, TYPE 2.



.125 +.000 -.005
A
A
"C" DIA.
"A" DIA.
"B" DIA.
3/4 R. 6 PLACES
3/4
1 1/2 3 PLACES
"D" RAD. 3 PLACES
3 SLOTS EQUALLY SPACED
30°
63
63
"C" DIA. REF.
2
.026 REF. 2 PLACES
.032
.062
.141 REF.
THRU HOLE FROM SEAL TO SEAL. SIZE AND NUMBER OF HOLES AS REQUIRED FOR "THRU MOLDING."
DO NOT BREAK THESE EDGES
SECTION A-A (TYPICAL, 3 PLACES)

PART NUMBER	"A"	"B"	"C"	"D"
1899954-001	$6.125^{+.010}_{-.010}$	$6.843^{+.010}_{-.010}$	$6.500^{+.010}_{-.010}$	$3.140^{+.010}_{-.010}$
1899954-002	$10.125^{+.010}_{-.010}$	$10.843^{+.010}_{-.010}$	$10.500^{+.010}_{-.010}$	$5.140^{+.010}_{-.010}$

00184 12-19-62

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS $\pm\frac{1}{64}$ DECIMALS $\pm.005$ ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL ▷1
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. SOMMER DATE 14 NOV 62
CHECKED 20 Nov 62
APPROVAL J. A. Stamm 20 Nov 62
APPROVAL A. J. KOOEL L.C. 20 NOV 62
NASA APPROVAL W J Rhine 12-19-62
MIT APPROVAL 19 Dec 1962

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

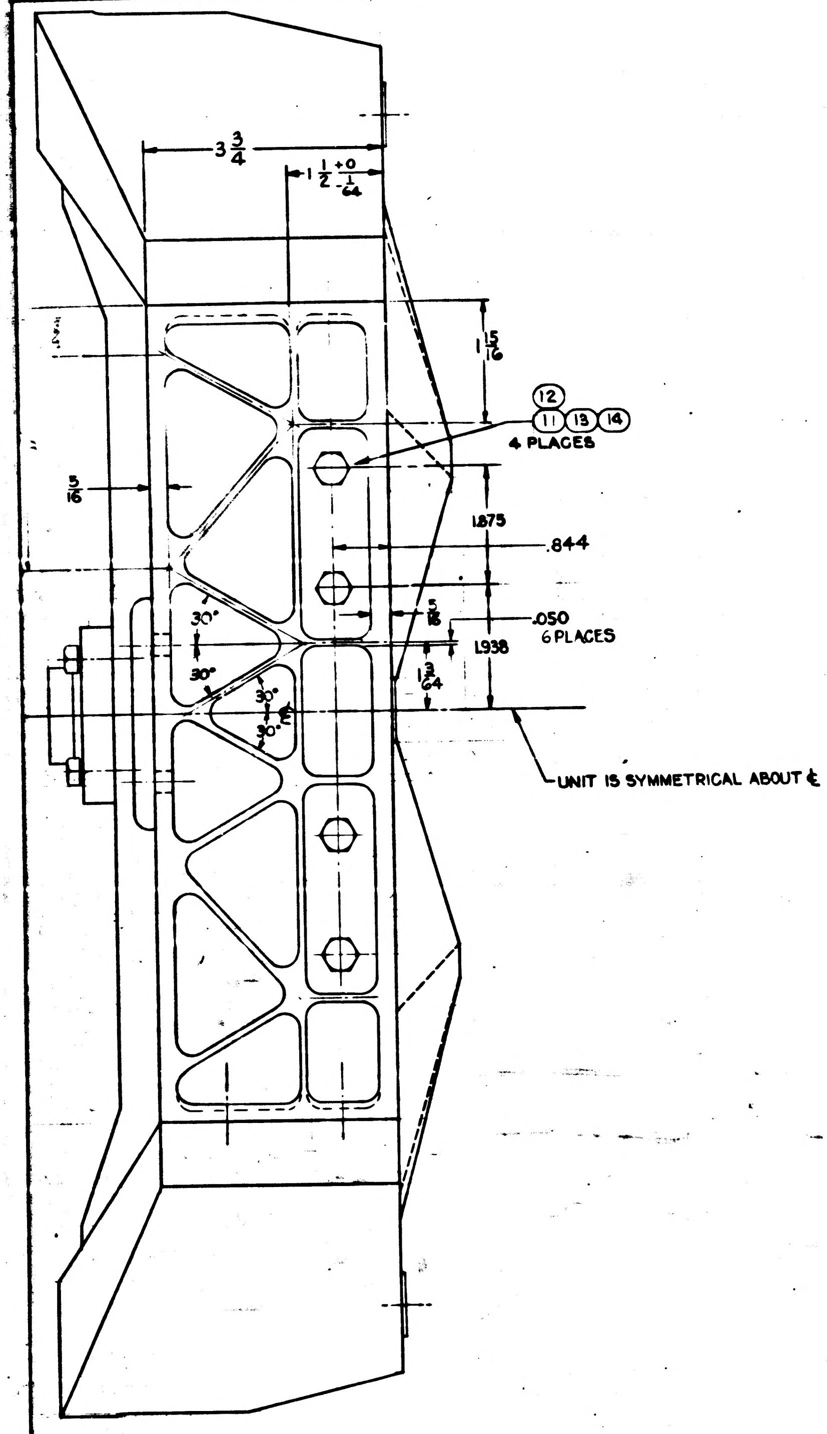
SEAL, BELLOWS

CODE IDENT NO.
SIZE D
1899954
SCALE N.T.S.
SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

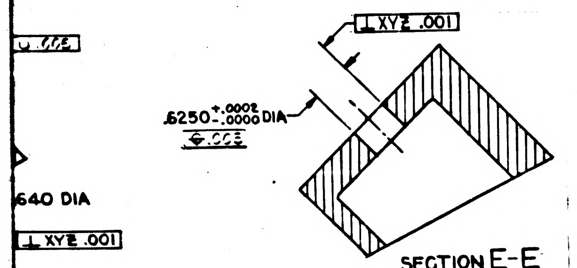
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A1		Ⓐ REVISED IN ACCORDANCE WITH MXC 200001	MXC 200001	4 JAN 63	L.C. / J.C.
B1		Ⓑ REVISED IN ACCORDANCE WITH MXC 200006	MXC 200006	15 JAN 63	
C1		Ⓒ REVISED IN ACCORDANCE WITH MXC 200051	MXC 200051	18 MAR 63	WF
D1		Ⓓ REVISED IN ACCORDANCE WITH MXC 200067	MXC 200067	27 MAR 63	WF
E1		Ⓔ REVISED IN ACCORDANCE WITH MXC 200070 TDRR00696	MXC 200070	27 MAR 63	WF

ALL ON TDRR 00696



FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00167 DATE 12 DEC '62

17	2	MS 35308-009	SCREW-HEX HD
16	2	MS 21209-F4-15	HELI-COIL-SELF LOCKING 1/4-28UNF
15	1	MS 21209-F4-20	HELI-COIL-SELF LOCKING 1/4-28UNF
14	27	MS 35690-430	NUT-PLAIN HEX
13	27	MS 35338-082	WASHER-SPLIT LOCK
12	27	AN-960C416	WASHER-PLAIN
11	25	MS-35308-008	SCREW-HEX HD
10	3	-010	PAD-REFERENCE
9	1	-009	OPTICS SUPPORT-REAR
8	1	-008	IMU SUPPORT-RH REAR
7	1	-007	-LH REAR
6	1	-006	-RH FRONT
5	1	-005	-LH FRONT
4	1	-004	BRIDGE-BACK
3	1	-003	BRIDGE-FRONT
2	1	-002	ARM-RH
1	1	1899955-001	ARM-LH
ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		LIST OF PARTS AND MATERIALS	



SECTION E-E
ZONES D-6, G-8

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT

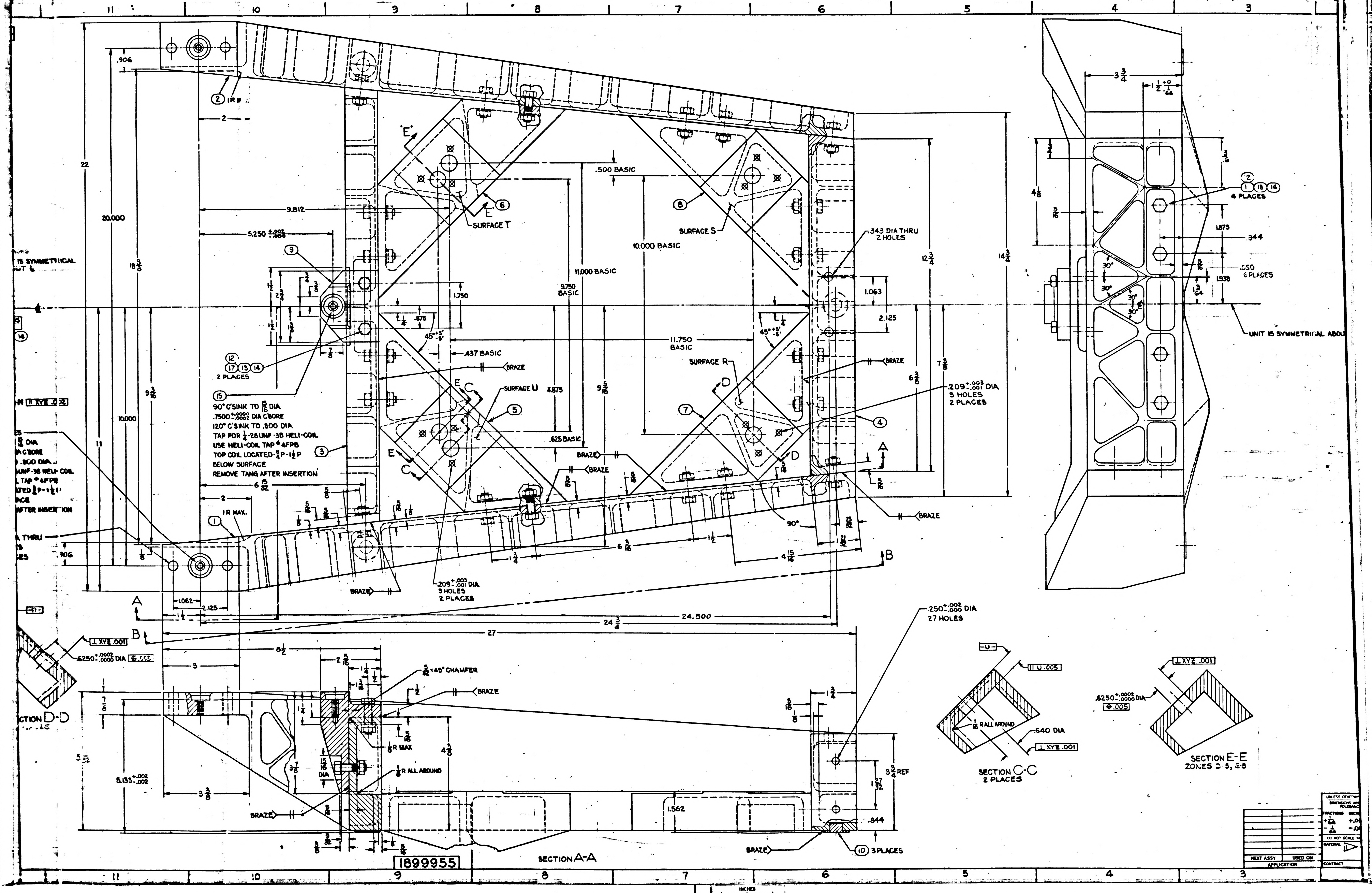
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER DATE 27 NOV 62
CHECKED 4 DEC 62
APPROVAL J. A. Hmm 4 DEC 62
APPROVAL 4 DEC 62
NASA APPROVAL 12-12-62
MIT APPROVAL 12/Dec/62

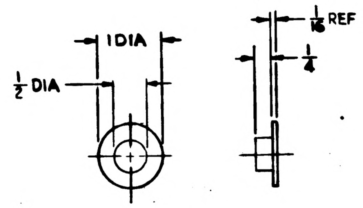
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY.-
NAVIGATION BASE
(INSEP)

CODE IDENT NO.
SIZE J3
1899955
SCALE 1:1
SHEET

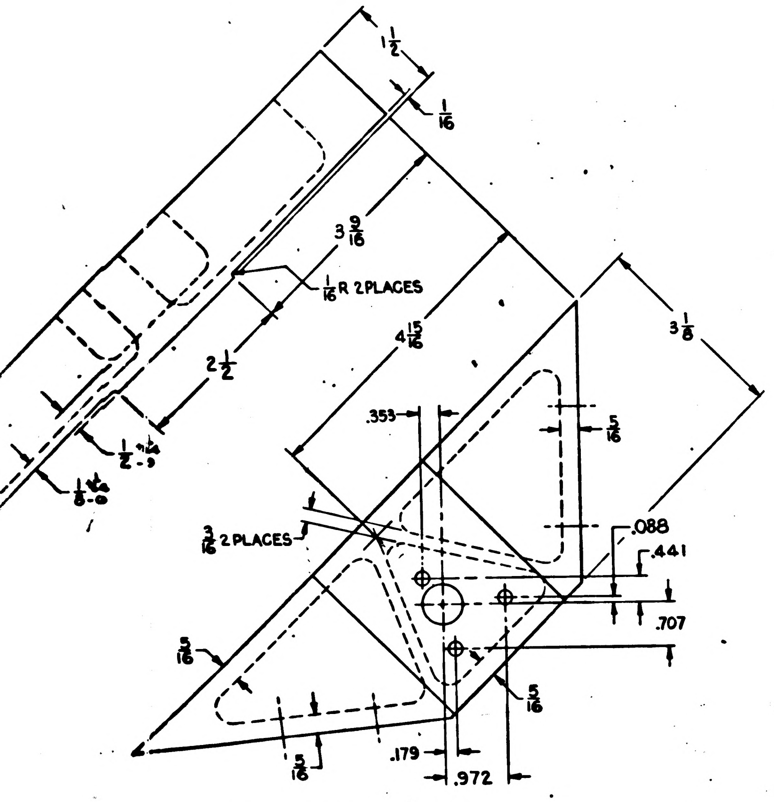
1899955

11
10
9
8
7
6
5
4
3
22
20.000
18 3/8
10.000
11
9 3/16
.966
2
IR
.906
1.062
2.125
1 1/2
9.812
5.250 +.002 -.000
1 1/2
2 3/4
3/4
3/8
1 1/2
1 3/8
7/8
1.750
1/4
.875
45° +5' -5'
.437 BASIC
4.875
9 5/16
.625 BASIC
9.750 BASIC
11.000 BASIC
.500 BASIC
10.000 BASIC
11.750 BASIC
SURFACE T
SURFACE S
SURFACE R
SURFACE U
E
C
D
BRAZE
.343 DIA THRU 2 HOLES
1.063
2.125
12 3/4
14 3/4
6 3/8
7 3/8
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
90°
1 3/32
21/32
23/32
4 15/16
6 3/16
1 1/2
1 3/4
A
B
24.500
24 3/4
27
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(12) (17) (13) (14) 2 PLACES
(15)
90° C'SINK TO 15/16 DIA
.7500 +.0000 -.0002 DIA C'BORE
120° C'SINK TO .300 DIA
TAP FOR 1/4-28UNF-3B HELI-COIL
USE HELI-COIL TAP # 4FPB
TOP COIL LOCATED-3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION
6 15/32
IR MAX.
5/8
5/16
1/8
IS SYMMETRICAL
UT 6
DIA
C'BORE
.300 DIA
UNF-3B HELI COIL
TAP # 4FPB
ATED 3/4P-1 1/2P
ACE
AFTER INSERTION
A THRU
ES
3 3/4
1 1/2 +0 -1/64
4 1/8
5/16
1/2
1.875
.344
.050 6 PLACES
1.938
1 3/64
30°
(2) (1) (13) (14) 4 PLACES
UNIT IS SYMMETRICAL ABOU
⊥ XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
SECTION D-D
3
8 1/2
2 5/16
1 1/4
1/2
1 3/16
5/32 x45° CHAMFER
7/8
5 3/32
5.133 +.002 -.002
3 7/8
3 3/8
15/16 DIA
1/8 R MAX
1/8 R ALL AROUND
4 3/8
5/16
1/8
3/8
1.562
1 27/32
3 3/4 REF
.844
(10) 3 PLACES
.250 +.002 -.000 DIA 27 HOLES
SECTION A-A
1899955
U
// U .005
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA ⊕ .005
SECTION E-E ZONES D-3, G-3
NEXT ASSY
USED ON
APPLICATION
UNLESS OTHERWIS
DIMENSIONS AR
TOLERANC
FRACTIONS
DECIM
+1/64
-1/64
+.0
-.0
DO NOT SCALE TH
MATERIAL
CONTRACT
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY



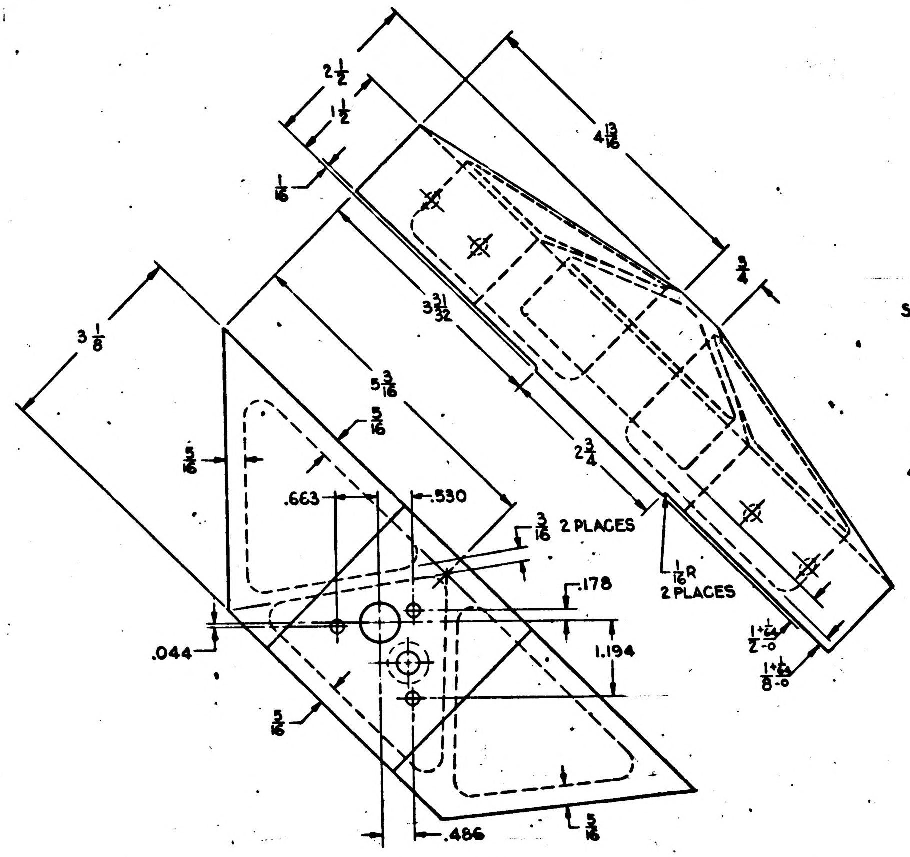
1 DIA
1/2 DIA
1/16 REF
1/4

DETAIL OF ITEM 10



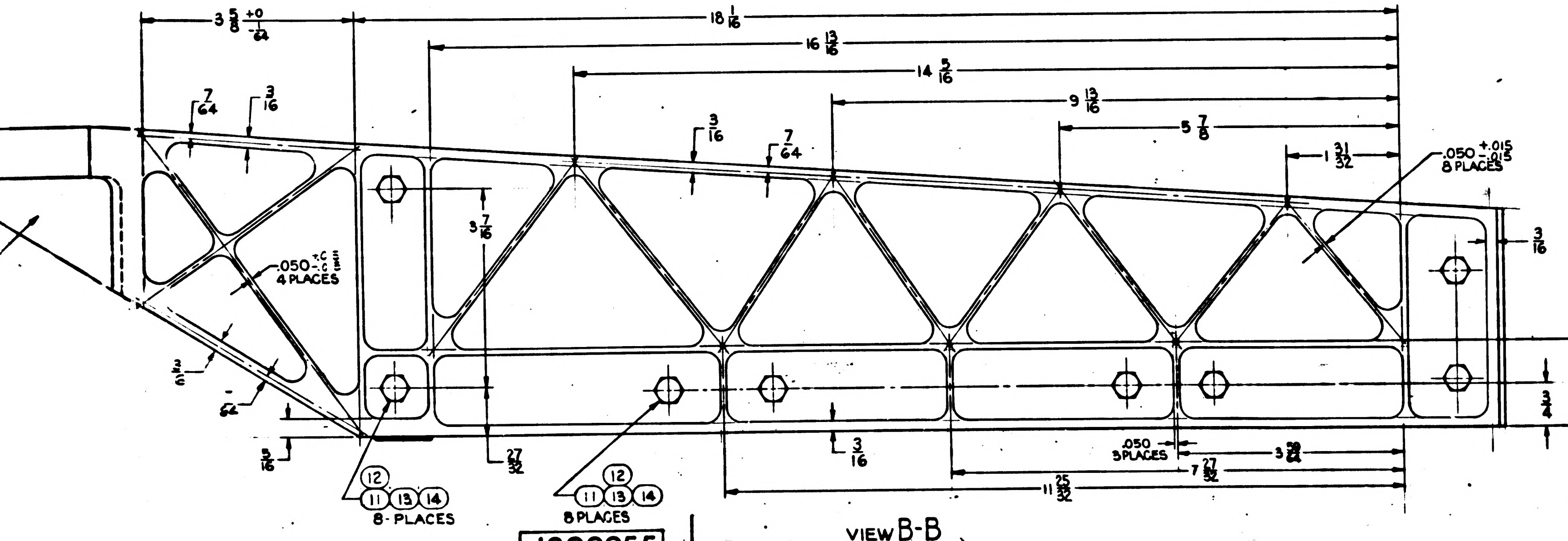
1 1/2
1/16
3 9/16
1/16 R 2 PLACES
2 1/2
4 15/16
3 1/8
.353
5/16
3/16 2 PLACES
.088
.441
.707
5/16
5/16
.179
.972

DETAIL OF ITEM 7



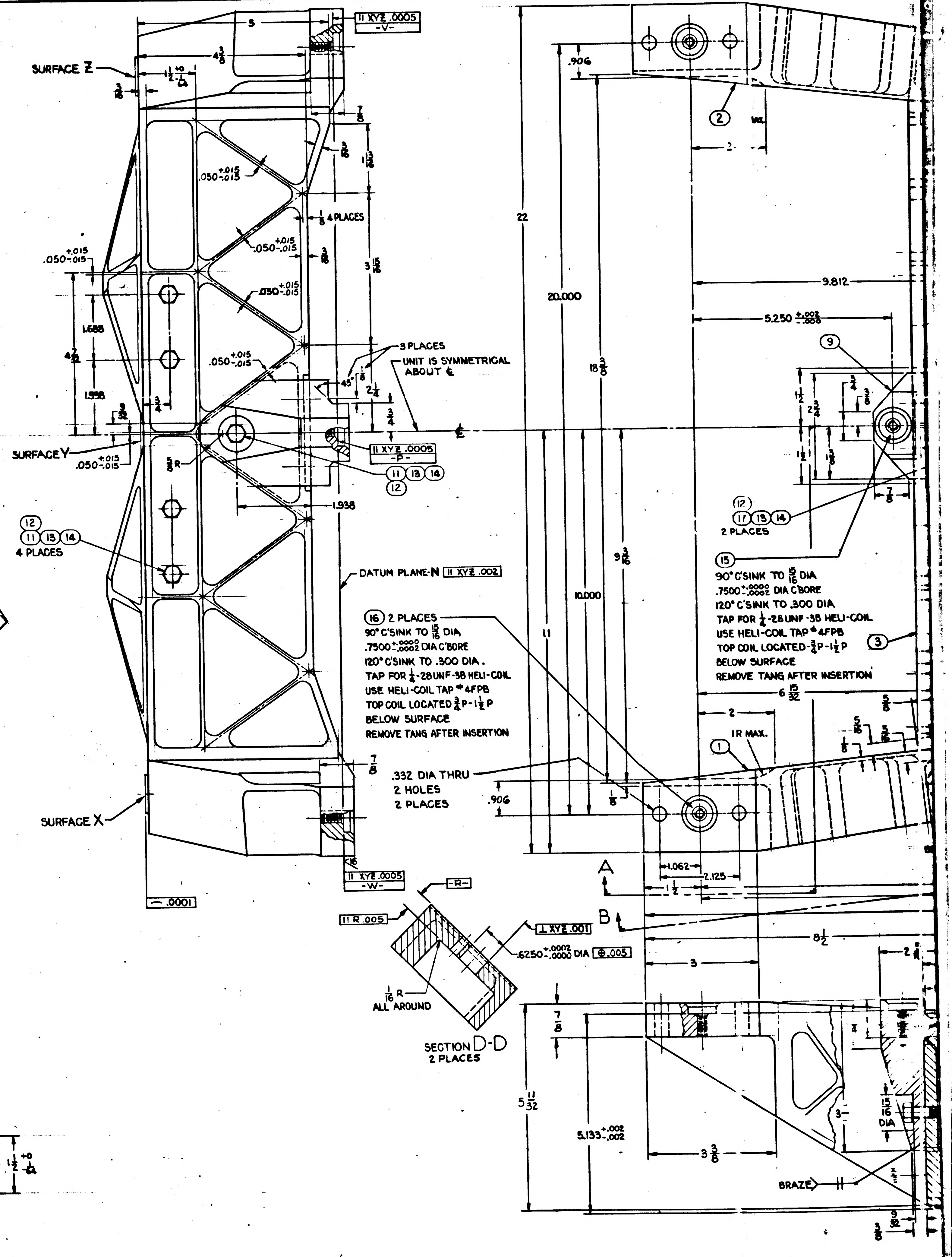
2 1/2
1 1/2
4 13/16
1/16
3 31/32
3/4
3 1/8
5 3/16
5/16
2 3/4
5/16
.663
.530
3/16 2 PLACES
1/16 R 2 PLACES
.178
1.194
.044
5/16
.486
5/16

DETAIL OF ITEM 5·



3 5/8 +0 -1/64
18 1/16
16 13/16
14 5/16
9 13/16
5 7/8
1 31/32
7/64
3/16
3/16
7/64
.050 +.015 -.015 8 PLACES
3 7/16
.050 4 PLACES
3/16
1 1/2 +0 -1/64
3/4
3/16
27/32
.050 3 PLACES
7 27/32
3 59/64
11 25/32
12 11 13 14 8 PLACES
12 11 13 14 8 PLACES
5/16

VIEW B-B



5
11 XYZ .0005 -V-
SURFACE Z
4 3/8
1 1/2 +0 -1/64
3/16
7/8
3/16
1 13/16
.050 +.015 -.015
1/8 4 PLACES
3/16
3 15/16
.050 +.015 -.015
.050 +.015 -.015
3 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
45°
1/8
2 1/4
3/4
1.688
4 1/2
1.938
SURFACE Y
.050 +.015 -.015
5/8 R
11 XYZ .0005 -P-
11 13 14 12
1.938
12 11 13 14 4 PLACES
DATUM PLANE-N 11 XYZ .002
16 2 PLACES
90° C'SINK TO 15/16 DIA
.7500 +.0000 -.0002 DIA C'BORE
120° C'SINK TO .300 DIA.
TAP FOR 1/2-28UNF-3B HELI-COIL
USE HELI-COIL TAP # 4FPB
TOP COIL LOCATED 3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION
7/8
.332 DIA THRU 2 HOLES 2 PLACES
SURFACE X
11 XYZ .0005 -W-
.0001
22
.906
2
20.000
18 3/8
10.000
11
9 3/16
9.812
5.250 +.002 -.000
9
3/4
3/8
1 1/2
2 3/4
1 1/2
1 3/8
7/8
12 17 13 14 2 PLACES
15
90° C'SINK TO 15/16 DIA
.7500 +.0000 -.0002 DIA C'BORE
120° C'SINK TO .300 DIA
TAP FOR 1/2-28UNF-3B HELI-COIL
USE HELI-COIL TAP # 4FPB
TOP COIL LOCATED 3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION
3
6 13/32
2
1R MAX.
1
5/8
1/8
.906
1/8
1.062
2.125
1 1/2
A
B
8 1/2
3
-R-
11 R .005
1 XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
1/16 R ALL AROUND
SECTION D-D 2 PLACES
7/8
5 11/32
5.133 +.002 -.002
3 3/8
15/16 DIA
BRAZE
9/32
3/8

1899955

INCHES
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH ~~MIL-D-~~70327

1 2. MATERIAL:
   - a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531
   - b. REFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 321, ½ HARD.
   - C. BRAZE MATERIAL - SILVER-LITHIUM PER ND 1002021.

3. REQUIREMENTS:
   - a. UNLESS OTHERWISE SPECIFIED:
     - 1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
     - 2. SURFACE ROUGHNESS SHALL NOT EXCEED 63/AA.
     - 3. ALL FILLETS ¼ R
     - 4. ALL WEB THICKNESS TO BE .100
     - 5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F
   - C. FURNACE BRAZE PER ND 1002020.

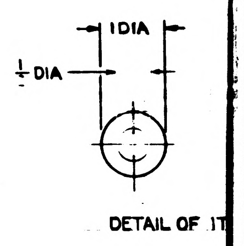
2 d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 IN. LBS.

e. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.

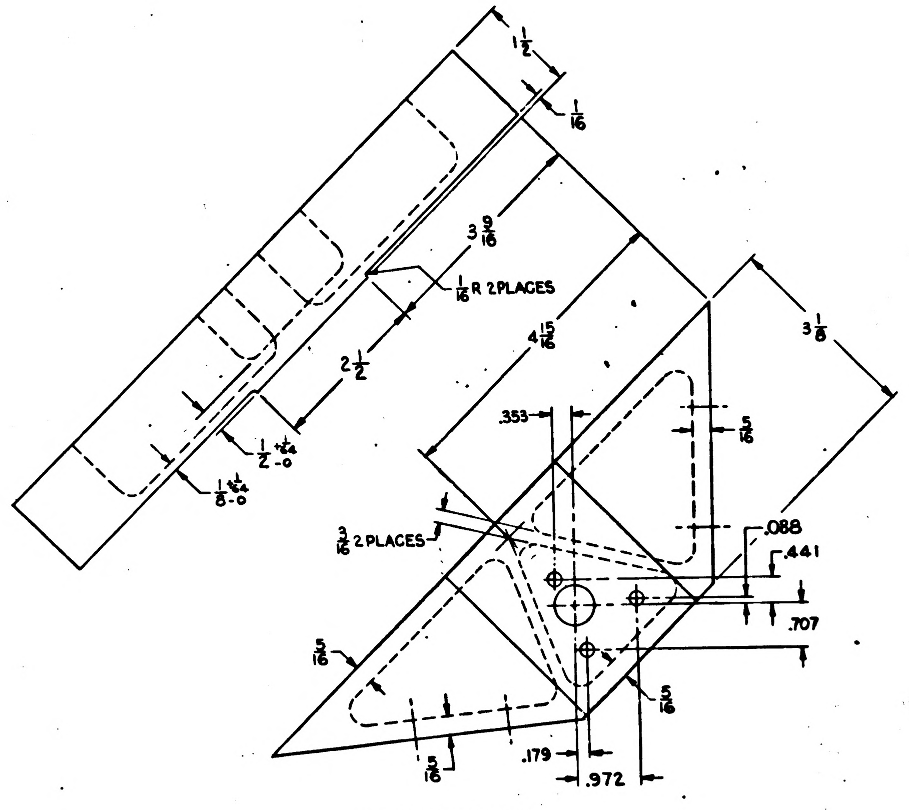
f. SURFACES RST & U TO BE 32/AA

g. PRIOR TO ANY MACHINING & AFTER BRAZING, STABILIZE PER ND 1002022.

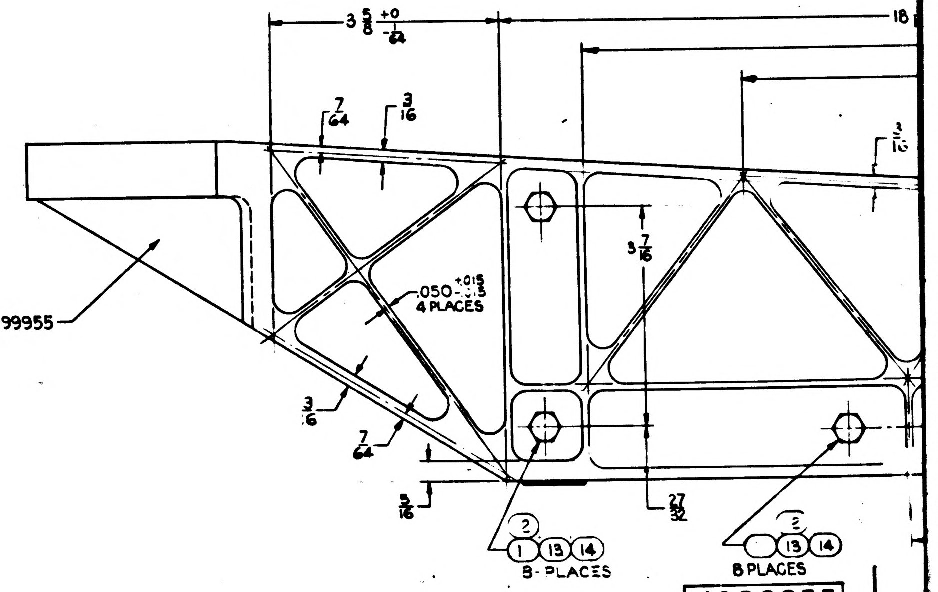
h. DATUM PLANE-N IS DEFINED BY THE HIGH POINTS OF SURFACES P V W.



DETAIL OF IT


1 1/2
1/16
3 9/16
1/16 R 2 PLACES
3 1/8
4 15/16
2 1/2
.353
5/16
1/2 +1/64 -0
1 1/8 +1/64 -0
3/16 2 PLACES
.088
.441
.707
5/16
5/16
5/16
.179
.972

DETAIL OF ITEM 7

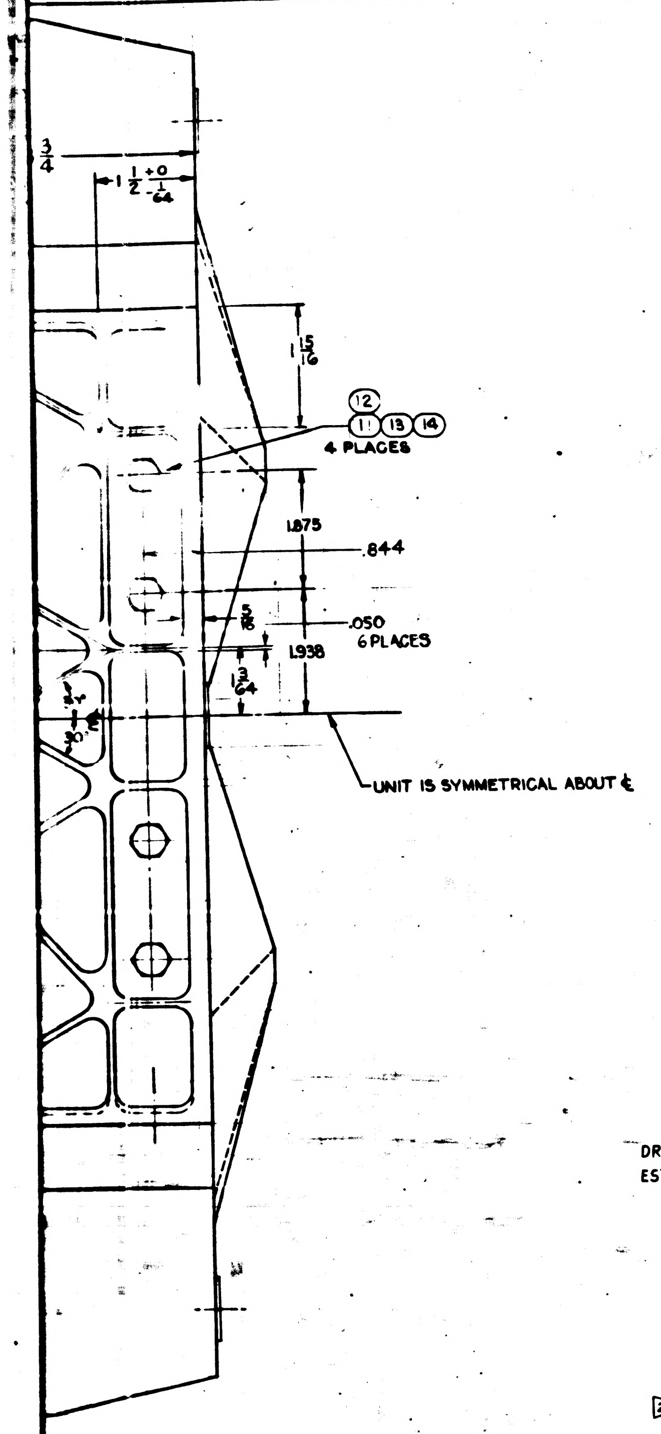

3 5/8 +0 -1/64
18
7/64
3/16
3/16
.050 +.015 -.015 4 PLACES
3 7/16
3/16
7/64
5/16
27/32
2
1 13 14
8 PLACES
2
13 14
8 PLACES

STENCIL PIECEMARK 1899955 PER MIL-STD-130

1899955

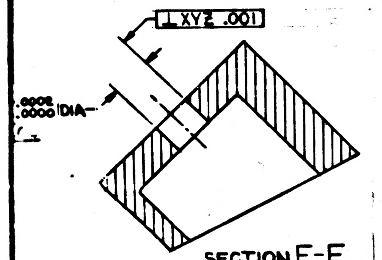
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR TDRR01093 CLASS A RELEASE		27 APR 63	LS

Ⓜ



TDR No. 00 167 DATE 12 DEC '62

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.



SECTION E-E
ZONES D-F, G8

ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	2	MS 35308-009	SCREW-HEX HD
16	2	MS 21209-F4-15	INSERT - SELF LOCKING ¼-28UNF
15	1	MS 21209-F4-20	INSERT - SELF LOCKING ¼-28UNF
14	27	MS 35690-430	NUT-PLAIN HEX
13	27	MS 35338-082	WASHER-SPLIT LOCK
12	27	AN-960C416	WASHER-PLAIN
11	25	MS-35308-008	SCREW-HEX HD
10	3	-010	PAD-REFERENCE
9	1	-009	OPTICS SUPPORT-REAR
8	1	-008	IMU SUPPORT-RH REAR
7	1	-007	-LH REAR
6	1	-006	-RH FRONT
5	1	-005	-LH FRONT
4	1	-004	BRIDGE-BACK
3	1	-003	BRIDGE-FRONT
2	1	-002	ARM-RH
1	1	1899955-001	ARM-LH

LIST OF PARTS AND MATERIALS

2▷ (item 13)

1899955

MASTER

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± 1°
DO NOT SCALE THIS DRAWING
MATERIAL ▷1
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER 27 NOV 62
CHECKED 4 DEC 62
APPROVAL J. A. Hoover 4 DEC 62
APPROVAL 4 DEC 62
NASA APPROVAL W. J. Blair 12-2-62
MIT APPROVAL 12/Dec/62

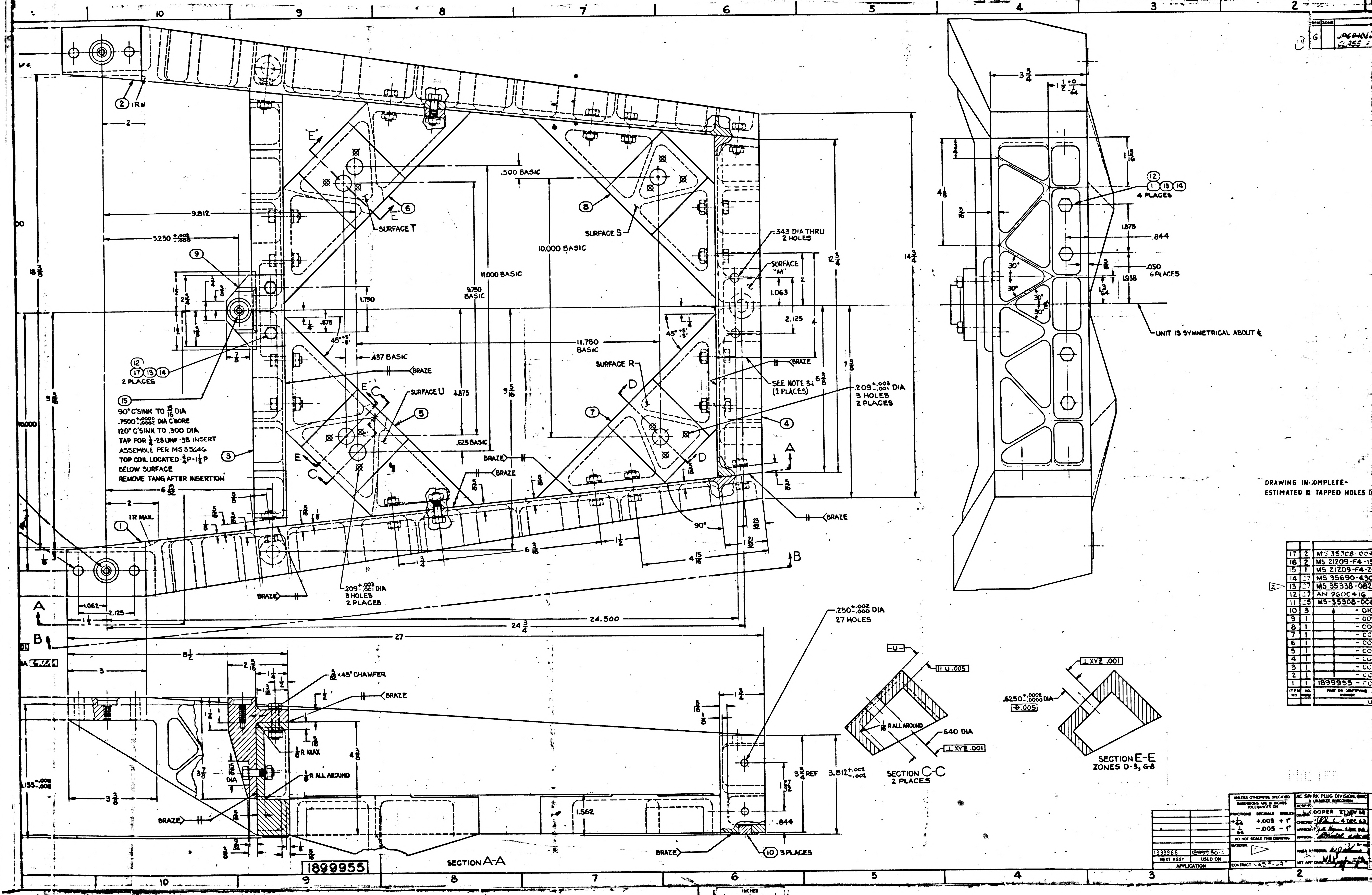
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY. -
NAVIGATION BASE
(INSEP)

CODE IDENT NO. SIZE J3 1899955
SCALE 1:1 SHEET

1899922

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY


10
9
8
7
6
5
4
3
2
2 1 R M
2
9.812
5.250 +.002 -.000
9
12
17 13 14
2 PLACES
15
90° C'SINK TO 15/16 DIA
.7500 +.0000 -.0002 DIA C'BORE
120° C'SINK TO .300 DIA
TAP FOR 1/4-28UNF-3B INSERT
ASSEMBLE PER MS 33646
TOP COIL LOCATED-3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION
3
1
1 R MAX.
18 3/8
9 5/16
10.000
6 13/32
E
E
6
SURFACE T
.500 BASIC
11.000 BASIC
9.750 BASIC
10.000 BASIC
1.750
.875
45° +5' -5'
.437 BASIC
BRAZE
SURFACE U
4.875
9 5/16
5
.625 BASIC
C
C
8
SURFACE S
11.750 BASIC
SURFACE R
D
D
7
4
.343 DIA THRU
2 HOLES
SURFACE "M"
1.063
2.125
12 3/4
14 3/4
7 3/8
6 3/8
SEE NOTE 3 (2 PLACES)
.209 +.003 -.001 DIA
3 HOLES
2 PLACES
A
A
B
B
5/16
90°
23/32
1 3/32
6 3/16
4 15/16
1 3/4
1/2
1.062
2.125
1 1/2
24.500
24 3/4
27
.209 +.003 -.001 DIA
3 HOLES
2 PLACES
.250 +.002 -.000 DIA
27 HOLES
8 1/2
3
2 5/16
5/32 x 45° CHAMFER
BRAZE
1 1/4
1/2
1 3/16
1 3/4
1/8 R MAX
1/8 R ALL AROUND
15/16 DIA
3 7/8
4 3/8
3 3/8
3 3/4 REF
3.812 +.002 -.002
1 27/32
1.562
.844
10 3 PLACES
1899955
SECTION A-A
3 3/4
1 1/2 +0 -1/64
4 1/8
1 15/16
12
1 13 14
4 PLACES
1.875
.844
.050
6 PLACES
1.938
30°
UNIT IS SYMMETRICAL ABOUT ℄
U
// U .005
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
SECTION C-C
2 PLACES
⊥ XYZ .001
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION E-E
ZONES D-5, G-8
DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES
INCHES
PHOTOGRAPHIC SCALE ONLY
SYM ZONE
6
UPGRADED
CLASS

ITEM NO.	NO. REQ'D	PART OR IDENTIFYING NUMBER
17	2	MS 35308-00
16	2	MS 21209-F4-1
15	1	MS 21209-F4-2
14	27	MS 35690-430
13	27	MS 35338-082
12	27	AN 960C416
11	25	MS-35308-00
10	3	- 01
9	1	- 00
8	1	- 00
7	1	- 00
6	1	- 00
5	1	- 00
4	1	- 00
3	1	- 00
2	1	- 00
1	1	1899955 - 00

NEXT ASSY	USED ON
1899966	1899950

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+ 1°
- 1/64	-.005	- 1°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP

DRAWN COOPER 27 NOV 62 DATE

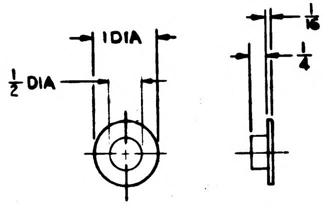
CHECKED J. Rohrpfer 4 DEC 62

APPROVED

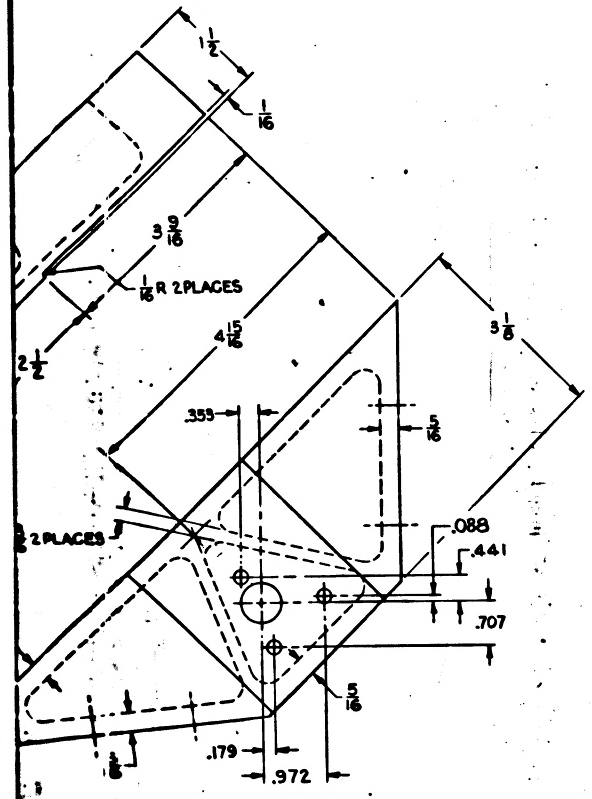
APPROVED

NASA APPROVAL

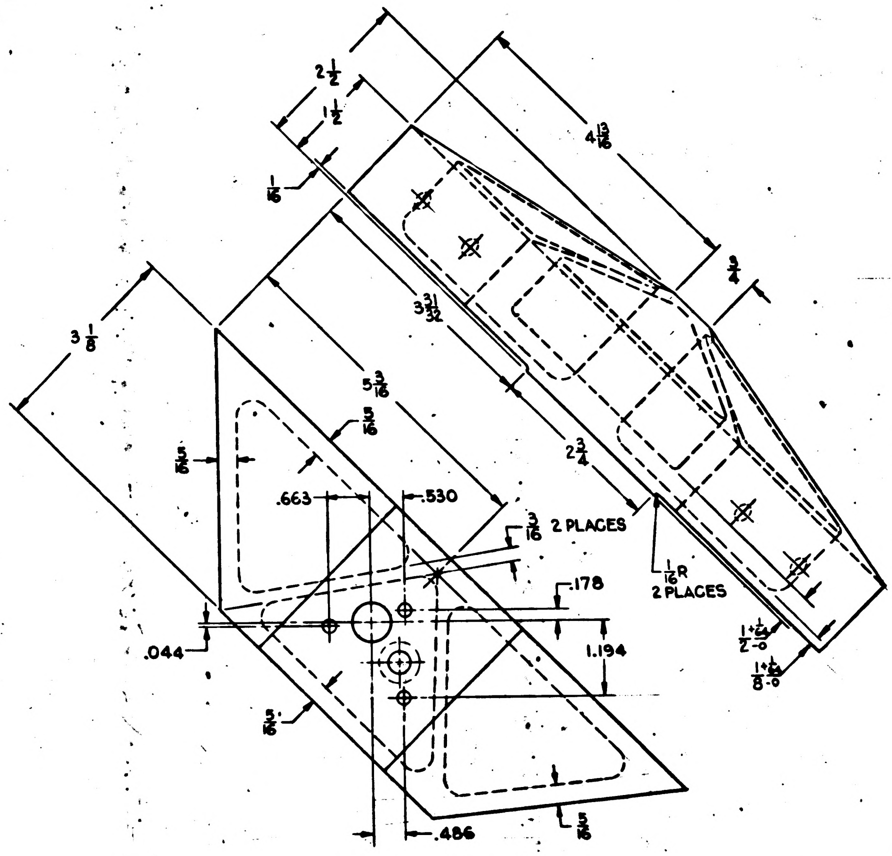
INIT APPROVAL


1 DIA
1/2 DIA
1/16 REF
1/4

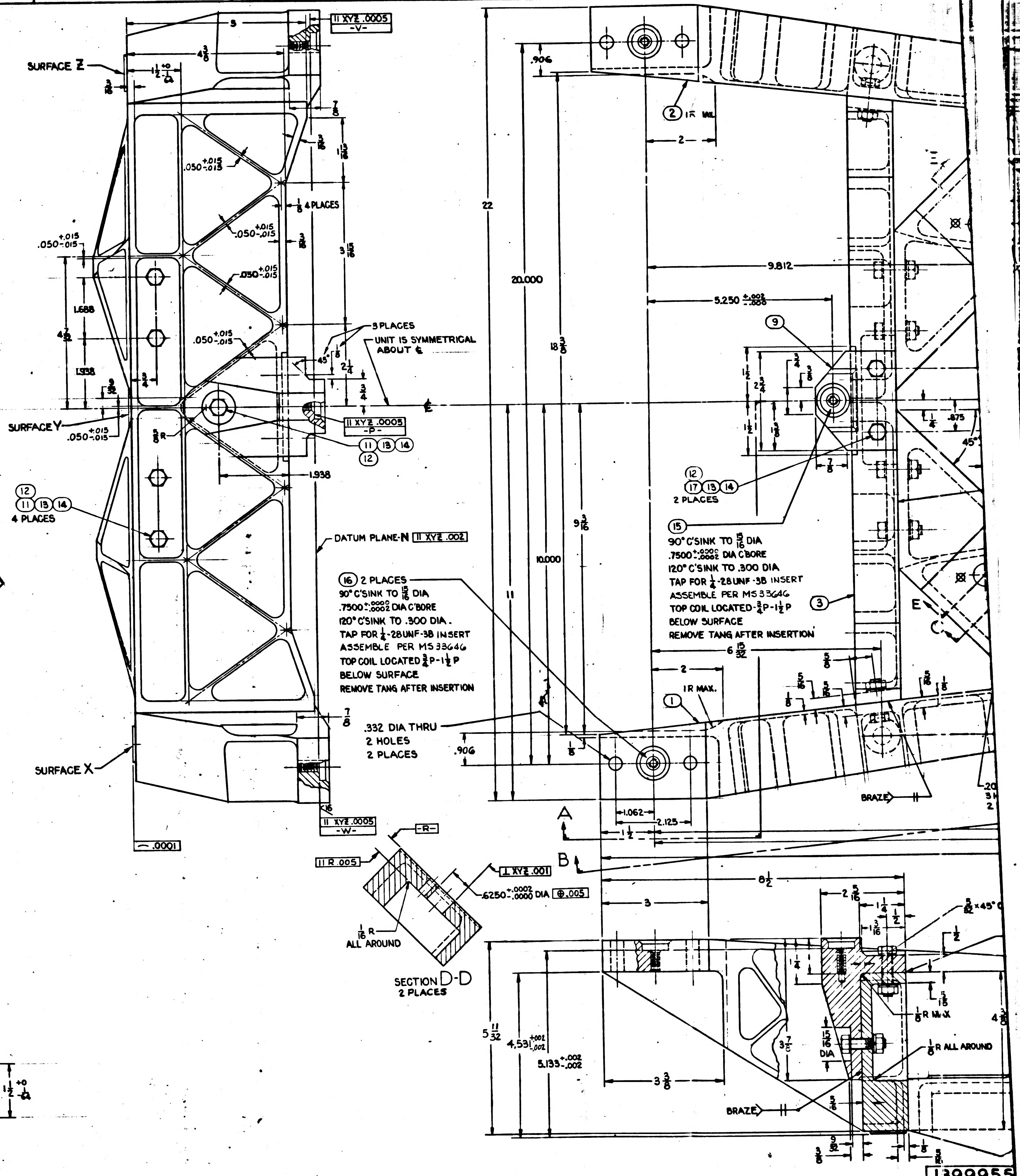
DETAIL OF ITEM ⑩

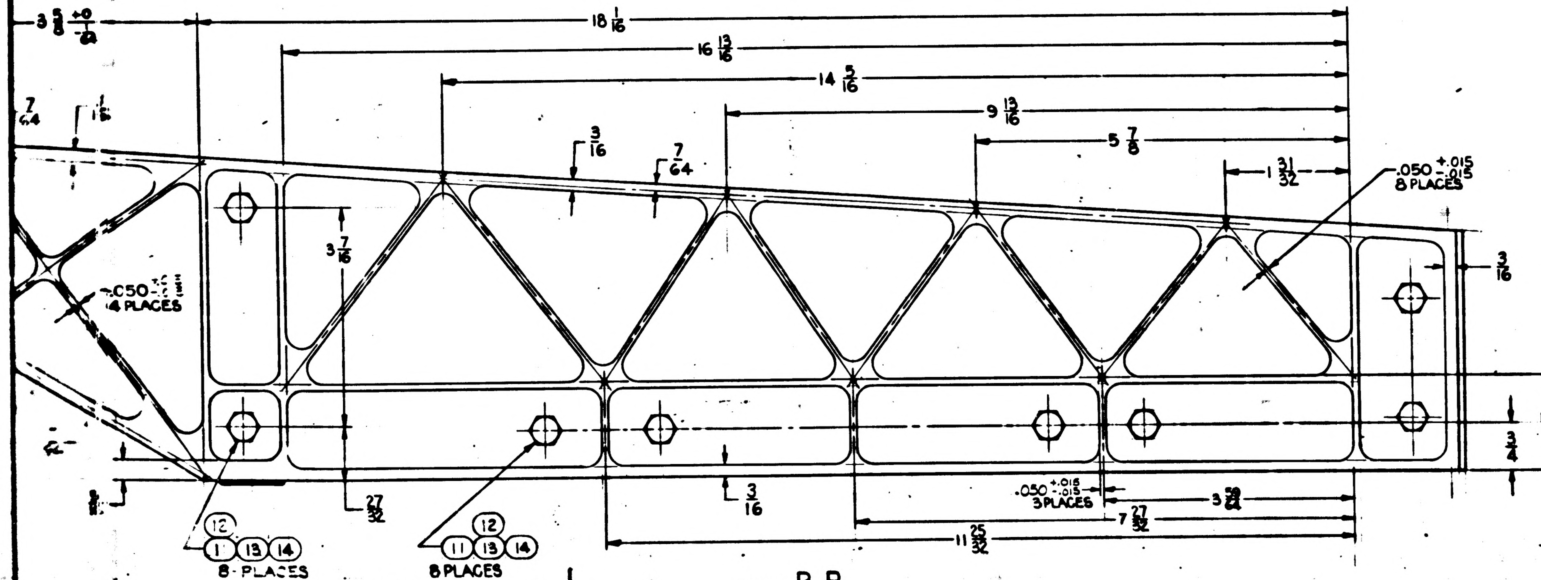

1 1/2
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
2 1/2
3 1/8
.353
5/16
2 PLACES
.088
.441
.707
.179
.972
5/16

DETAIL OF ITEM ⑦


2 1/2
1 1/2
4 13/16
1/16
3/4
3 1/8
3 31/32
5 3/16
5/16
2 3/4
.663
.530
3/16 2 PLACES
1/16 R 2 PLACES
.178
1.194
.044
5/16
.486
5/16
1 1/16 -0

DETAIL OF ITEM ⑤


SURFACE Z
3
4 3/8
1 1/2 +0 -1/64
3/16
11 XYZ .0005 -V-
7/8
3/16
1 15/16
.050 +.015 -.015
1/8 4 PLACES
3/16
3 15/16
1.688
4 7/32
1.938
9/32
3/4
3 PLACES
45°
UNIT IS SYMMETRICAL ABOUT ℄
2 1/4
3/4
℄
SURFACE Y
.050 +.015 -.015
3/8 R
11 XYZ .0005 -P-
⑪⑬⑭ ⑫
1.938
⑫ ⑪⑬⑭ 4 PLACES
DATUM PLANE-N 11 XYZ .002
⑯ 2 PLACES
90° C'SINK TO 15/16 DIA
.7500 +.0000 -.0002 DIA C'BORE
120° C'SINK TO .300 DIA.
TAP FOR 1/4-28UNF-3B INSERT
ASSEMBLE PER MS33646
TOP COIL LOCATED 3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION
7/8
.332 DIA THRU
2 HOLES
2 PLACES
SURFACE X
1/16
11 XYZ .0005 -W-
⌒ .0001
22
20.000
.906
② 1R MAX
2
9.812
5.250 +.002 -.000
⑨
3/4
1 1/2
2 3/4
1/8
18 3/8
1 1/2
1 3/8
1/4
.875
45°
7/8
⑫ ⑰⑬⑭ 2 PLACES
⑮
90° C'SINK TO 15/16 DIA
.7500 +.0000 -.0002 DIA C'BORE
120° C'SINK TO .300 DIA
TAP FOR 1/4-28UNF-3B INSERT
ASSEMBLE PER MS33646
TOP COIL LOCATED 3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION
③
E
C
10.000
9 3/16
11
6 15/32
2
5/8
5/16
1/8
1/8
① 1R MAX.
.906
1/8
1.062
2.125
1 1/2
A
B
BRAZE
-R-
11 R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
1/16 R ALL AROUND
SECTION D-D
2 PLACES
8 1/2
3
2 5/16
1 1/4
1/2
5/32 × 45°
1 3/16
1/2
1 1/4
5/16
1/8 R MAX
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 7/8
15/16 DIA
1/8 R ALL AROUND
3 3/8
BRAZE
5/8
9/32
3/8
1/8
5/16
4 3/8


3 5/8 +0 -1/64
18 1/16
16 13/16
14 5/16
9 13/16
5 7/8
1 31/32
3/16
7/64
.050 +.015 -.015 8 PLACES
7/64
1/16
3 7/16
.050 +.015 -.015 4 PLACES
3/16
1 1/2 +0 -1/64
3/4
27/32
3/16
.050 +.015 -.015 3 PLACES
7 27/32
3 29/64
11 25/32
⑫ ①⑬⑭ 8 PLACES
⑫ ⑪⑬⑭ 8 PLACES

VIEW B-B

1899955

1399955

INCHES
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH ~~MIL-B-70327~~

▷1 2. MATERIAL:

a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531

b. REFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 321, *CONDITION A.*

C. BRAZE MATERIAL - SILVER-LITHIUM PER ND 1002021.

3. REQUIREMENTS:

a. UNLESS OTHERWISE SPECIFIED:

1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS SHALL NOT EXCEED $\sqrt[63]{}$
3. ALL FILLETS $\frac{1}{4}$ R
4. ALL WEB THICKNESS TO BE .100
5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F

C. BRAZE PER ND1002020.

▷2 d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 IN. LBS.

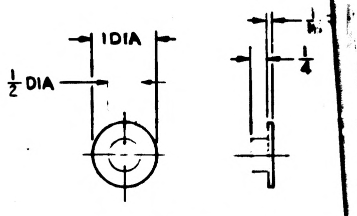
e. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.

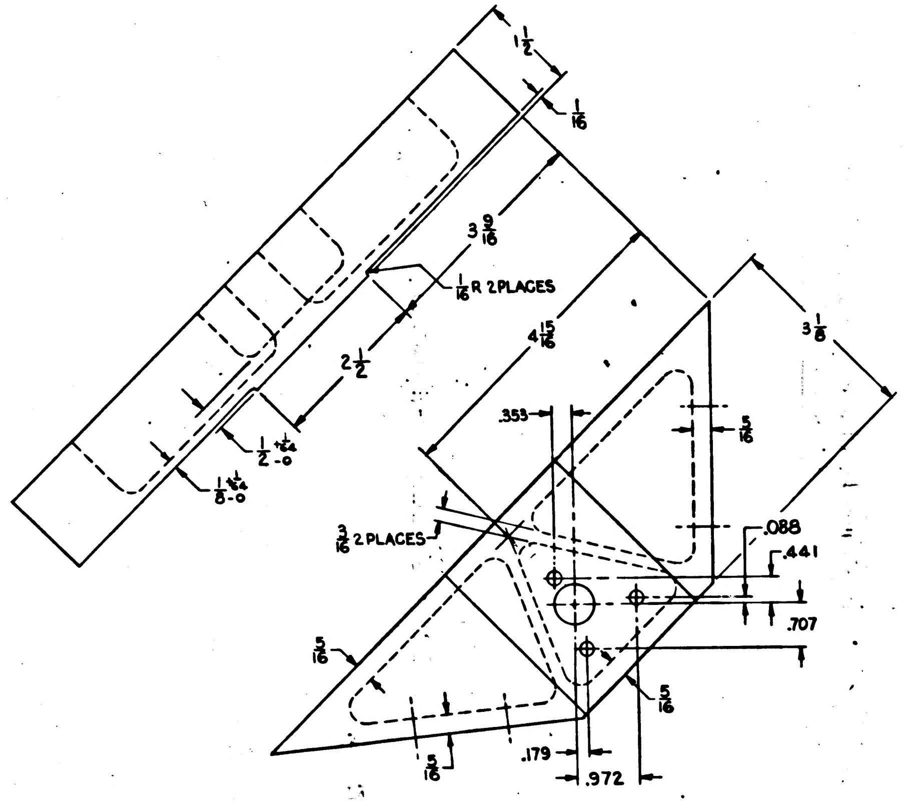
f. SURFACES RST & U TO BE $\sqrt[32]{}$ AA

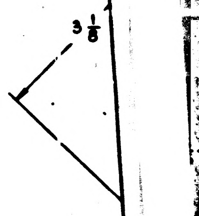
g. PRIOR TO ANY MACHINING & AFTER BRAZING, STABILIZE PER ND 1002022.

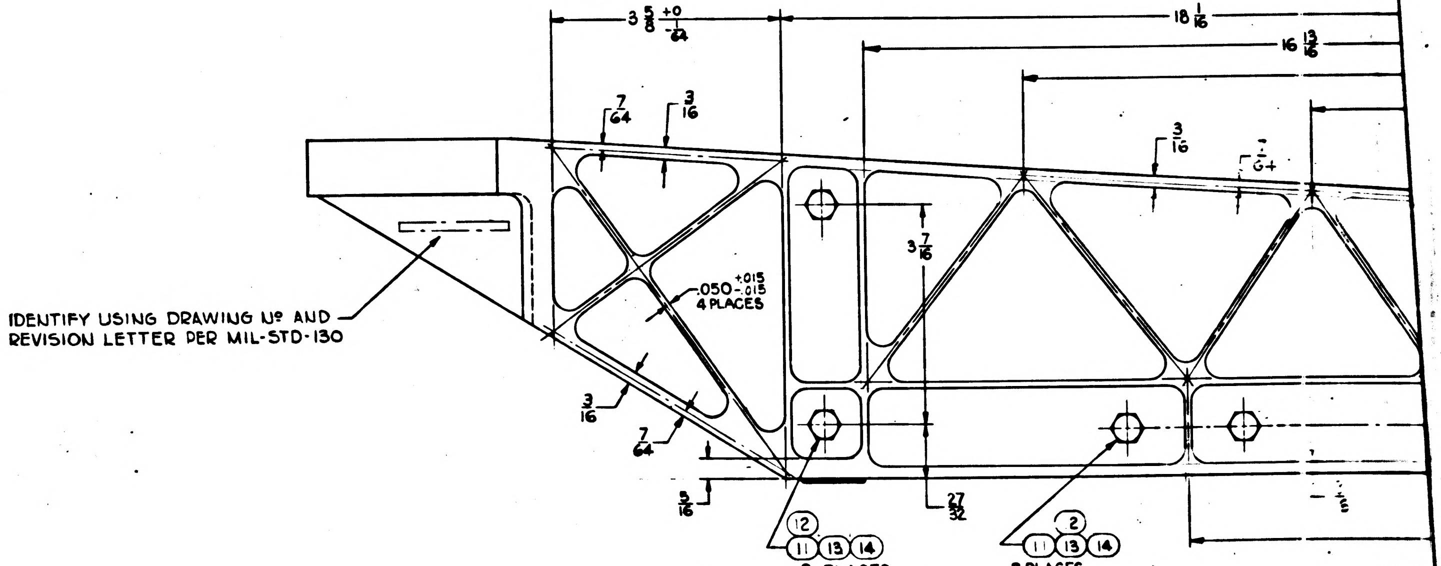
h. DATUM PLANE ·N IS DEFINED BY THE HIGH POINTS OF SURFACES P V W.

i. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 $\frac{3}{4}$ REF DIMENSION.


1 DIA
½ DIA
1/16
¼
DETAIL OF ITEM ⑩

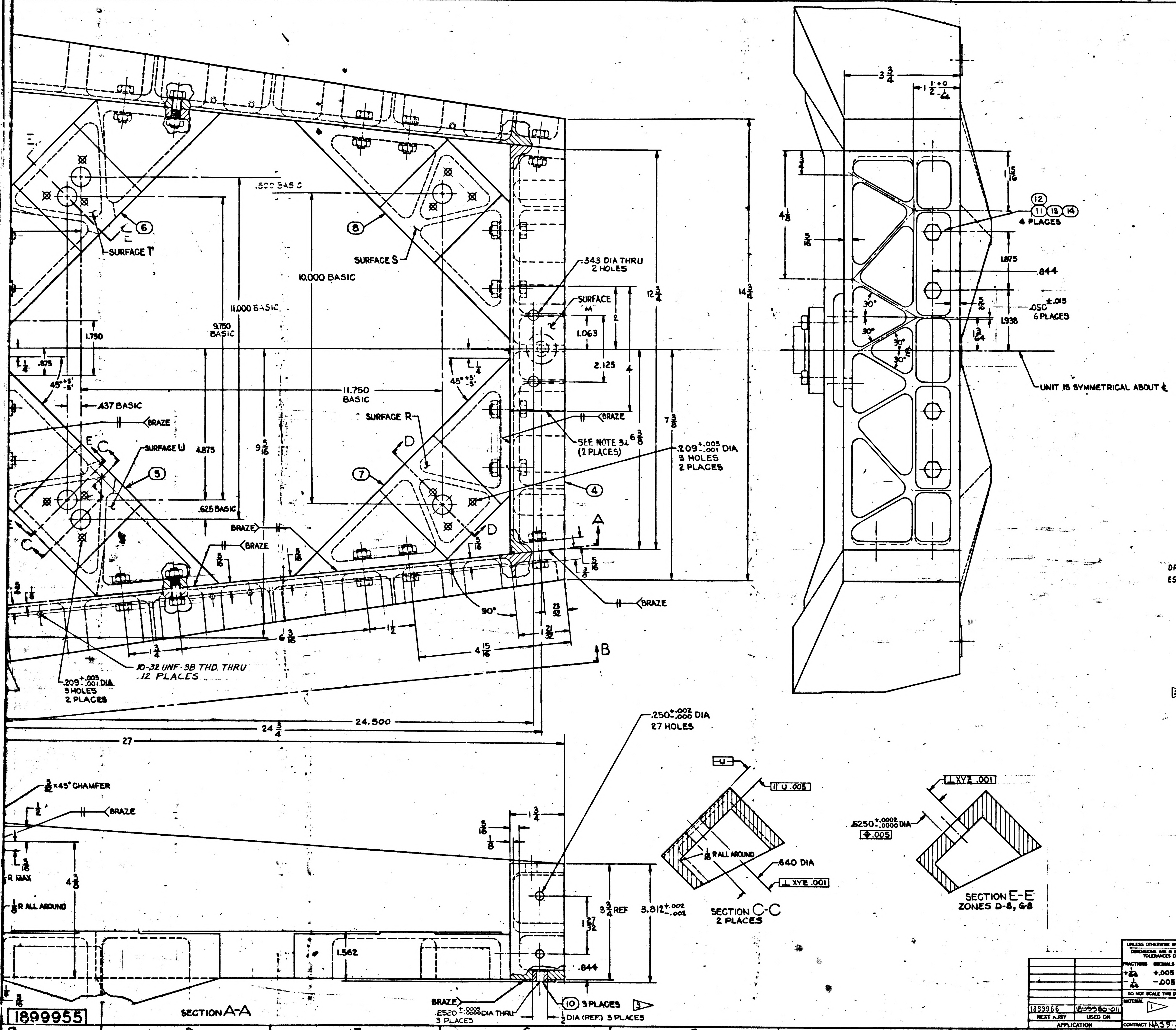

1/2
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
3 1/8
2 1/2
1/2 +1/64 -0
1 1/8 +1/64 -0
.353
5/16
3/16 2 PLACES
.088
.441
.707
5/16
5/16
5/16
.179
.972
DETAIL OF ITEM ⑦




3 5/8 +0 -1/64
18 1/16
16 13/16
7/64
3/16
3/16
3 7/16
.050 +.015 -.015 4 PLACES
IDENTIFY USING DRAWING No AND REVISION LETTER PER MIL-STD-130
3/16
7/64
5/16
27/32
12
11 13 14
8-PLACES
2
11 13 14
8 PLACES
VIEW B-B

1899955

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR TDRR01093 CLASS A RELEASE		27 APR 63	LS.
H		NOT USED		19 JULY 63	
J		REVISED IN ACCORDANCE WITH TDRR 01835		19 JULY 63	
K		REVISED IN ACCORDANCE WITH TDRR 01968		19 JULY 63	


SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE "M"
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
.343 DIA THRU 2 HOLES
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
SEE NOTE 3 (2 PLACES)
BRAZE
10-32 UNF-3B THD. THRU 12 PLACES
24.500
$24\frac{3}{4}$
27
.250 +.002 -.000 DIA 27 HOLES
UNIT IS SYMMETRICAL ABOUT ℄
4 PLACES
.050 ±.015 6 PLACES
$\frac{5}{32}$ x 45° CHAMFER
$\frac{1}{8}$ R ALL AROUND
R MAX
SECTION A-A
BRAZE .2520 +.0005 -.0000 DIA THRU 3 PLACES
⑩ 3 PLACES
$\frac{1}{2}$ DIA (REF) 3 PLACES
$3\frac{3}{4}$ REF
3.812 +.002 -.002
SECTION C-C 2 PLACES
.640 DIA
.6250 +.0002 -.0000 DIA
SECTION E-E ZONES D-8, G-8

TDR No. 00167 DATE 12 DEC '62

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	2	MS 35308-009	SCREW-HEX HD
16			
15			
14	27	MS 35690-430	NUT-PLAIN HEX
13	27	MS 35338-082	WASHER-SPLIT LOCK
12	27	AN-960C416	WASHER-PLAIN
11	25	MS-35308-008	SCREW-HEX HD
10	3	-010	PAD-REFERENCE
9	1	-009	OPTICS SUPPORT-REAR
8	1	-008	IMU SUPPORT-RH REAR
7	1	-007	-LH REAR
6	1	-006	-RH FRONT
5	1	-005	-LH FRONT
4	1	-004	BRIDGE-BACK
3	1	-003	BRIDGE-FRONT
2	1	-002	ARM-RH
1	1	1899955-001	ARM-LH

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899966	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS $\pm\frac{1}{64}$ DECIMALS ±.005 ANGLES ±1°
DO NOT SCALE THIS DRAWING
MATERIAL ①
CONTRACT NAS9-497

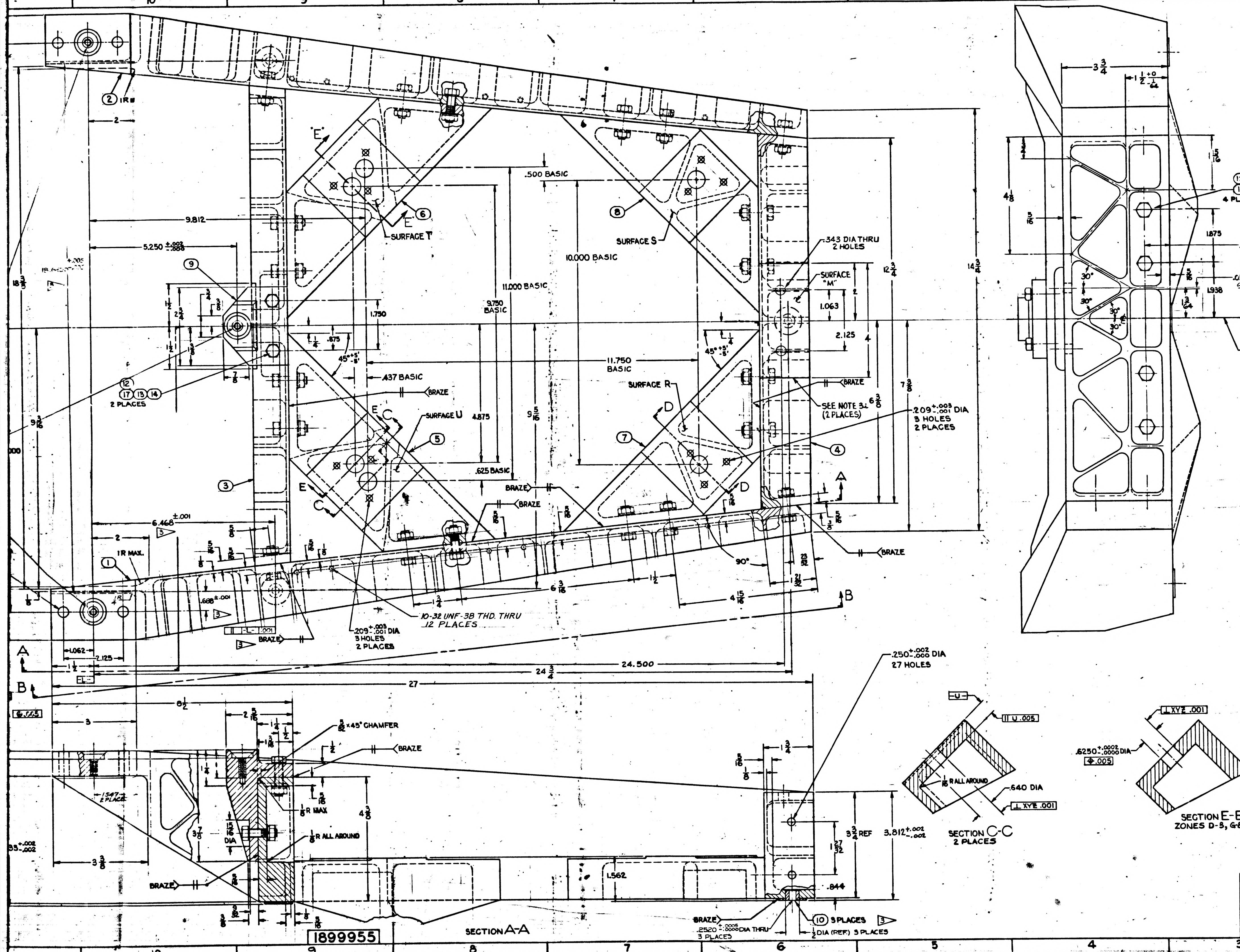
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER DATE 27 NOV 62
CHECKED 4 DEC 62
APPROVAL J. A. Hoover 4 DEC 62
APPROVAL 4 DEC 62
NASA APPROVAL 12-12-62
MIT APPROVAL 12/Dec/62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY. -
NAVIGATION BASE
(INSEP)

CODE IDENT NO. SIZE J3 1899955
SCALE 1:1 SHEET

1899955



10
9
8
7
6
5
4
3
(2) 1R
2
.500 BASIC
(6)
SURFACE T
(8)
SURFACE S
9.812
5.250 +.002 -.000
10.000 BASIC
11.000 BASIC
9.750 BASIC
.343 DIA THRU 2 HOLES
SURFACE "M"
1.063
2
2.125
4
12 3/4
14 3/4
(9)
1.750
.875
45° +5' -8'
11.750 BASIC
.437 BASIC
SURFACE R
BRAZE
SEE NOTE 3 (2 PLACES)
6 3/8
7 3/8
(12) (17) (13) (14) 2 PLACES
SURFACE U
4.875
9 5/16
(5)
(7)
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
(4)
(3)
.625 BASIC
BRAZE
E
C
D
A
6.468 ±.001
3
1R MAX.
(1)
5/16
5/8
.688 ±.001
10-32 UNF-3B THD. THRU 12 PLACES
90°
1 1/2
6 3/16
4 15/16
1 3/4
21/32
23/32
B
1.062
2.125
1 1/2
24 3/4
24.500
27
3 3/4
1 1/2 +0 -1/64
(12) (1) (13) (14) 4 PLACES
1.875
.844
.050 ±.015 5 PLACES
1.938
30°
4 1/8
15/16
13/64
UNIT IS SYMMETRICAL ABOUT ℄
8 1/2
2 5/16
1 1/4
1/2
5/32 x45° CHAMFER
BRAZE
1/8 R MAX
1/8 R ALL AROUND
15/16 DIA
3 7/8
4 3/8
3 3/8
1.547 2 PLACES
.250 +.002 -.000 DIA 27 HOLES
3 3/4 REF
3.812 +.002 -.002
1 27/32
1.562
.844
BRAZE
.2520 +.0005 -.0000 DIA THRU 3 PLACES
(10) 3 PLACES
1/2 DIA (REF) 3 PLACES
1899955
SECTION A-A
U
// U .005
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION C-C 2 PLACES
SECTION E-E ZONES D-3, G-8

DRAWING INC
ESTIMATED 12

17	2
16	
15	
14	27
13	27
12	27
11	25
10	3
9	1
8	1
7	1
6	1
5	1
4	1
3	1
2	1
1	1
ITEM NO.	NO. REQ

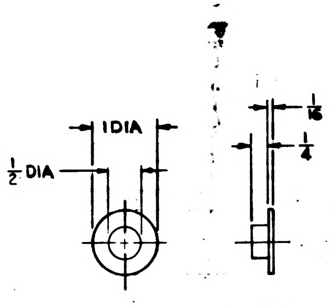
1899966	1899950-0
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

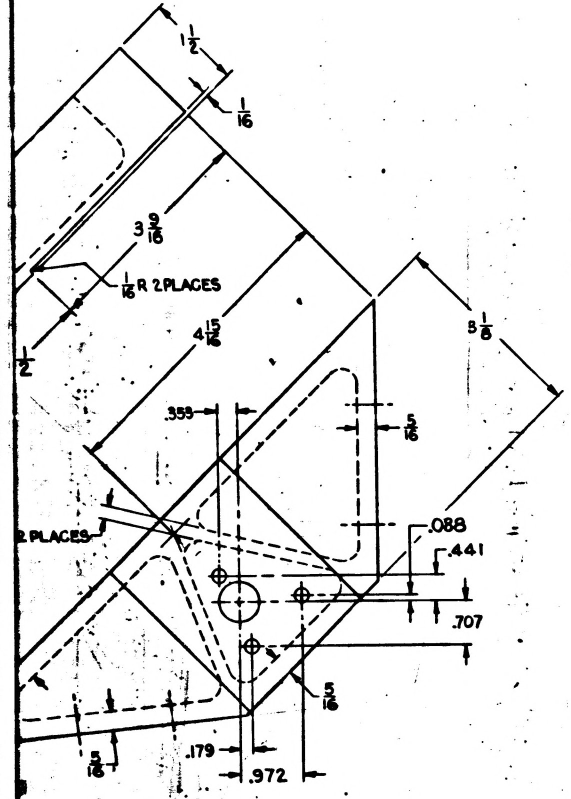
FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT AS

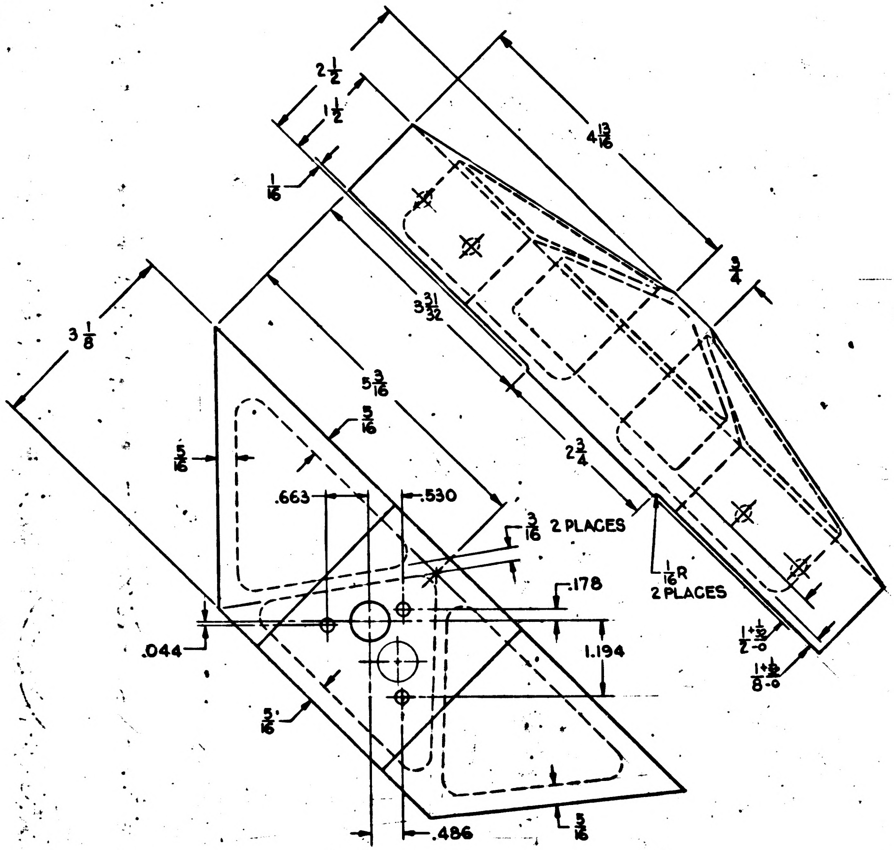
AC SP


1 DIA
1/2 DIA
1/16
1/4

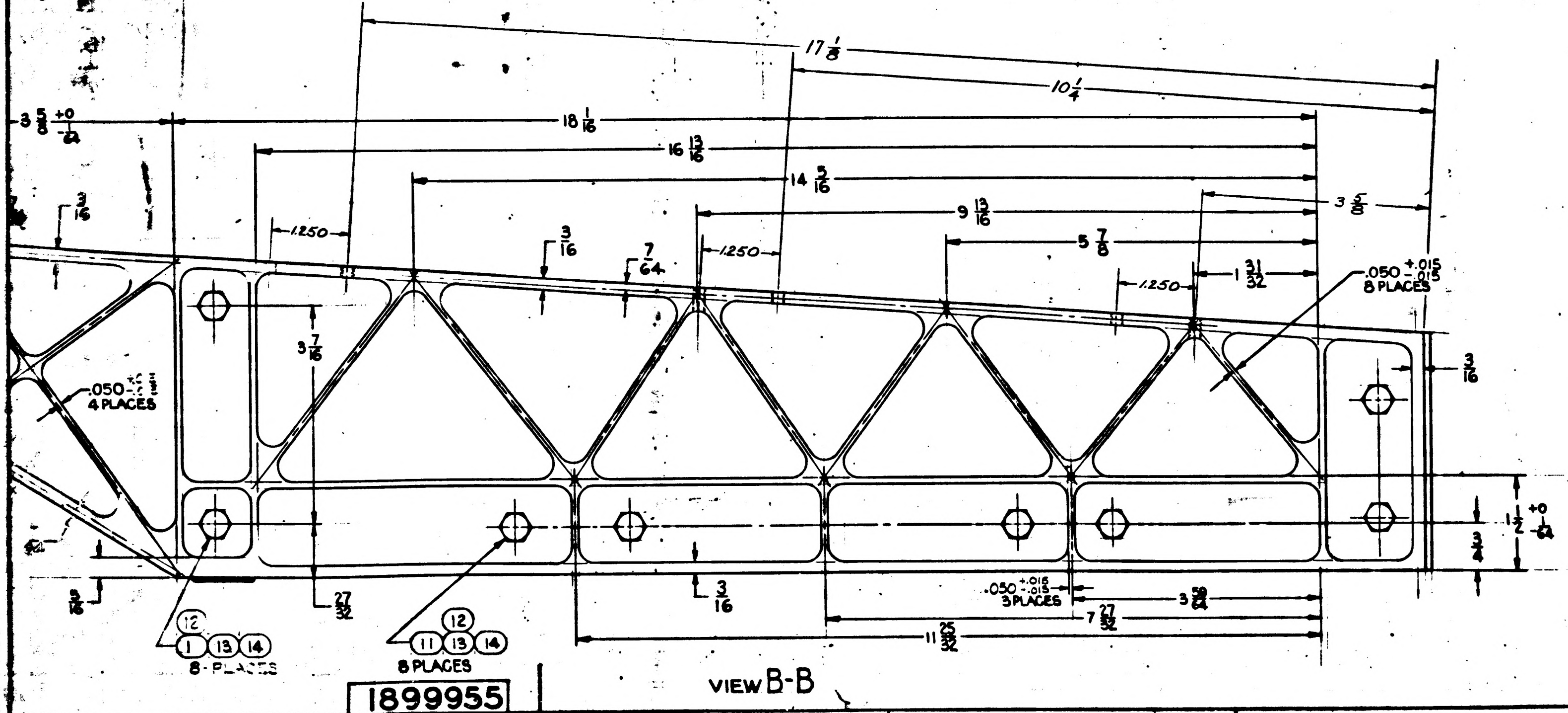
DETAIL OF ITEM ⑩


1 1/2
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
3 1/8
.355
5/16
2 PLACES
.088
.441
.707
5/16
.179
.972
5/16

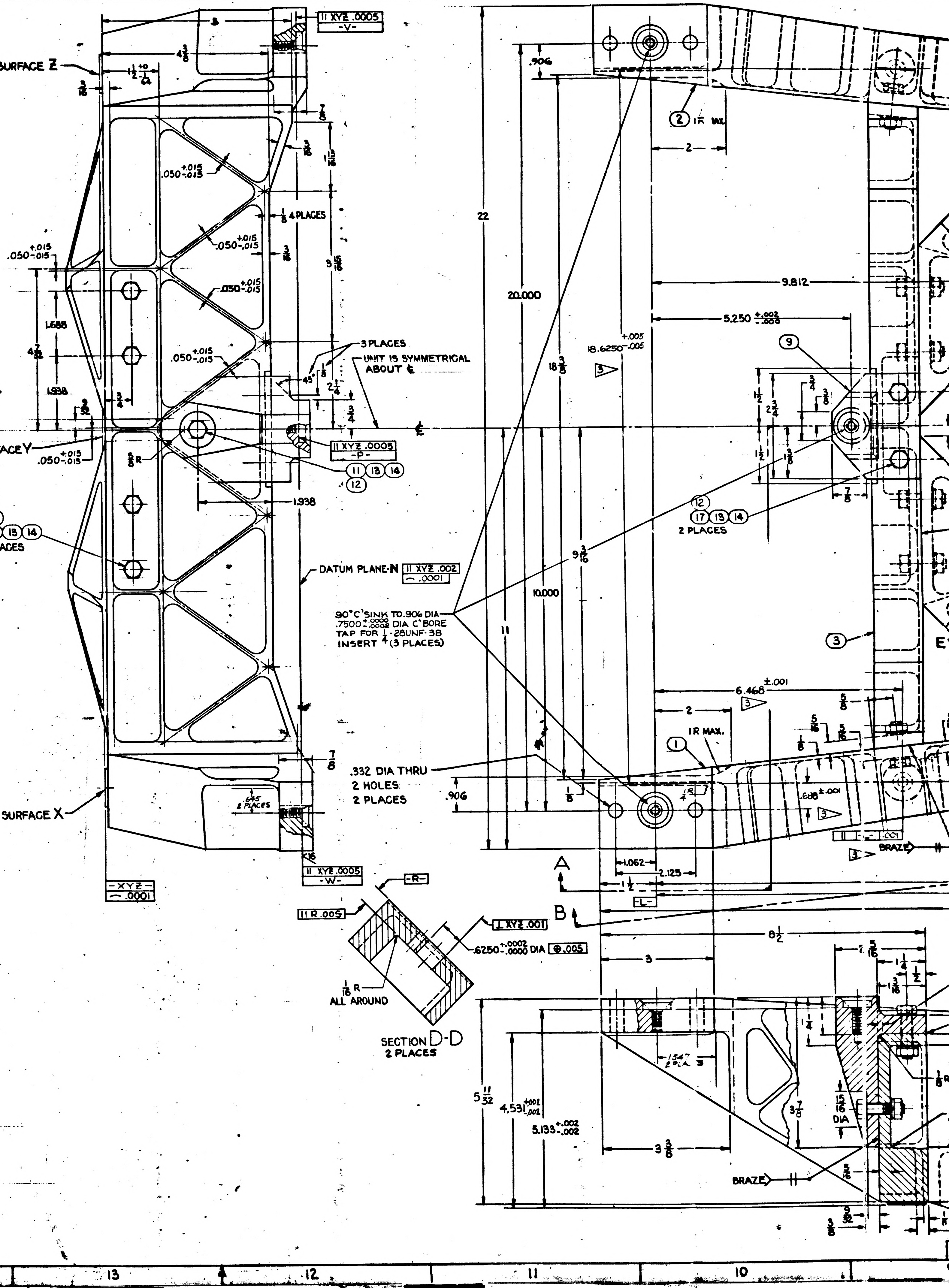
DETAIL OF ITEM ⑦ 4


2 1/2
1 1/2
1/16
4 13/16
3/4
3 1/8
3 31/32
5 3/16
5/16
5/16
2 3/4
.663
.530
3/16 2 PLACES
1/16 R 2 PLACES
.178
1.194
1 +1/2 -0
1 +1/2 -0
.044
5/16
.486
5/16

DETAIL OF ITEM ⑤ 4


17 1/8
10 1/4
3 5/8 +0 -64
18 1/16
16 13/16
14 5/16
9 13/16
5 7/8
3 5/8
3/16
1.250
3/16
7/64
1.250
1.250
1 31/32
.050 +.015 -.015 8 PLACES
3/16
3 7/16
.050 +.015 -.015 4 PLACES
1 1/2 +0 -64
3/4
3/16
.050 +.015 -.015 3 PLACES
7 27/32
3 59/64
11 25/32
27/32
5/16
⑫ ① ⑬ ⑭ 8 PLACES
⑫ ⑪ ⑬ ⑭ 8 PLACES

VIEW B-B


SURFACE Z
11 XYZ .0005 -V-
4 3/8
1 1/2 +0 -64
3/16
7/8
3/16
1 13/16
.050 +.015 -.015
1/8 4 PLACES
.050 +.015 -.015
3/16
3 15/16
.050 +.015 -.015
.050 +.015 -.015
1.688
4 7/32
.050 +.015 -.015
3 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
45°
1/8
2 1/4
3/4
1.938
9/32
3/4
SURFACE Y
.050 +.015 -.015
11 XYZ .0005 -P-
⑪ ⑬ ⑭
⑫
5/8 R
1.938
⑫ ⑪ ⑬ ⑭ 4 PLACES
DATUM PLANE-N 11 XYZ .002 .0001
90° C'SINK TO .906 DIA .7500 +.0000 -.0002 DIA C'BORE TAP FOR 1/4-28UNF-3B INSERT (3 PLACES)
7/8
.332 DIA THRU 2 HOLES 2 PLACES
SURFACE X
.645 2 PLACES
11 XYZ .0005 -W-
-XYZ- .0001
-R-
11 R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
1/16 R ALL AROUND
SECTION D-D 2 PLACES
.906
② 1R MAX.
2
22
20.000
18.6250 +.005 -.005
3
18 3/8
9.812
5.250 +.002 -.003
⑨
3/4
1 1/2
2 3/4
3/8
1 3/8
7/8
⑫ ⑰ ⑬ ⑭ 2 PLACES
9 3/16
10.000
11
③
E
6.468 ±.001
3
2
① 1R MAX.
5/8
5/16
1/8
.688 ±.001
3
.001
3 BRAZE
.906
1/8
4 1/8
A
1.062
2.125
1 1/2
-L-
B
8 1/2
3
7 5/16
1 1/4
1 1/2
1/8
1/4
1.547 2 PLA
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 7/8
15/16 DIA
3 3/8
BRAZE
5/16
9/32
3/8
1/8 R

1899955

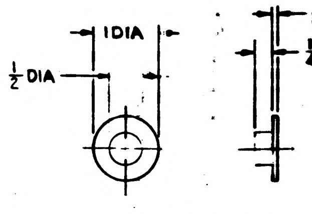
INCHES
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH ~~MIL-B-70327~~

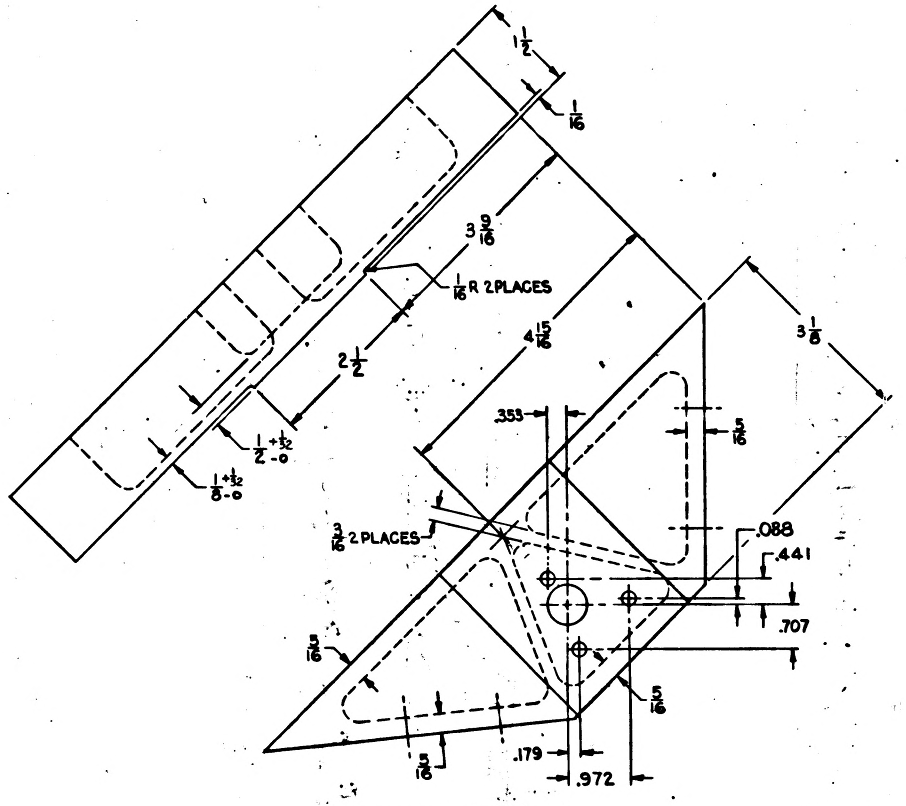
2. MATERIAL:
   - a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531
   - b. REFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A.
   - C. BRAZE MATERIAL - SILVER-LITHIUM PER ND 1002021.

3. REQUIREMENTS:
   - a. UNLESS OTHERWISE SPECIFIED:
     - 1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
     - 2. SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\checkmark}$
     - 3. ALL FILLETS $\frac{1}{4}$ R
     - 4. ALL WEB THICKNESS TO BE .100
     - 5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F
   - C. BRAZE PER ND1002020.

   - ② d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 IN. LBS.
   - e. PLANE CONTAINING SURFACES R, S, T & U MUST BE PARALLEL WITH PLANE -XYZ- WITHIN .005.
   - f. SURFACES RST & U TO BE $\overset{32}{\checkmark}$AA
   - g. PRIOR TO ANY MACHINING & AFTER BRAZING, STABILIZE PER ND 1002022.
   - h. DATUM PLANE -N IS DEFINED BY THE HIGH POINTS OF SURFACES P V W.
   - i. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW $3\frac{3}{4}$ REF DIMENSION.
   - ③ J. THESE TOLERANCE & PARALLELISM NOTES APPLY ONLY TO .2520 DIA. HOLE AND THE TOLERANCE FOR LOCATING ITEM 10 IS ± .015.
   - ④ K. THESE FRACTIONAL DIMENSIONS ARE TO BE INSPECTED PRIOR TO BRAZING.

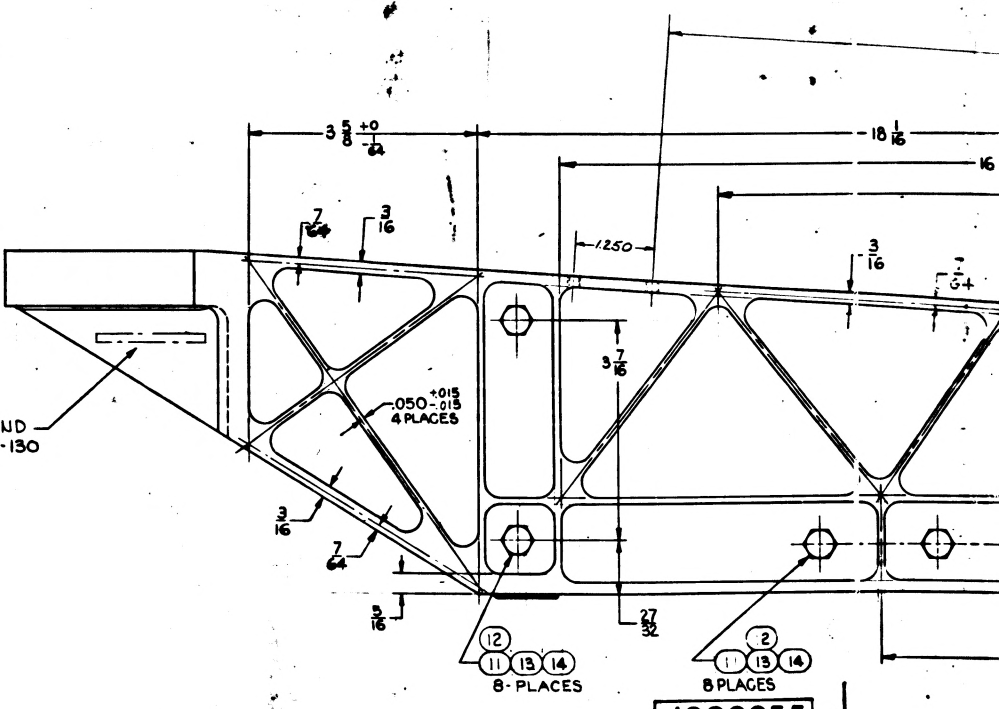


DETAIL OF ITEM 10


½
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
3 1/8
2 ½
½ +1/32 -0
1/8 +1/32 -0
.353
5/16
3/16 2 PLACES
.088
.441
.707
5/16
5/16
5/16
.179
.972

DETAIL OF ITEM ⑦

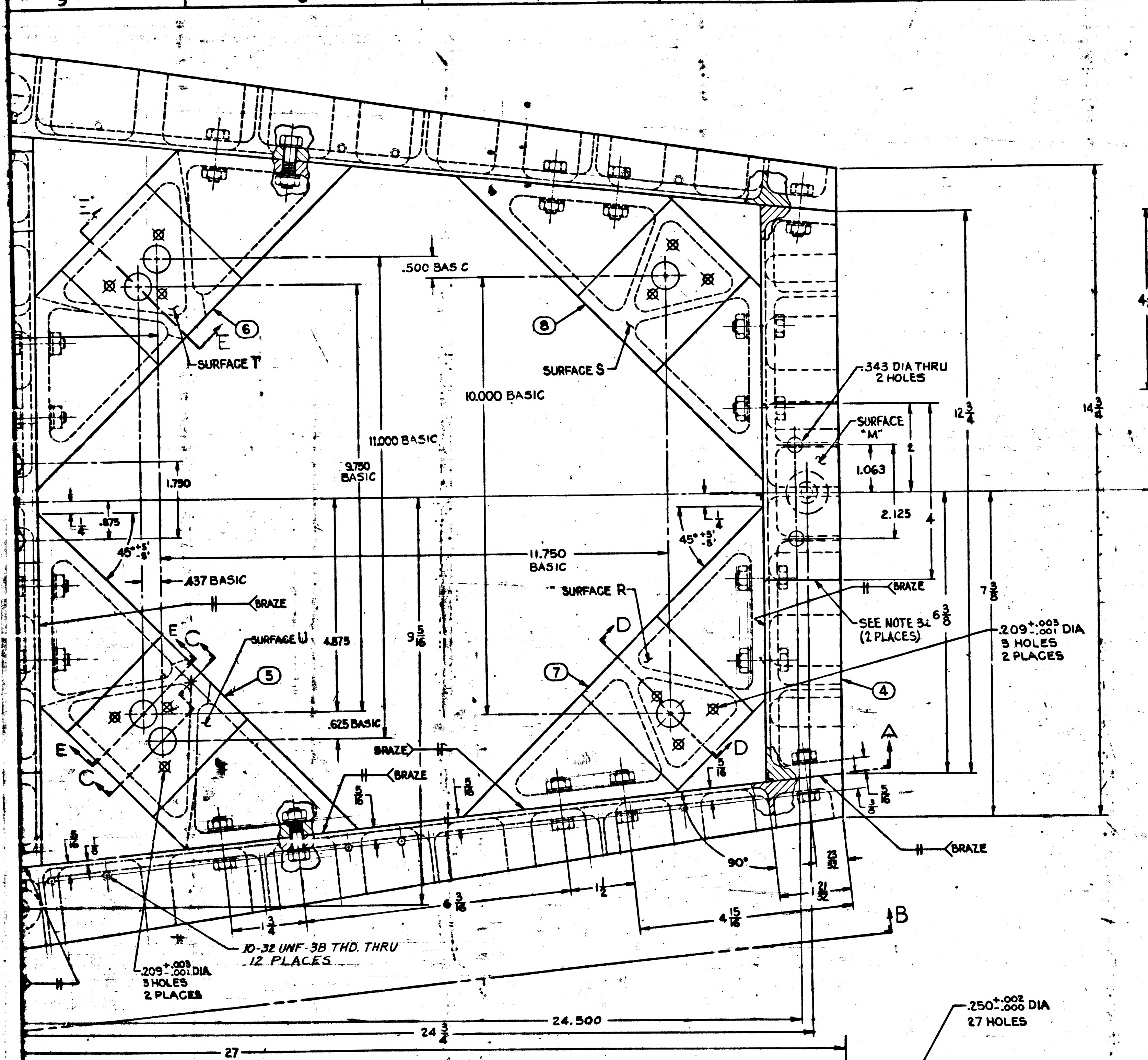
④


3 5/8 +0 -1/64
18 1/16
16
7/64
3/16
1250
3/16
3 7/16
.050 +.015 -.015 4 PLACES
3/16
7/64
5/16
27/32
⑫ ⑪ ⑬ ⑭ 8-PLACES
② ⑪ ⑬ ⑭ 8 PLACES

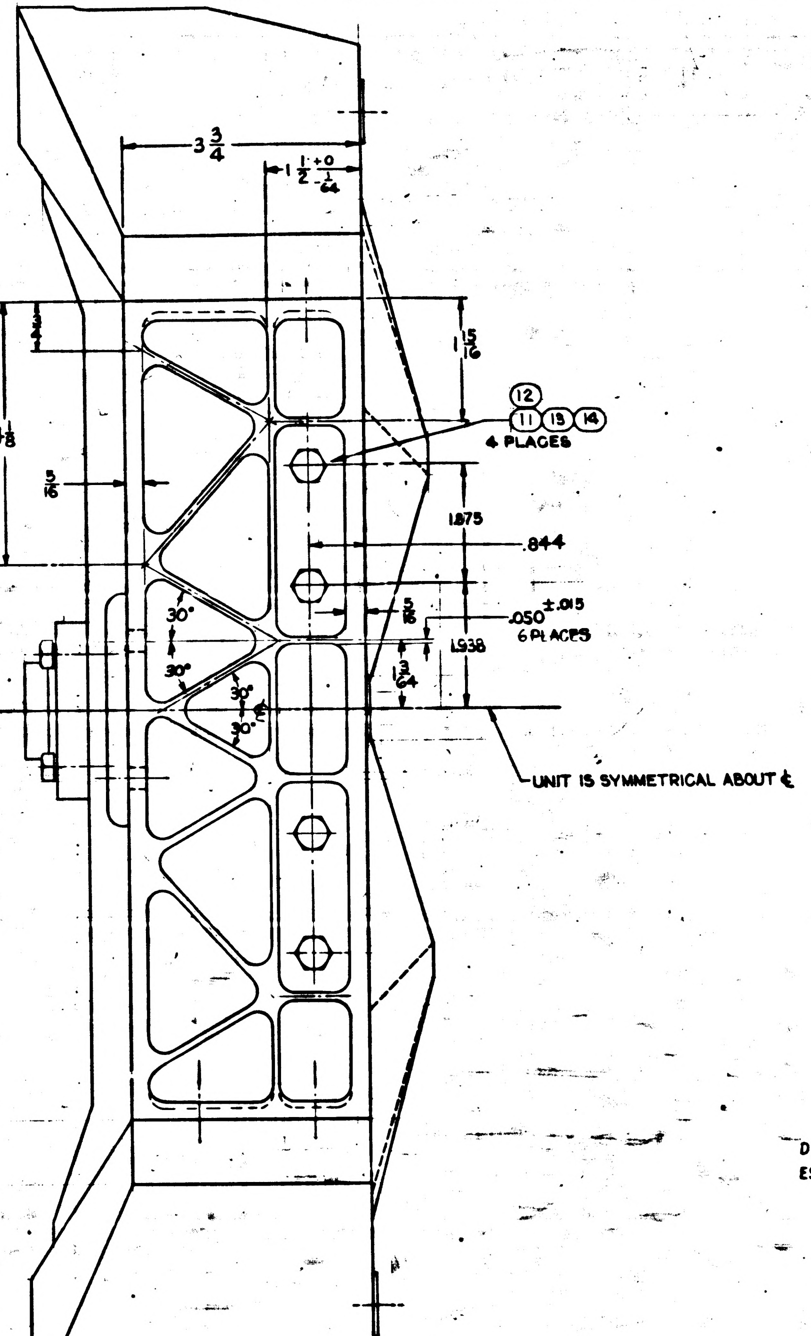
IDENTIFY USING DRAWING Nº AND REVISION LETTER PER MIL-STD-130

1899955

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		UPGRADED FOR TDRR01093 CLASS A RELEASE		27 APR 63	LG
H		NOT USED		19 JULY 63	
J		REVISED IN ACCORDANCE WITH TDRR 01835		19 JULY 63	
K		REVISED IN ACCORDANCE WITH TDRR 01968		19 JULY 63	23 July WK
L	-	REVISED IN ACCORDANCE WITH TDRR 02309		31 July 63	R.W.G



.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
1.790
1/4
.875
45° +5' -5'
.437 BASIC
BRAZE
SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE "M"
4.875
9 5/16
.625 BASIC
11.750 BASIC
.343 DIA THRU 2 HOLES
1.063
2.125
2
4
6 3/8
7 3/8
12 3/4
14 3/4
SEE NOTE 3 (2 PLACES)
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
⑥
⑧
⑤
⑦
④
A
B
C
D
E
5/16
3/8
90°
23/32
21/32
1 1/2
6 3/16
4 15/16
1 3/4
10-32 UNF-3B THD. THRU 12 PLACES
24.500
24 3/4
27

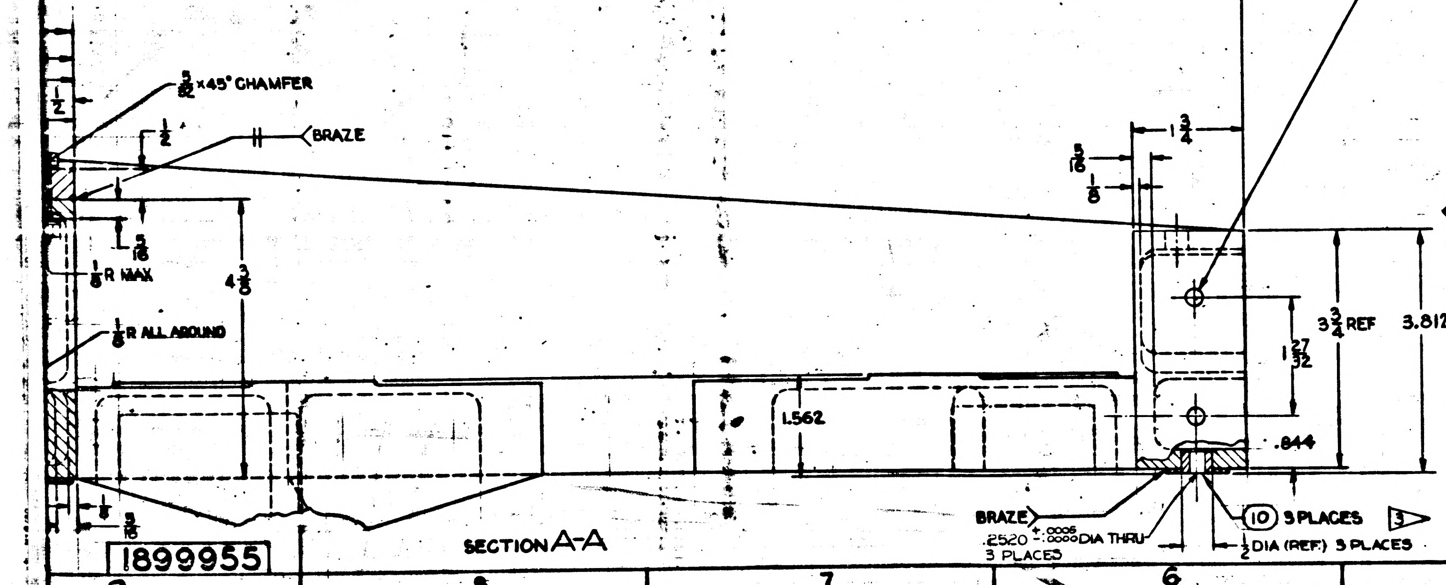


3 3/4
1 1/2 +0 -1/64
1 5/16
4 1/8
5/16
⑫
⑪ ⑬ ⑭
4 PLACES
1.875
.844
.050 ±.015 6 PLACES
1.938
1 3/4
30°
UNIT IS SYMMETRICAL ABOUT ℄

TDR No. 00167 DATE 12 DEC '62

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

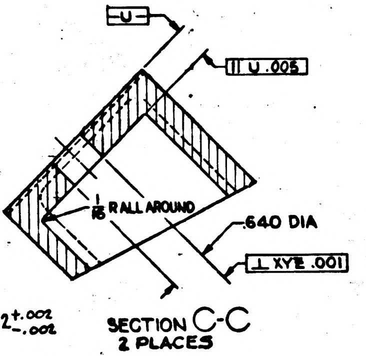
17	2	MS 35308-009	SCREW-HEX HD
16			
15			
14	27	MS 35690-430	NUT-PLAIN HEX
13	27	MS 35338-082	WASHER-SPLIT LOCK
12	27	AN-960C416	WASHER-PLAIN
11	25	MS-35308-008	SCREW-HEX HD
10	3	-010	PAD-REFERENCE
9	1	-009	OPTICS SUPPORT-REAR
8	1	-008	IMU SUPPORT-RH REAR
7	1	-007	-LH REAR
6	1	-006	-RH FRONT
5	1	-005	-LH FRONT
4	1	-004	BRIDGE-BACK
3	1	-003	BRIDGE-FRONT
2	1	-002	ARM-RH
1	1	1899955-001	ARM-LH
ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		LIST OF PARTS AND MATERIALS	



5/32 x45° CHAMFER
1/2
BRAZE
5/16
1/8
1/8 R MAX
1/8 R ALL AROUND
4 3/8
1 3/4
3 3/4 REF
3.812 +.002 -.002
1 27/32
1.562
.844
.250 +.002 -.000 DIA 27 HOLES
.2520 +.0005 -.0000 DIA THRU 3 PLACES
⑩ 3 PLACES
1/2 DIA (REF) 3 PLACES

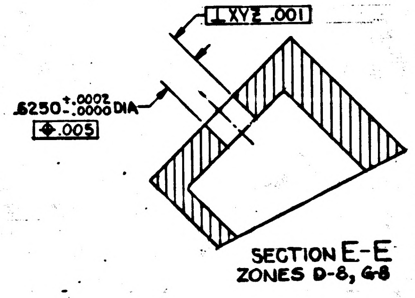
SECTION A-A

1899955



U
∥ U .005
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001

SECTION C-C
2 PLACES



⊥ XYZ .001
.6250 +.0002 -.0000 DIA
⌖ .005

SECTION E-E
ZONES D-8, G-8

MASTER

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± 1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER DATE 27 NOV 62
CHECKED 4 DEC 62
APPROVAL J. A. Hann 4 DEC 62
APPROVAL 4 DEC 62
NASA APPROVAL W. J. Rhine 12-2-62
MIT APPROVAL 12 Dec 62

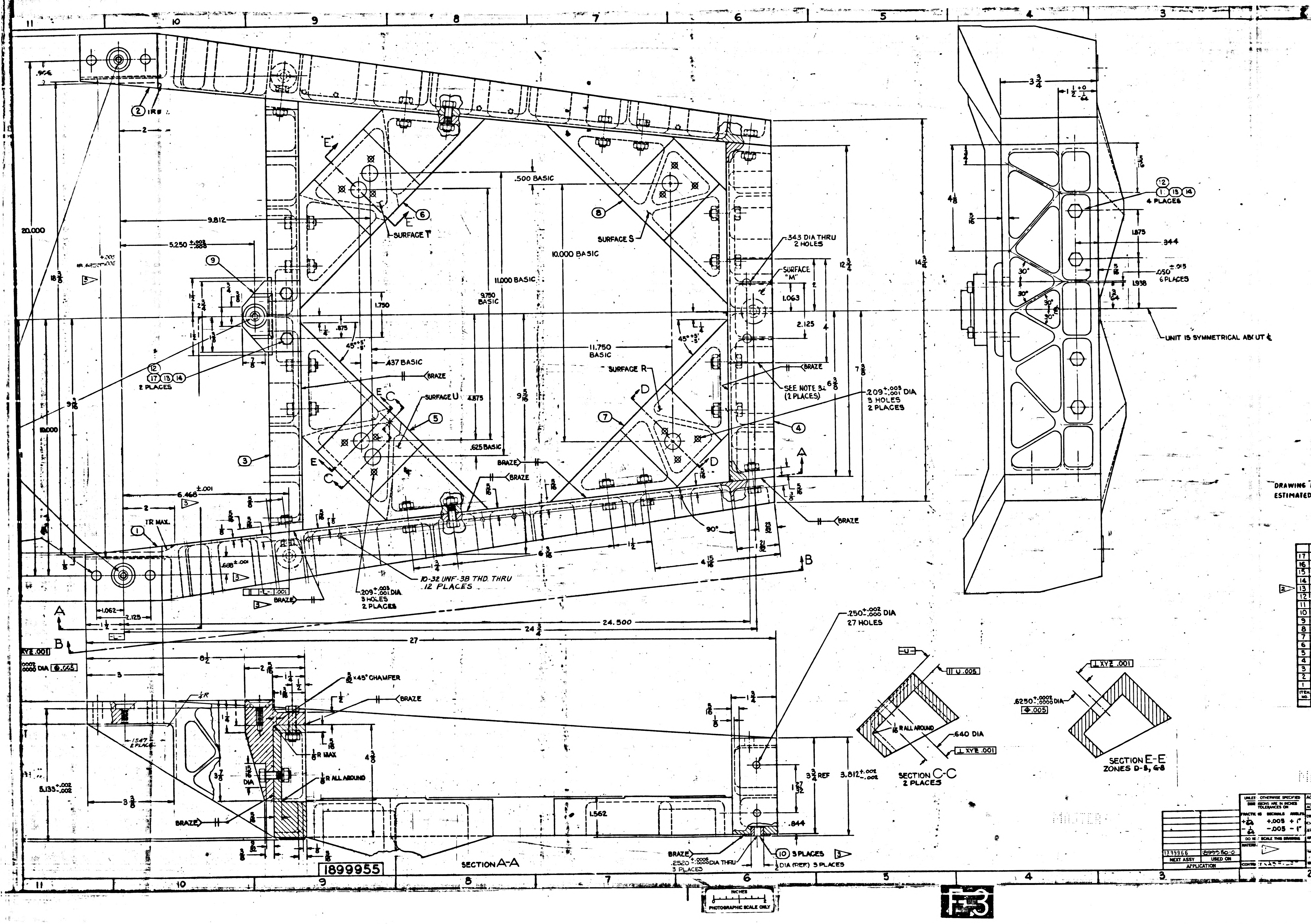
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

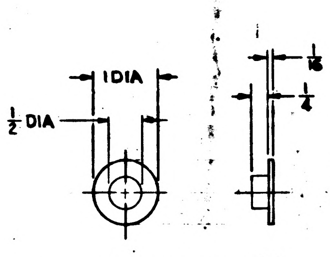
STRUCTURAL ASSY. -
NAVIGATION BASE
(INSEP)

CODE IDENT NO.
SIZE J3
1899955
SCALE 1:1
SHEET

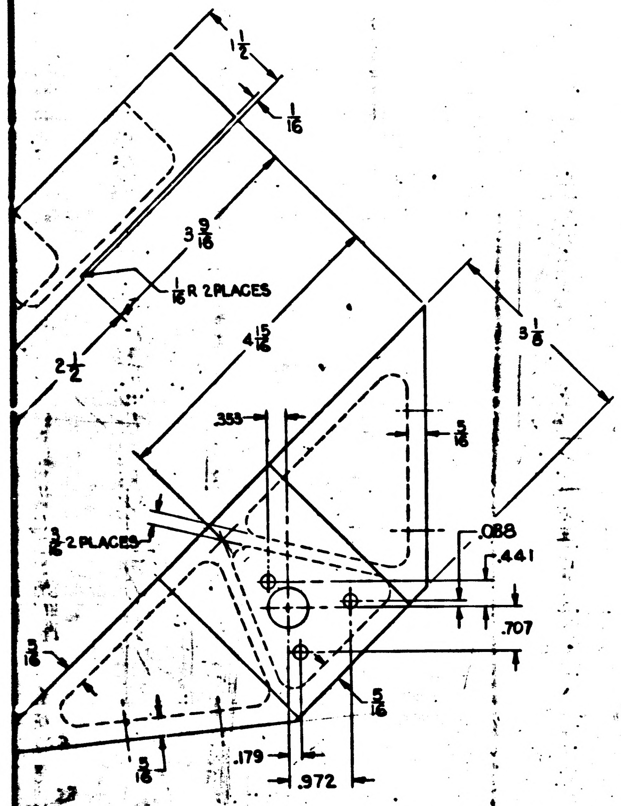
INCHES
PHOTOGRAPHIC SCALE ONLY

E-4


11
10
9
8
7
6
5
4
3
.906
② 1R8
2
20.000
9.812
5.250 +.002 -.000
18 3/8
18.6875 +.005 -.005
3
⑨
1 1/2
2 3/4
3/4
3/8
1 1/2
1 3/8
7/8
⑫
⑰ ⑬ ⑭
2 PLACES
9 1/16
18.000
③
6.468 ±.001
3
2
1R MAX.
①
1/8
5/8
5/16
5/16
.688 ±.001
3
.001
3
BRAZE
1.062
2.125
1 1/2
L
A
B
XYZ .001
.0002 .0000 DIA ⊕ .005
E
⑥
E
SURFACE T
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
1.750
1/4
.875
45° +5' -5'
.437 BASIC
BRAZE
E C
SURFACE U
4.875
⑤
9 5/16
.625 BASIC
E
C
BRAZE
BRAZE
5/16
5/16
⑧
SURFACE S
11.750 BASIC
SURFACE R
D
⑦
D
1/4
45° +5' -5'
.343 DIA THRU 2 HOLES
SURFACE "M"
1.063
2
2.125
4
12 3/4
SEE NOTE 3 (2 PLACES)
6 3/8
7 3/8
BRAZE
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
④
A
5/16
3/8
BRAZE
90°
23/32
1 21/32
1 1/2
6 3/16
4 15/16
1 3/4
B
10-32 UNF-3B THD. THRU 12 PLACES
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
24.500
24 3/4
27
3 3/4
1 1/2 +0 -1/64
2
4 1/8
5/16
14 3/4
5/16
⑫
① ⑬ ⑭
4 PLACES
1.875
.344
.050 ±.015 6 PLACES
5/16
1.938
1 3/64
30°
30°
30°
30°
UNIT IS SYMMETRICAL ABOUT ℄
DRAWING
ESTIMATED
8 1/2
2 5/16
1 1/4
1 1/2
1/2
5/32 x 45° CHAMFER
BRAZE
3
1/4 R
1.547 2 PLACES
1/4
1/8 R MAX
4 3/8
5.139 +.002 -.002
3 7/8
15/16 DIA
1/8 R ALL AROUND
3 3/8
BRAZE
5/16
9/32
3/8
3/16
1899955
SECTION A-A
1.562
1 3/4
5/16
1/8
3 3/4 REF
3.812 +.002 -.002
1 27/32
.844
BRAZE
.2520 +.0005 -.0000 DIA THRU 3 PLACES
⑩ 3 PLACES
3
1/2 DIA (REF) 3 PLACES
.250 +.002 -.000 DIA 27 HOLES
U
∥ U .005
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
⊥ XYZ .001
SECTION E-E ZONES D-8, G-8
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
ITEM NO.
2
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS
DECIMALS
ANGLES
+1/64
-1/64
+.005
-.005
+1°
-1°
DO NOT SCALE THIS DRAWING
MATERIAL
1299966
1899950-0
NEXT ASSY
USED ON
APPLICATION
CONTR
INCHES
PHOTOGRAPHIC SCALE ONLY
F-3

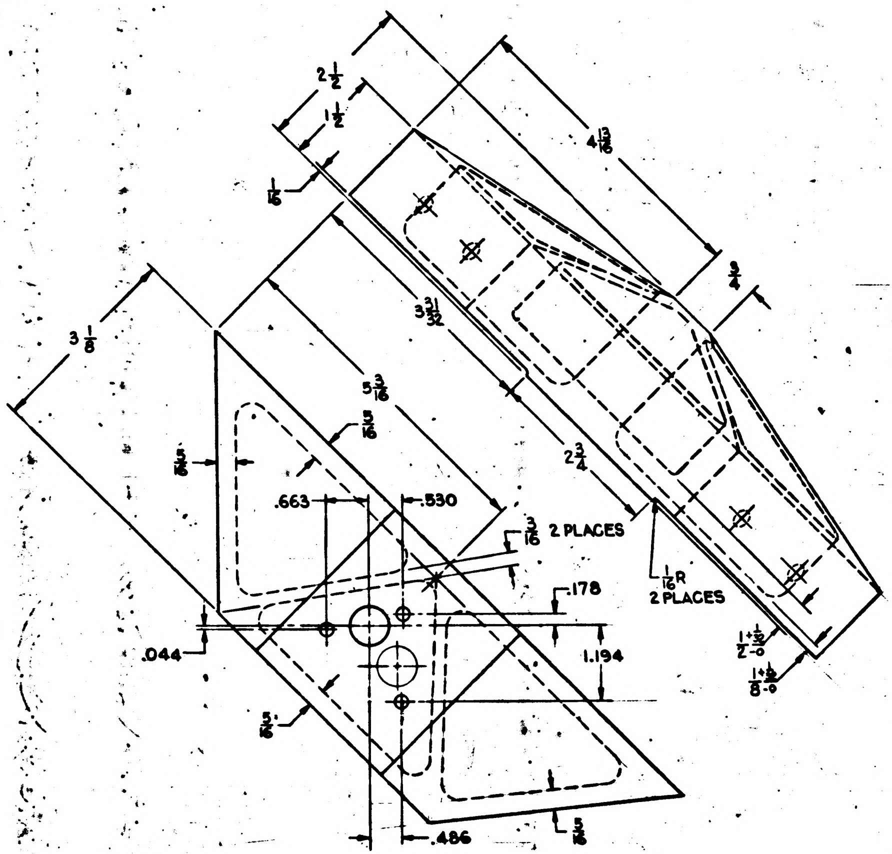

1 DIA
1/2 DIA
1/16
1/4

DETAIL OF ITEM ⑩


1 1/2
1/16
3 9/16
1/8 R 2 PLACES
4 15/16
3 5/8
2 1/2
.353
5/16
1/8 2 PLACES
.088
.441
.707
3/16
5/16
.179
.972
5/16
27

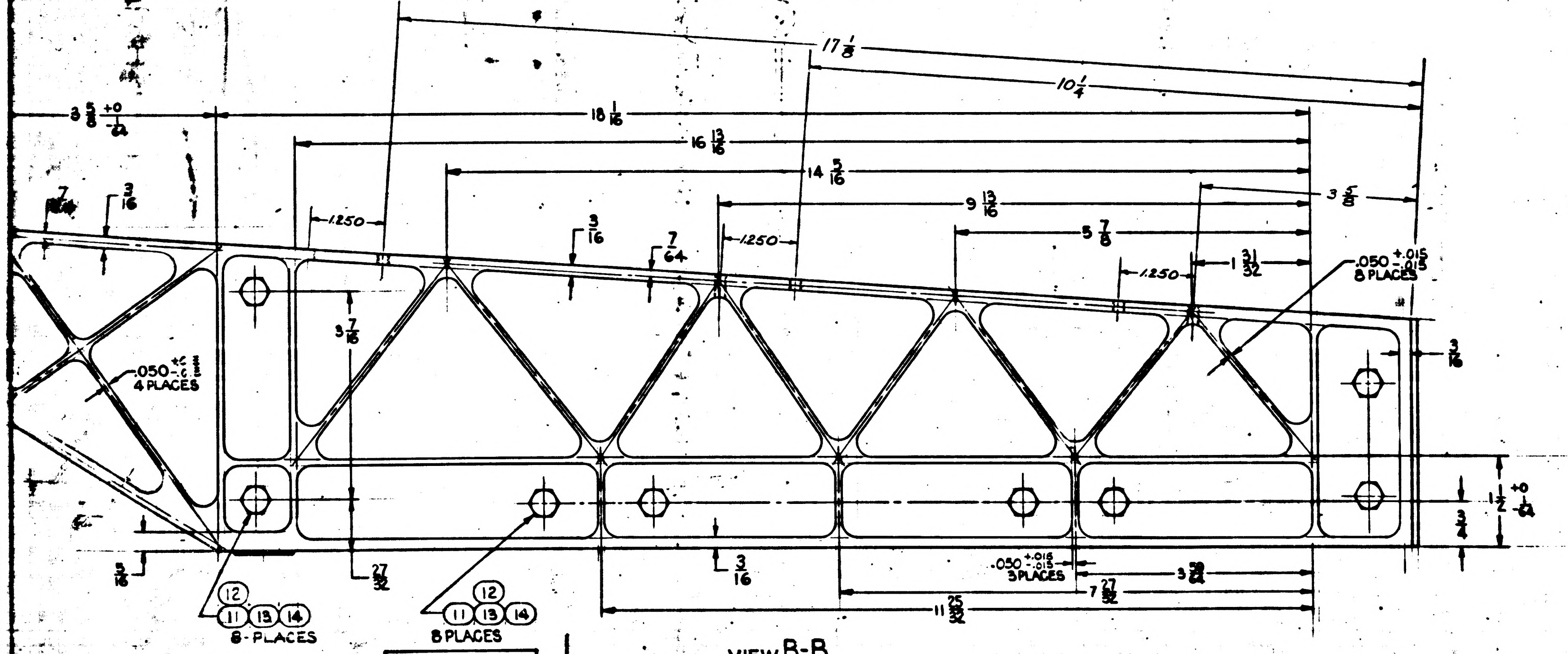
DETAIL OF ITEM ⑦

4


2 1/2
1 1/2
4 13/16
1/16
3/4
3 1/8
3 31/32
5 3/16
5/16
5/16
2 3/4
.663
.530
3/16 2 PLACES
1/16 R 2 PLACES
.178
1.194
1+1/2 -0
1+1/8 -0
.044
5/16
.486
5/16

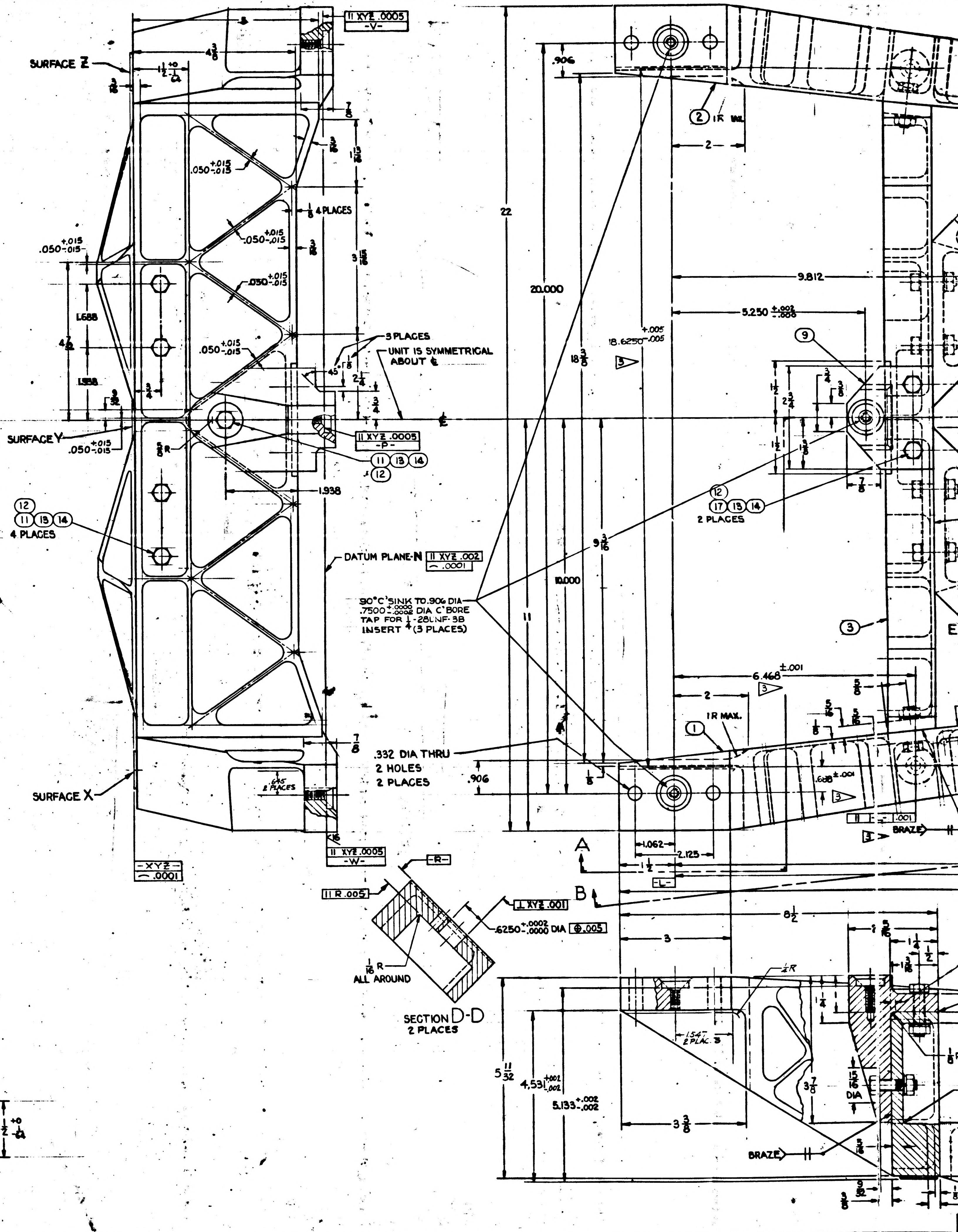
DETAIL OF ITEM ⑤

4


17 1/8
10 1/4
3 5/8 +0 -1/64
18 1/16
16 13/16
14 5/16
9 13/16
5 7/8
3 5/8
1.250
1.250
1.250
3/16
7/64
1 31/32
3 7/16
7
3/16
.050 +.015 -.015 8 PLACES
.050 +.015 -.015 4 PLACES
3/16
1 1/2 +0 -1/64
3/4
5/16
27/32
3/16
.050 +.015 -.015 3 PLACES
7 27/32
3 29/64
11 25/32
⑫ ⑪ ⑬ ⑭ 8-PLACES
⑫ ⑪ ⑬ ⑭ 8 PLACES

VIEW B-B

1899955


SURFACE Z
4 3/8
1 1/2 +0 -1/64
3/16
11 XYZ .0005 -V-
7/8
.050 +.015 -.015
3/8
13/16
1/8 4 PLACES
.050 +.015 -.015
3 15/16
.050 +.015 -.015
1.688
4 7/8
1.188
.050 +.015 -.015
3 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
45°
2 1/4
3/4
3/4
SURFACE Y
.050 +.015 -.015
5/8 R
11 XYZ .0005 -P-
⑪ ⑬ ⑭ ⑫
1.938
⑫ ⑪ ⑬ ⑭ 4 PLACES
DATUM PLANE-N 11 XYZ .002 .0001
90° C'SINK TO .906 DIA .7500 +.0000 -.0002 DIA C'BORE TAP FOR 1/4-28UNF-3B INSERT (3 PLACES)
.332 DIA THRU 2 HOLES 2 PLACES
SURFACE X
.906
7/8
45 2 PLACES
1/16
-XYZ- .0001
11 XYZ .0005 -W-
-R-
11 R .005
1 XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
1/16 R ALL AROUND
.906
22
20.000
18 3/8
18.6250 +.005 -.005
5
11
10.000
9 3/16
② 1 R
2
9.812
5.250 +.002 -.000
⑨
3/4
3/8
2 3/4
1 1/2
1 1/2
1 3/8
7/8
⑫ ⑰ ⑬ ⑭ 2 PLACES
③
6.468 ±.001
3
5/8
5/16
5/8
2
1 R MAX.
①
1/8
.688 ±.001
3
.001
BRAZE
1.062
1 1/2
2.125
-L-
A
B
8 1/2
3
1/16
1 1/4
3/16
1/4 R
1/4
.547 2 PLAC.
5 11/32
4.531 +.001 -.001
5.133 +.002 -.002
3 3/8
3 7/8
15/16 DIA
BRAZE
5/16
9/32
3/8

SECTION D-D 2 PLACES

INCHES PHOTOGRAPHIC SCALE ONLY

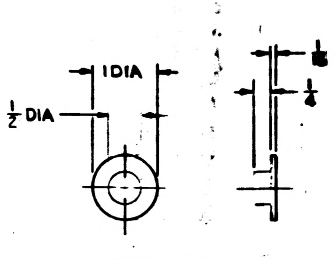
E-2

1. INTERPRET DRAWING IN ACCORDANCE WITH ~~MIL-D-70327~~

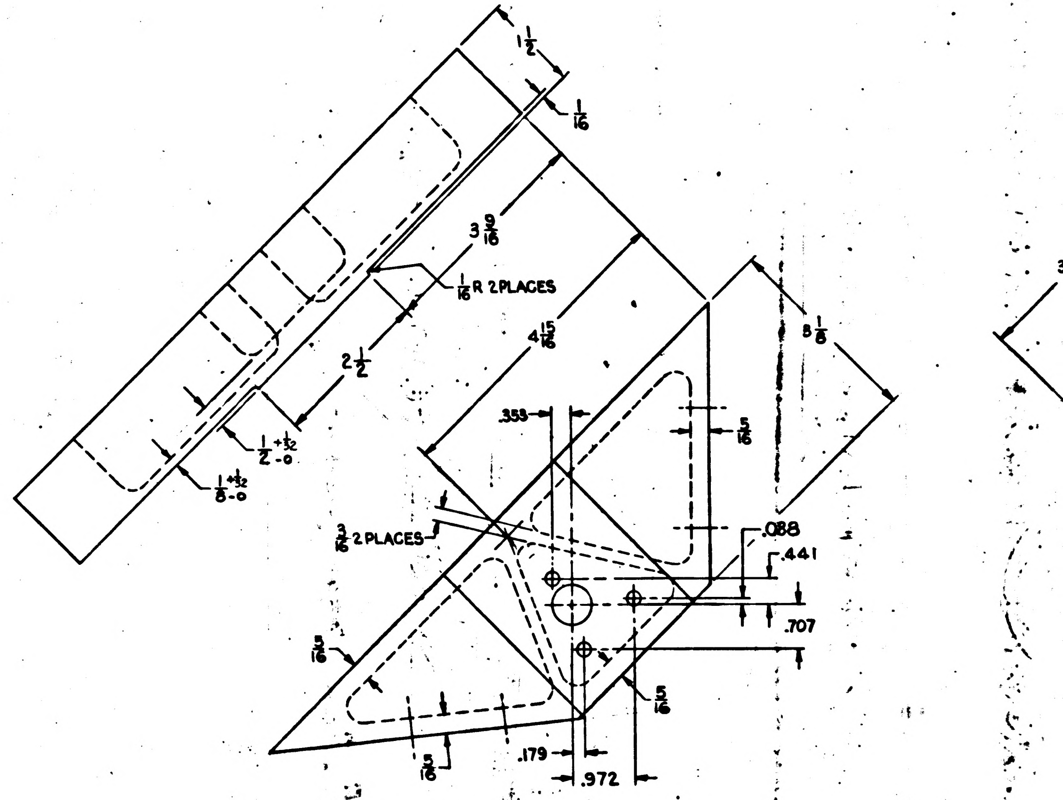
2. MATERIAL:
   - a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531
   - b. REFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 321, *CONDITION A.*
   - C. BRAZE MATERIAL - SILVER-LITHIUM PER ND 1002021.

3. REQUIREMENTS:
   - a. UNLESS OTHERWISE SPECIFIED:
     - 1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
     - 2. SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\surd}$
     - 3. ALL FILLETS $\frac{1}{4}$ R
     - 4. ALL WEB THICKNESS TO BE .100
     - 5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F
   - C. BRAZE PER ND1002020.

   - 2 d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 IN. LBS.
   - e. PLANE CONTAINING SURFACES R, S, T & U MUST BE PARALLEL WITH PLANE -XYZ- WITHIN .005.
   - f. SURFACES RST & U TO BE $\overset{32}{\surd}$AA
   - g. PRIOR TO ANY MACHINING & AFTER BRAZING, STABILIZE PER ND 1002022.
   - h. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES P V W.
   - i. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 $\frac{3}{4}$ REF DIMENSION.
   - 3 J. THESE TOLERANCE & PARALLELISM NOTES APPLY ONLY TO .2520 DIA. HOLE AND THE TOLERANCE FOR LOCATING ITEM 10 IS ± .015.
   - 4 K. THESE FRACTIONAL DIMENSIONS ARE TO BE INSPECTED PRIOR TO BRAZING.

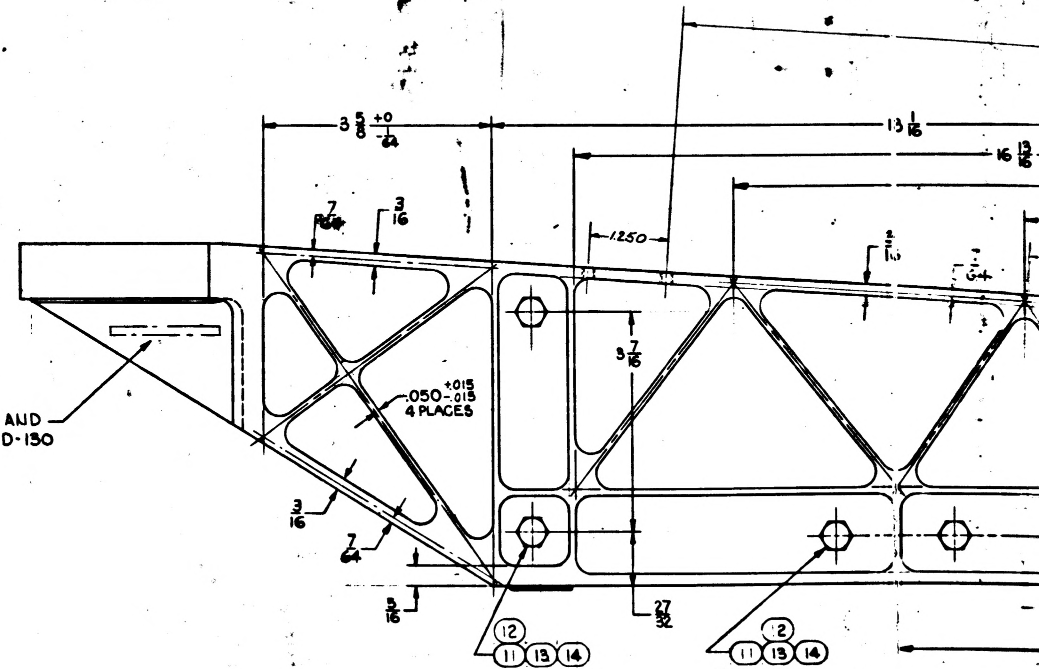

1 DIA
1/2 DIA
1/8
1/4

DETAIL OF ITEM ⑩


1 1/2
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
8 1/8
2 1/2
1/2 +1/32 -0
1/8 +1/32 -0
.355
5/16
3/16 2 PLACES
.088
.441
.707
5/16
5/16
5/16
.179
.972

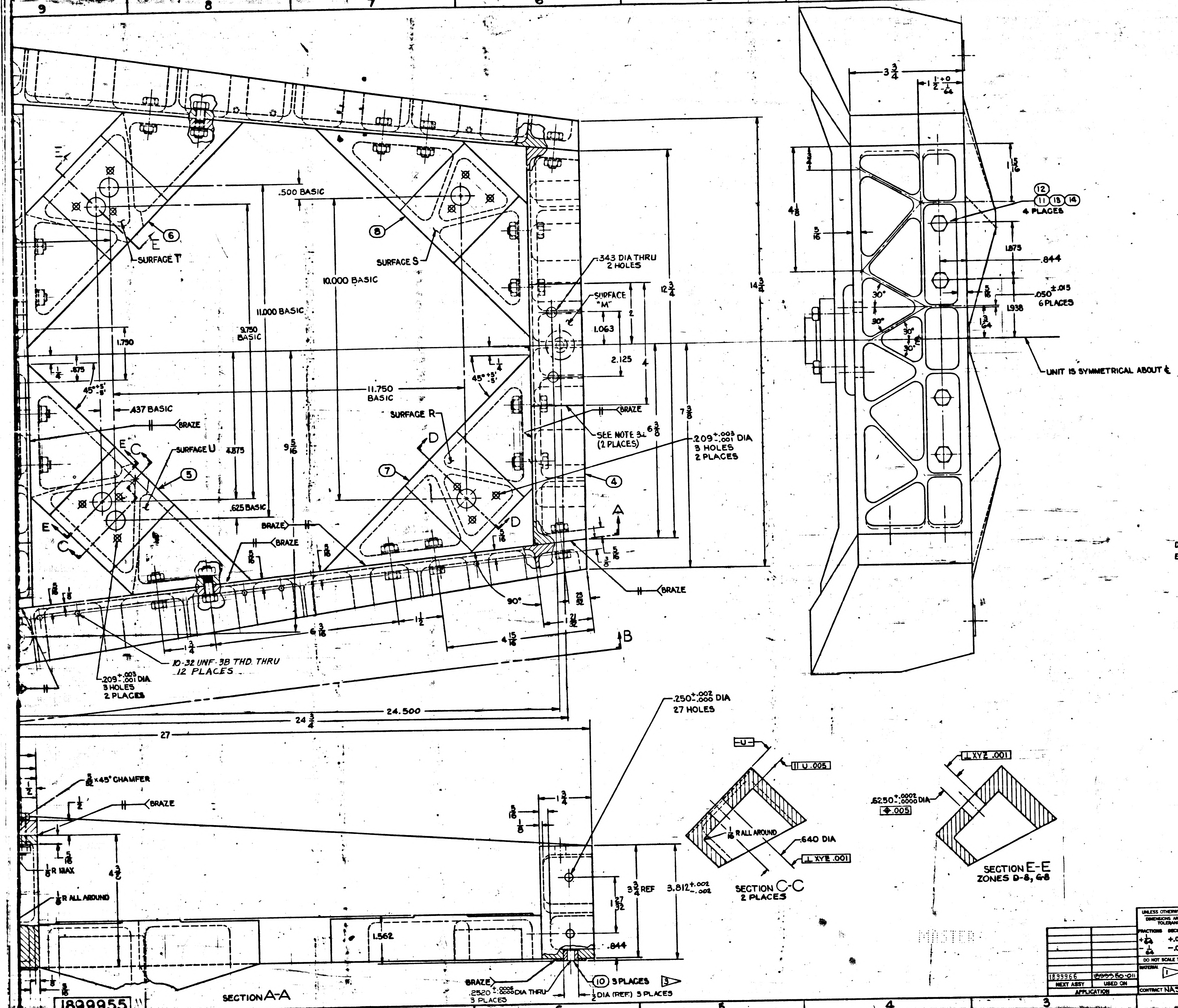
DETAIL OF ITEM ⑦

4


3 5/8 +0 -1/64
13 1/16
16 13/16
7/64 R
3/16
.1250
3/16
3/64
3 7/16
.050 +.015 -.015 4 PLACES
3/16
7/64
5/16
27/32
⑫ ⑪ ⑬ ⑭ 8-PLACES
⑫ ⑪ ⑬ ⑭ 8 PLACES

IDENTIFY USING DRAWING Nº AND REVISION LETTER PER MIL-STD-130

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
REVISIONS					
G		UPGRADED FOR TDRR 01023 CLASS A RELEASE		27 APR 63	LS
H		NOT USED		19 JULY 63	
J		REVISED IN ACCORDANCE WITH TDRR 01835		19 JULY 63	
K		REVISED IN ACCORDANCE WITH TDRR 01968		19 JULY 63	23 July 63
L	-	REVISED IN ACCORDANCE WITH TDRR 02309		31 Jul 63	R.W.G
M	-	REVISED PER TDRR NO. 03190		20 SEP 63	



.500 BASIC
SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE "M"
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
1.790
.875
45° +5' -5'
BRAZE
.343 DIA THRU 2 HOLES
1.063
2.125
12 3/4
14 3/4
6 3/8
7 3/8
9 5/16
SEE NOTE 3 (2 PLACES)
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU 12 PLACES
90°
1 1/2
1 3/4
4 15/16
6 3/16
24.500
24 3/4
27
A
B
C
D
E
3 3/4
1 1/2 +0 -1/64
4 1/8
1 5/16
1.875
.844
.050 ±.015 6 PLACES
1.938
30°
4 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
.250 +.002 -.000 DIA 27 HOLES
5/32 x 45° CHAMFER
1/8 R MAX
1/8 R ALL AROUND
3 3/4 REF
3.812 +.002 -.002
1 27/32
1.562
.844
.2520 +.0005 -.0000 DIA THRU 3 PLACES
1/2 DIA (REF) 3 PLACES
3 PLACES
SECTION A-A
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
∥ U .005
.6250 +.0002 -.0000 DIA
⊕ .005
⊥ XYZ .001
SECTION C-C 2 PLACES
SECTION E-E ZONES D-8, G-8

TDR No. 00167 DATE 12 DEC '62

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	2	MS 35308-009	SCREW-HEX HD
16			
15			
14	27	MS 35690-430	NUT-PLAIN HEX
13	27	MS 35338-082	WASHER-SPLIT LOCK
12	27	AN-960C416	WASHER-PLAIN
11	25	MS-35308-008	SCREW-HEX HD
10	3	-010	PAD-REFERENCE
9	1	-009	OPTICS SUPPORT-REAR
8	1	-008	IMU SUPPORT-RH REAR
7	1	-007	-LH REAR
6	1	-006	-RH FRONT
5	1	-005	-LH FRONT
4	1	-004	BRIDGE-BACK
3	1	-003	BRIDGE-FRONT
2	1	-002	ARM-RH
1	1	1899955-001	ARM-LH

LIST OF PARTS AND MATERIALS

MASTER

NEXT ASSY	USED ON
1899966	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER DATE 27 NOV 62
CHECKED 4 DEC 62
APPROVAL J. A. Hoern 4 DEC 62
APPROVAL 4 DEC 62
NASA APPROVAL W J Rhine 12-28-62
MIT APPROVAL WAK 12/Dec/62

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY. -
NAVIGATION BASE
(INSEP)

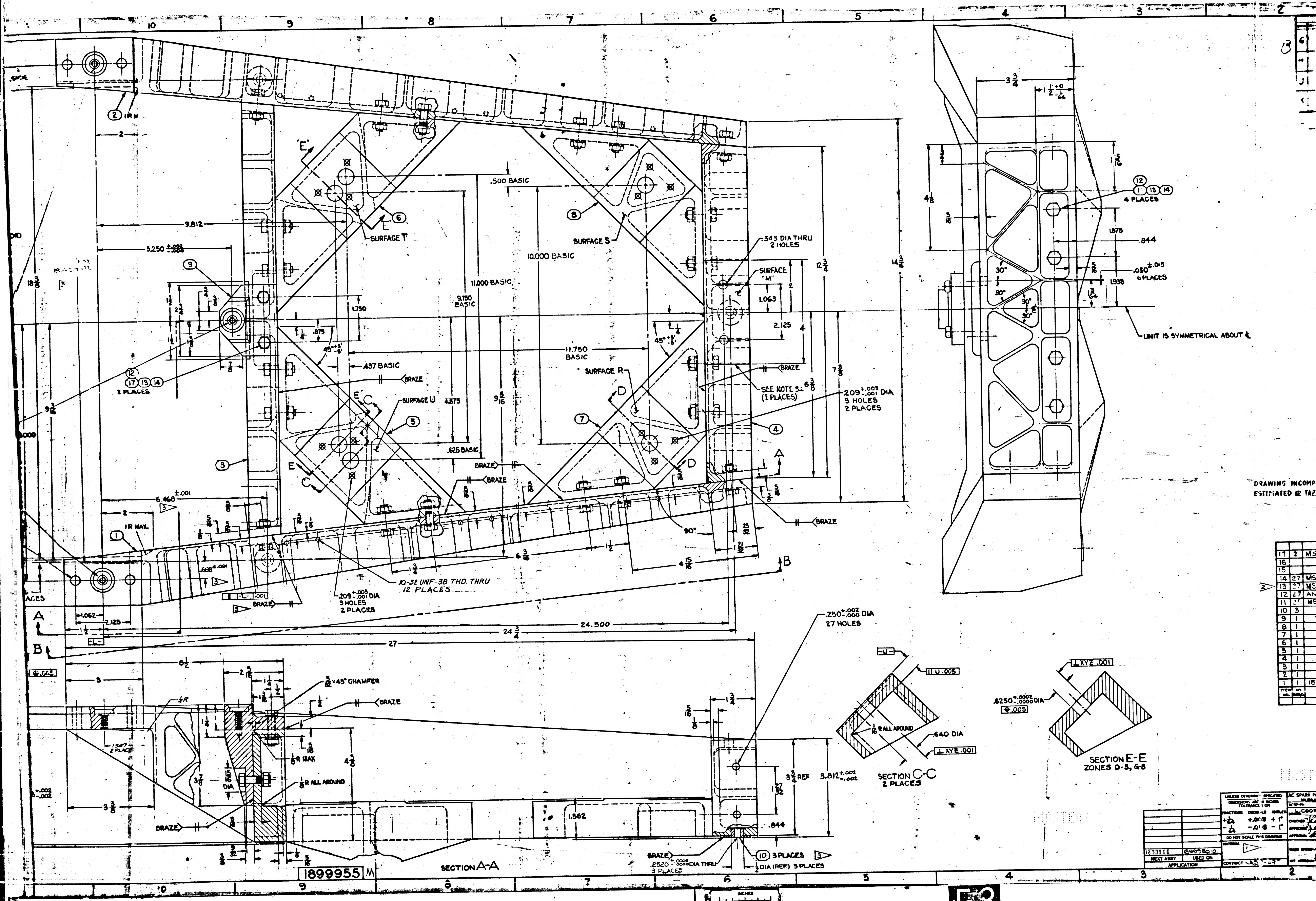
CODE IDENT NO.
SIZE J3
1899955
SCALE 1:1
SHEET

1899955

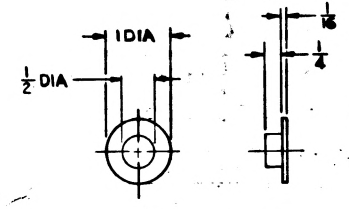
MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

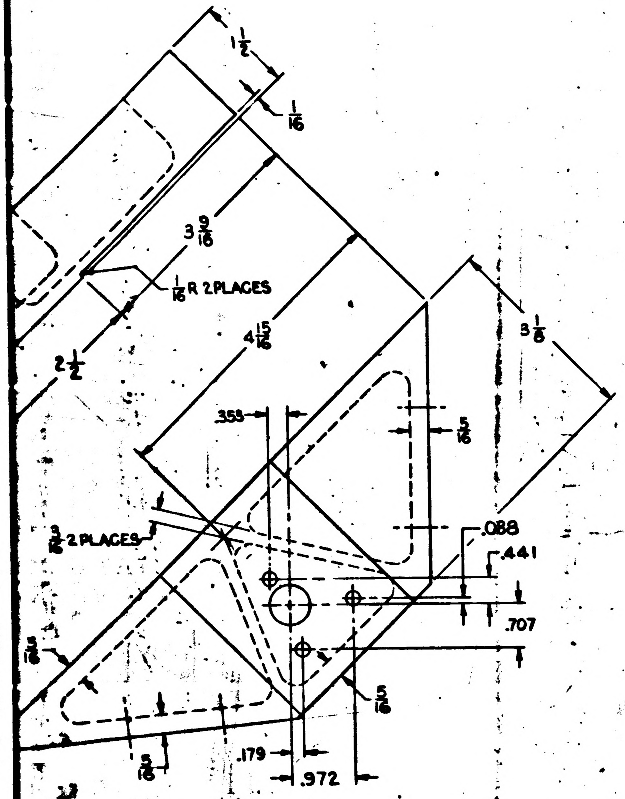
F-4


SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE "M"
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
9.812
5.250 +.002 -.003
6.460 ±.001
.688 ±.001
24.500
24 3/4
27
6 1/2
.343 DIA THRU 2 HOLES
SEE NOTE 3 (2 PLACES)
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU 12 PLACES
BRAZE
4 PLACES
2 PLACES
.050 ±.015 6 PLACES
1.938
UNIT IS SYMMETRICAL ABOUT ℄
.250 +.002 -.000 DIA 27 HOLES
.6250 +.0002 -.0000 DIA
.640 DIA
1/16 R ALL AROUND
⊥ XYZ .001
∥ U .005
SECTION C-C 2 PLACES
SECTION E-E ZONES D-5, G-8
5/32 x 45° CHAMFER
1/8 R MAX
1/8 R ALL AROUND
3 3/4 REF
3.812 +.002 -.002
.2520 +.0005 -.0000 DIA THRU 3 PLACES
⑩ 3 PLACES
1/2 DIA (REF) 3 PLACES
SECTION A-A
1899955 M
DRAWING INCOMP
ESTIMATED 12 TAP
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES +1° -1°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-29
1233966
1899550-0
NEXT ASSY
USED ON
APPLICATION
AC SPARK P
ACSP-PN
DRAWN COOP
CHECKED
APPROVED
APPROVAL
NASA APPROVAL
INCHES
PHOTOGRAPHIC SCALE ONLY
F-3

17	2	MS
16		
15		
14	27	MS
13	27	MS
12	27	AN
11	25	MS
10	3	
9	1	
8	1	
7	1	
6	1	
5	1	
4	1	
3	1	
2	1	
1	1	18
ITEM NO.	NO. REQD.	

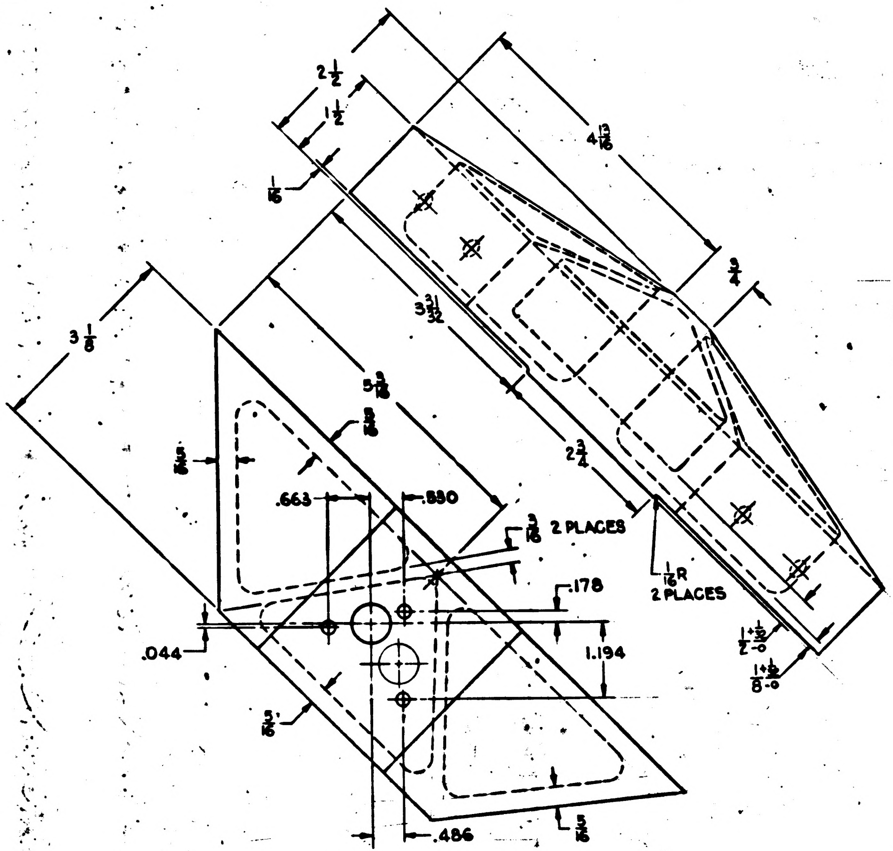

1 DIA
½ DIA
1/16
¼

DETAIL OF ITEM ⑩


1½
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
2½
3 ⅛
.355
5/16
3/16 2 PLACES
.088
.441
.707
5/16
.179
.972
5/16

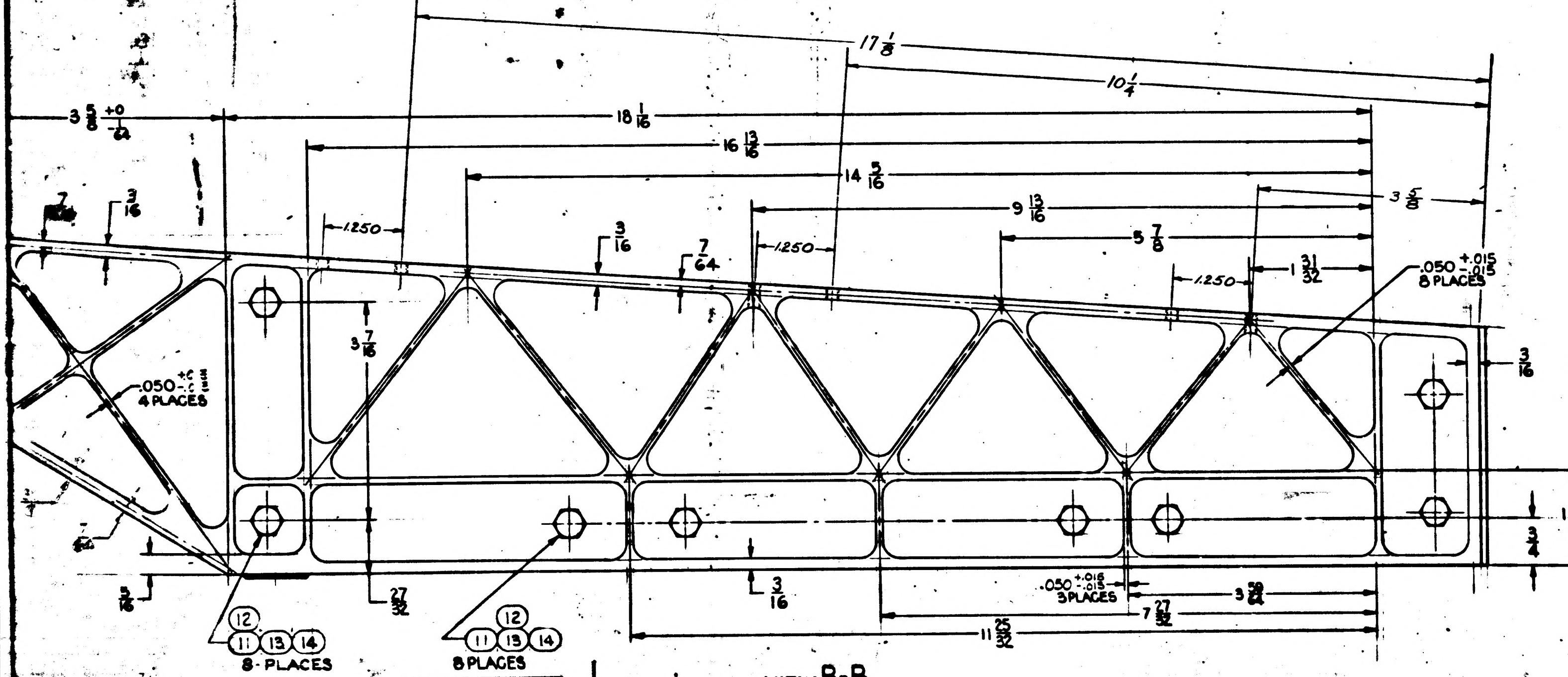
DETAIL OF ITEM ⑦

4

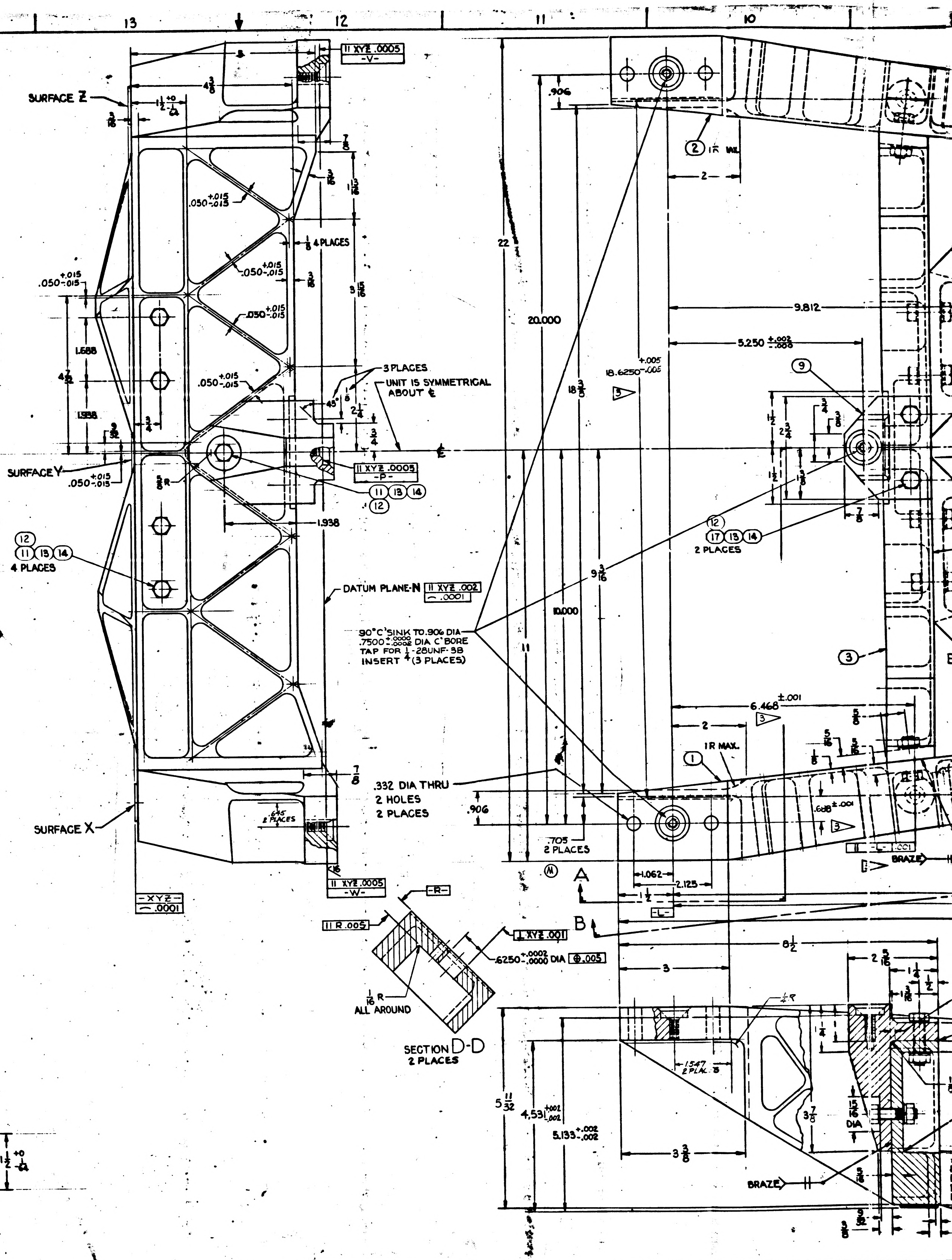

2½
1½
4 13/16
1/16
3 3/32
¾
3 ⅛
5 3/16
2¾
.663
.880
3/16 2 PLACES
1/16 R 2 PLACES
.178
1.194
.044
1 +½ -0
1 +½ -0
.486
5/16

DETAIL OF ITEM ⑤

4


17 ⅛
10 ¼
3 ⅝ +0 -1/64
18 1/16
16 13/16
14 5/16
9 13/16
5 ⅞
3 ⅝
3/16
1.250
1.250
1.250
7/64
1 31/32
.050 +.015 -.015 8 PLACES
3 7/16
.050 +.015 -.015 4 PLACES
3/16
1½ +0 -1/64
¾
5/16
27/32
3/16
.050 +.015 -.015 3 PLACES
7 27/32
3 59/64
11 25/32
⑫ ⑪ ⑬ ⑭ 8 PLACES
⑫ ⑪ ⑬ ⑭ 8 PLACES

VIEW B-B


11 XYZ .0005 -V-
SURFACE Z
4 ⅜
1½ +0 -1/64
3/16
⅞
3/16
1 13/16
.050 +.015 -.015
⅛ 4 PLACES
3/16
3 15/16
.050 +.015 -.015
.050 +.015 -.015
.050 +.015 -.015
.050 +.015 -.015
1.688
4 7/32
1.938
3/32
¾
3 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
45°
⅛
2¼
¾
SURFACE Y
.050 +.015 -.015
⅝ R
11 XYZ .0005 -P-
⑪ ⑬ ⑭ ⑫
1.938
⑫ ⑪ ⑬ ⑭ 4 PLACES
DATUM PLANE-N 11 XYZ .002 ⌒ .0001
90°C'SINK TO .906 DIA
.7500 +.0000 -.0002 DIA C'BORE
TAP FOR ¼-28UNF-3B
INSERT (3 PLACES)
⅞
.332 DIA THRU
2 HOLES
2 PLACES
.645 2 PLACES
SURFACE X
1/16
11 XYZ .0005 -W-
-XYZ- ⌒ .0001
-R-
11 R .005
1/16 R ALL AROUND
⊥ XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
SECTION D-D 2 PLACES
22
20.000
18 ⅜
18.6250 +.005 -.005
3
11
10.000
9 3/16
.906
.705 2 PLACES
Ⓜ A
B
9.812
5.250 +.002 -.000
⑨
② 1" TYP.
2
½
2¾
¾
⅜
1½
⅜
⅞
⑫ ⑰ ⑬ ⑭ 2 PLACES
③
6.468 ±.001
3
2
1 R MAX.
①
⅝
⅝
5/16
⅛
.688 ±.001
3
1.062
2.125
1⅛
-L-
BRAZE
8½
3
2 5/16
¼
½
1/16
⅛ R
1.547 2 PLAC. 3
¼
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 7/16
15/16 DIA
3 ⅜
BRAZE
3/16
⅜
5/32

1899955 M

INCHES
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH ~~MIL-B-70327~~

▷1 2. MATERIAL:

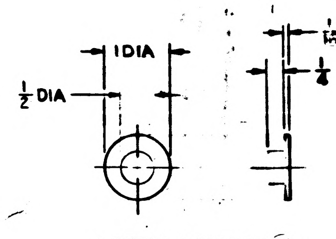
a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531
b. REFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 321, *CONDITION A.*
c. BRAZE MATERIAL - SILVER-LITHIUM PER ND 1002021.

3. REQUIREMENTS:

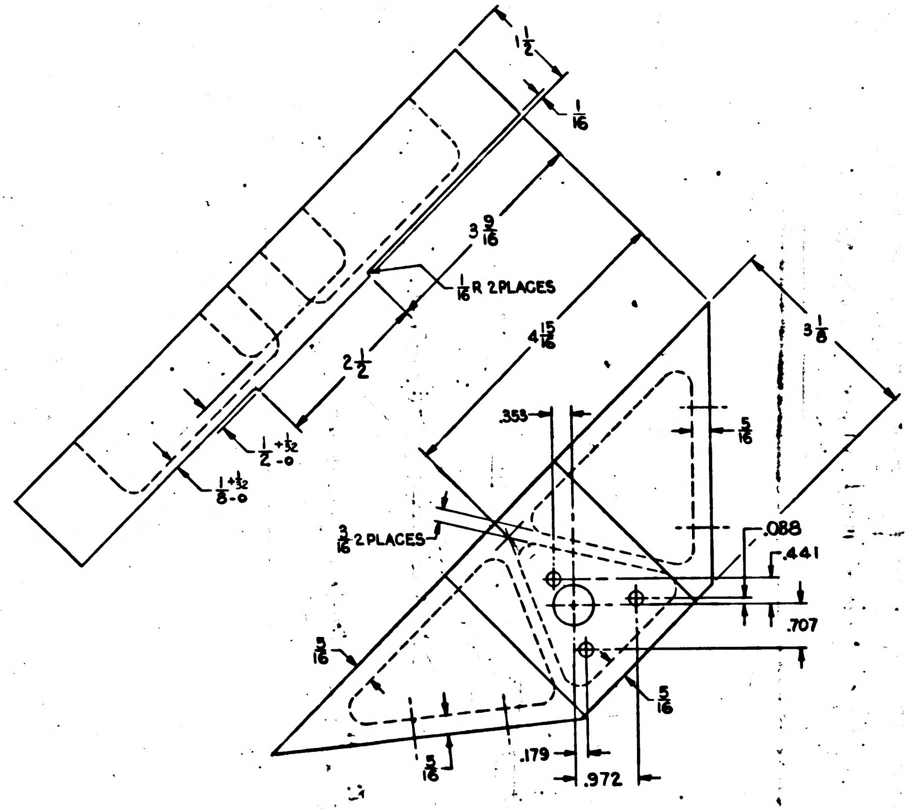
a. UNLESS OTHERWISE SPECIFIED:
1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
2. SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\vee}$
3. ALL FILLETS $\frac{1}{4}$ R
4. ALL WEB THICKNESS TO BE .100
5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F

c. BRAZE PER ND1002020.

▷2 d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 IN. LBS.
e. PLANE CONTAINING SURFACES R, S, T & U MUST BE PARALLEL WITH PLANE -XYZ- WITHIN .005.
f. SURFACES RST & U TO BE $\overset{32}{\vee}$AA
g. PRIOR TO ANY MACHINING & AFTER BRAZING, STABILIZE PER ND 1002022.
h. DATUM PLANE -N- IS DEFINED BY THE HIGH POINTS OF SURFACES P V W.
i. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW $3\frac{3}{4}$ REF DIMENSION.
▷3 j. THESE TOLERANCE & PARALLELISM NOTES APPLY ONLY TO .2520 DIA. HOLE AND THE TOLERANCE FOR LOCATING ITEM 10 IS ±.015.
▷4 k. THESE FRACTIONAL DIMENSIONS ARE TO BE INSPECTED PRIOR TO BRAZING.



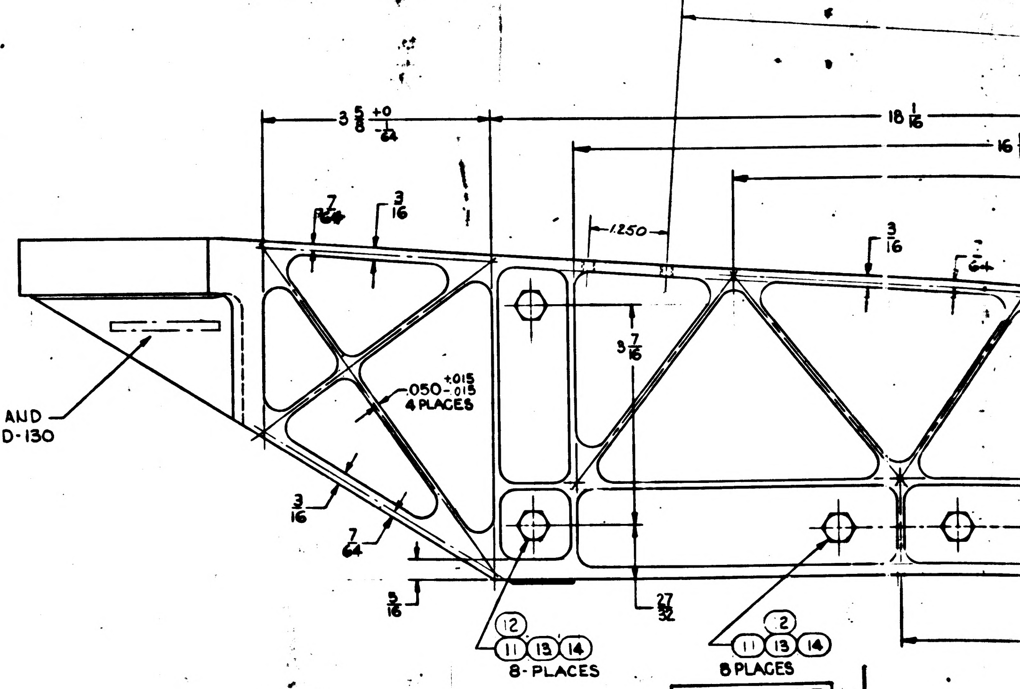
DETAIL OF ITEM ⑩



1/2
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
2 1/2
3 1/8
1 +1/32 -0
1 +1/32 -0
.355
5/16
3/16 2 PLACES
.088
.441
.707
5/16
5/16
5/16
.179
.972

DETAIL OF ITEM ⑦

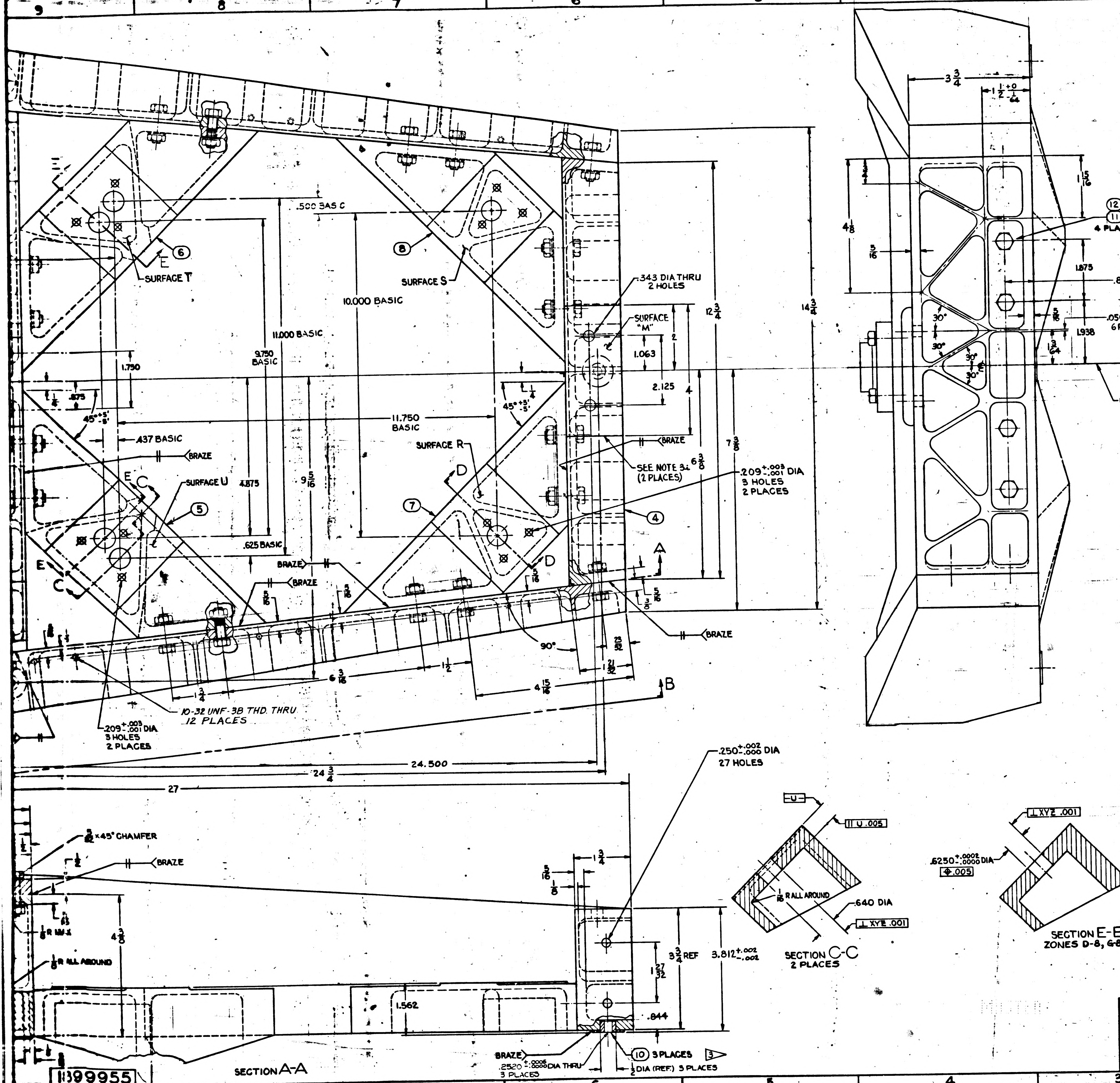
▷4



3 5/8 +0 -1/64
18 1/16
16
.1250
7/64
3/16
3/16
7/64
3 7/16
.050 +.015 -.015 4 PLACES
3/16
7/64
3/16
27/32
12
11 13 14
8-PLACES
2
11 13 14
8 PLACES

IDENTIFY USING DRAWING Nº AND REVISION LETTER PER MIL-STD-130

1899955


.500 BAS C
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
9 5/16
1.750
.875
45° +5' -5'
SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE "M"
BRAZE
.343 DIA THRU 2 HOLES
1.063
2.125
12 3/4
14 3/4
7 3/8
6 3/8
SEE NOTE 3 (2 PLACES)
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU 12 PLACES
90°
6 3/16
4 15/16
24.500
24 3/4
27
.250 +.002 -.000 DIA 27 HOLES
1/8 x 45° CHAMFER
1/8 R ALL AROUND
4 3/8
1.562
3.812 +.002 -.002
3 3/4 REF
1 27/32
.844
BRAZE
.2520 +.0005 -.0000 DIA THRU 3 PLACES
10 3 PLACES
DIA (REF) 3 PLACES
SECTION A-A
UNIT IS SYMMETRICAL ABOUT ℄
4 PLACES
1.875
.844
.050 ±.015 6 PLACES
1.938
30°
3 3/4
4 1/8
1 15/16
U
∥ U .005
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION E-E ZONES D-8, G-8
1899955
INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APP'D
G		UPGRADED FOR TDRR 01025 CLASS A RELEASE		27 APR 63	LS
H		NOT USED		19 JULY 63	
J		REVISED IN ACCORDANCE WITH TDRR 01835			
K		REVISED IN ACCORDANCE WITH TDRR 01968			
L		REVISED IN ACCORDANCE WITH TDRR 02309			
M		REVISED PER TDRR NO. 03190			
N₂		REVISED PER TDRR NO. 03672			

TDR No. 00 167 DATE 12 DEC '62

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO.	NO. REQ'D.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	2	MS 35308-009	SCREW-HEX HD
16			
15			
14	27	MS 35690-430	NUT-PLAIN HEX
13	27	MS 35338-082	WASHER-SPLIT LOCK
12	27	AN-960C416	WASHER-PLAIN
11	25	MS-35308-008	SCREW-HEX HD
10	3	-010	PAD-REFERENCE
9	1	-009	OPTICS SUPPORT-REAR
8	1	-008	IMU SUPPORT-RH REAR
7	1	-007	-LH REAR
6	1	-006	-RH FRONT
5	1	-005	-LH FRONT
4	1	-004	BRIDGE-BACK
3	1	-003	BRIDGE-FRONT
2	1	-002	ARM-RH
1	1	1899955-001	ARM-LH

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899966	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER DATE 27 NOV 62
CHECKED 4 DEC 62
APPROVAL J. E. Hanna 4 DEC 62
APPROVAL 4 DEC 62
NASA APPROVAL 12-2-62
MIT APPROVAL 12/Dec 62

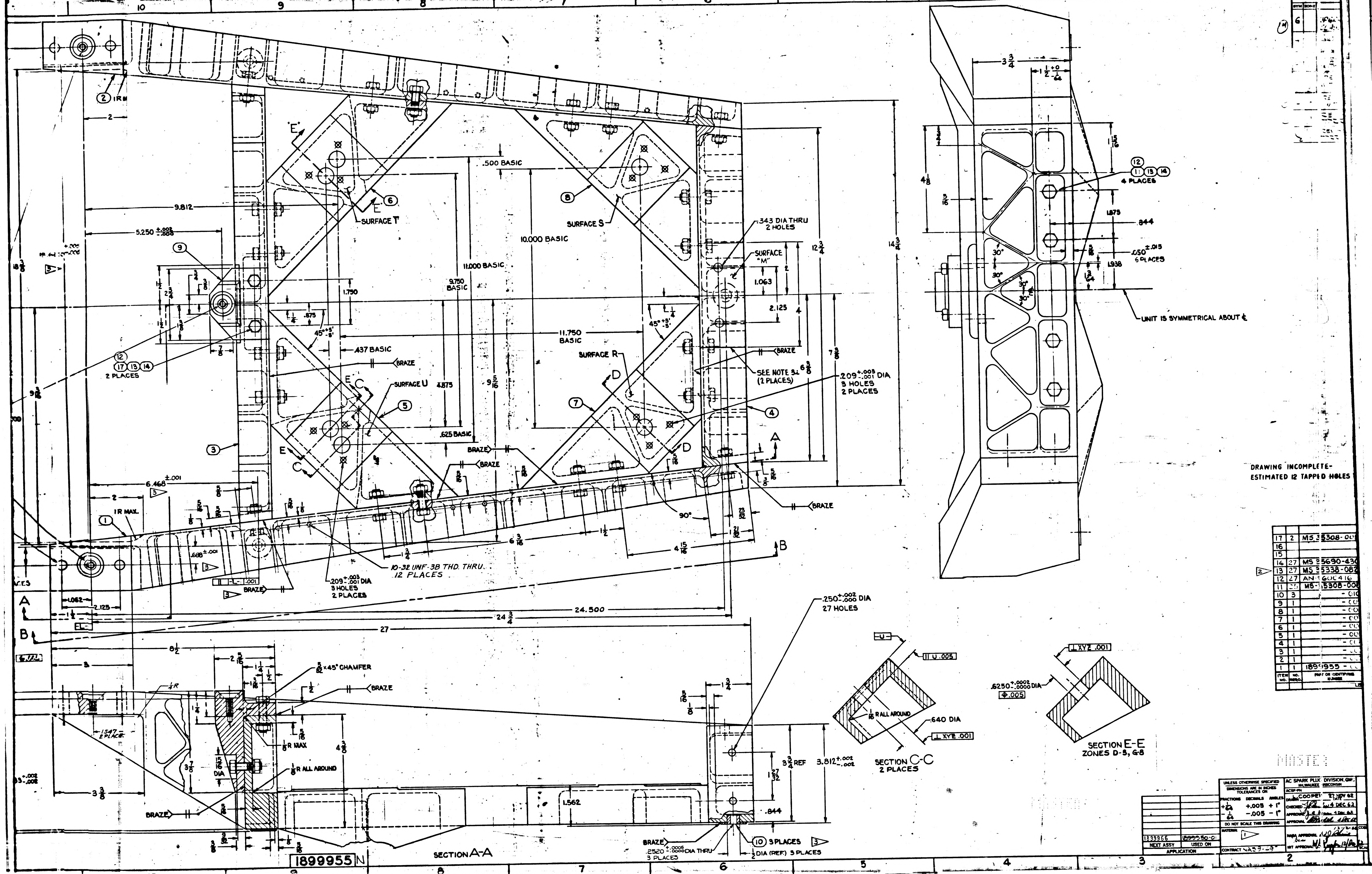
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY. -
NAVIGATION BASE
(INSEP)

CODE IDENT NO. SIZE J3 1899955
SCALE 1:1 SHEET

1899955

F-4



SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE "M"
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
9.812
5.250 +.002 -.000
6.468 ±.001
.688 ±.001
.343 DIA THRU 2 HOLES
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU. 12 PLACES
SEE NOTE 3 (2 PLACES)
45° +5' -5'
90°
BRAZE
1R MAX.
24.500
24 3/4
27
8 1/2
UNIT IS SYMMETRICAL ABOUT ℄
4 PLACES
.050 ±.015 6 PLACES
.844
1.875
1.938
.250 +.002 -.000 DIA 27 HOLES
.640 DIA
⊥ XYZ .001
∥ U .005
R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
SECTION E-E ZONES D-5, G-8
3/32 x 45° CHAMFER
1/8 R MAX
1/8 R ALL AROUND
15/16 DIA
3.812 +.002 -.002
3 3/4 REF
.2520 +.0005 -.0000 DIA THRU 3 PLACES
1/2 DIA (REF) 3 PLACES
3 PLACES
SECTION A-A
1899955 N
DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES
MASTER
INCHES
PHOTOGRAPHIC SCALE ONLY

ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER
17	2	MS 35308-00
16		
15		
14	27	MS 35690-43
13	27	MS 35338-082
12	27	AN 960C416
11	25	MS 35308-00
10	3	-01
9	1	-00
8	1	-00
7	1	-00
6	1	-00
5	1	-00
4	1	-00
3	1	-
2	1	-
1	1	1899955 -

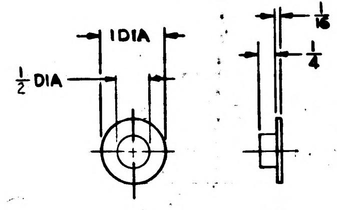
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS +.005 -.005 ANGLES + 1° - 1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS 9-29

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER 27 NOV 62
CHECKED 4 DEC 62
APPROVAL 4 DEC 62
APPROVAL 4 DEC 62
NASA APPROVAL 12-12-62
MIT APPROVAL 12/DEC 62

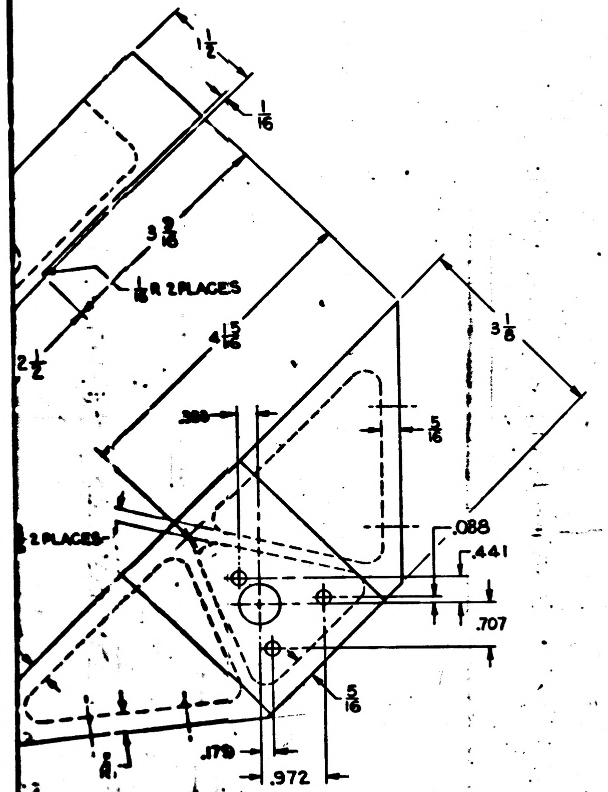
NEXT ASSY	USED ON
1899966	1899950-01

APPLICATION

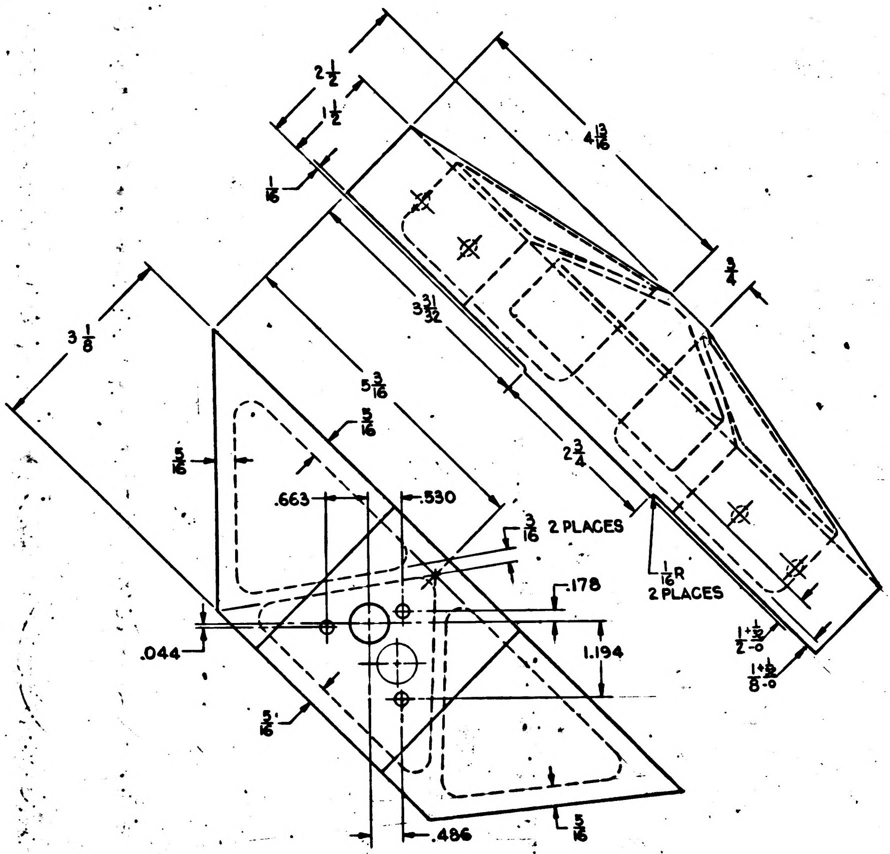
E-3


1 DIA
1/2 DIA
1/16
1/4

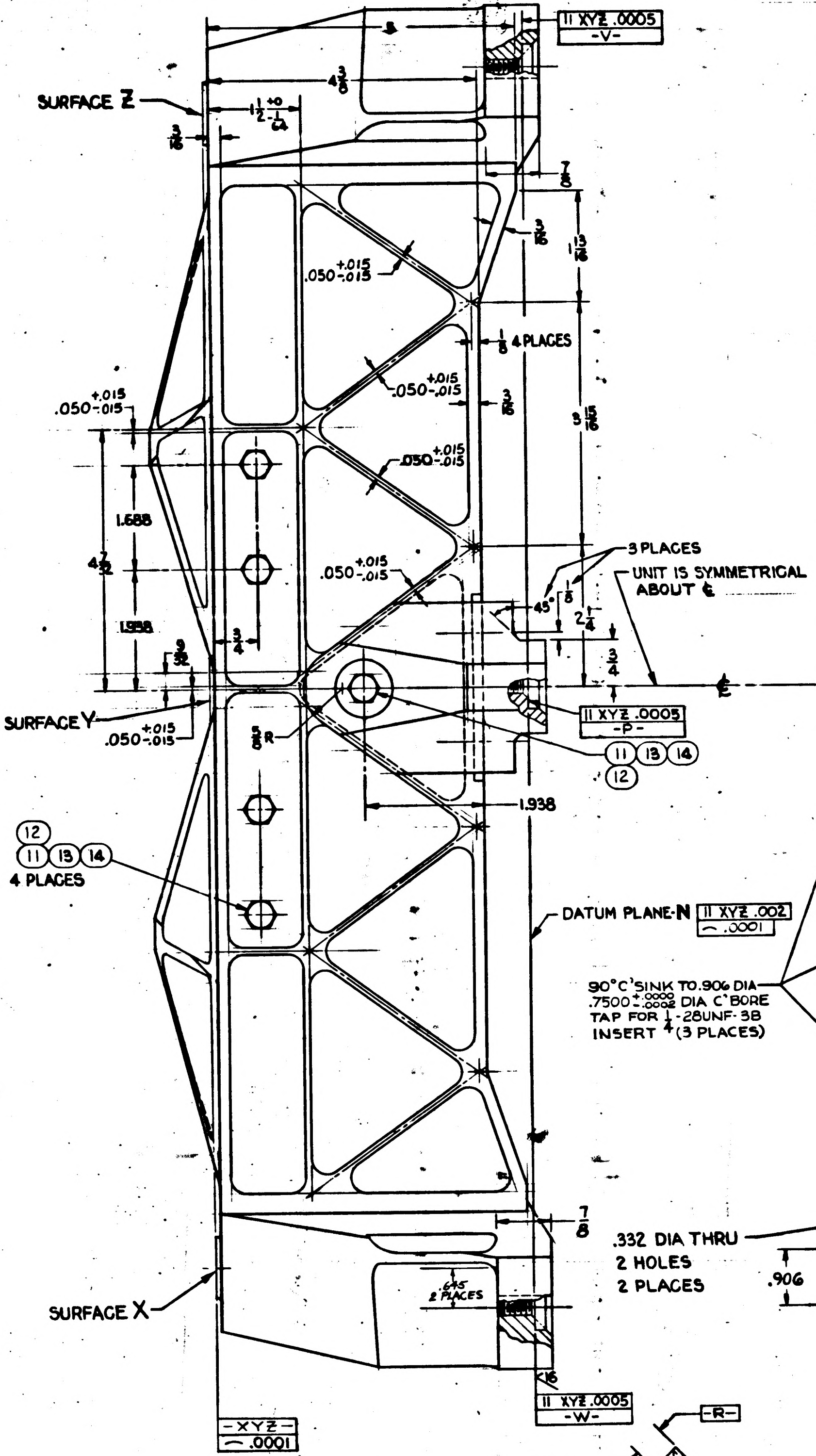
DETAIL OF ITEM ⑩

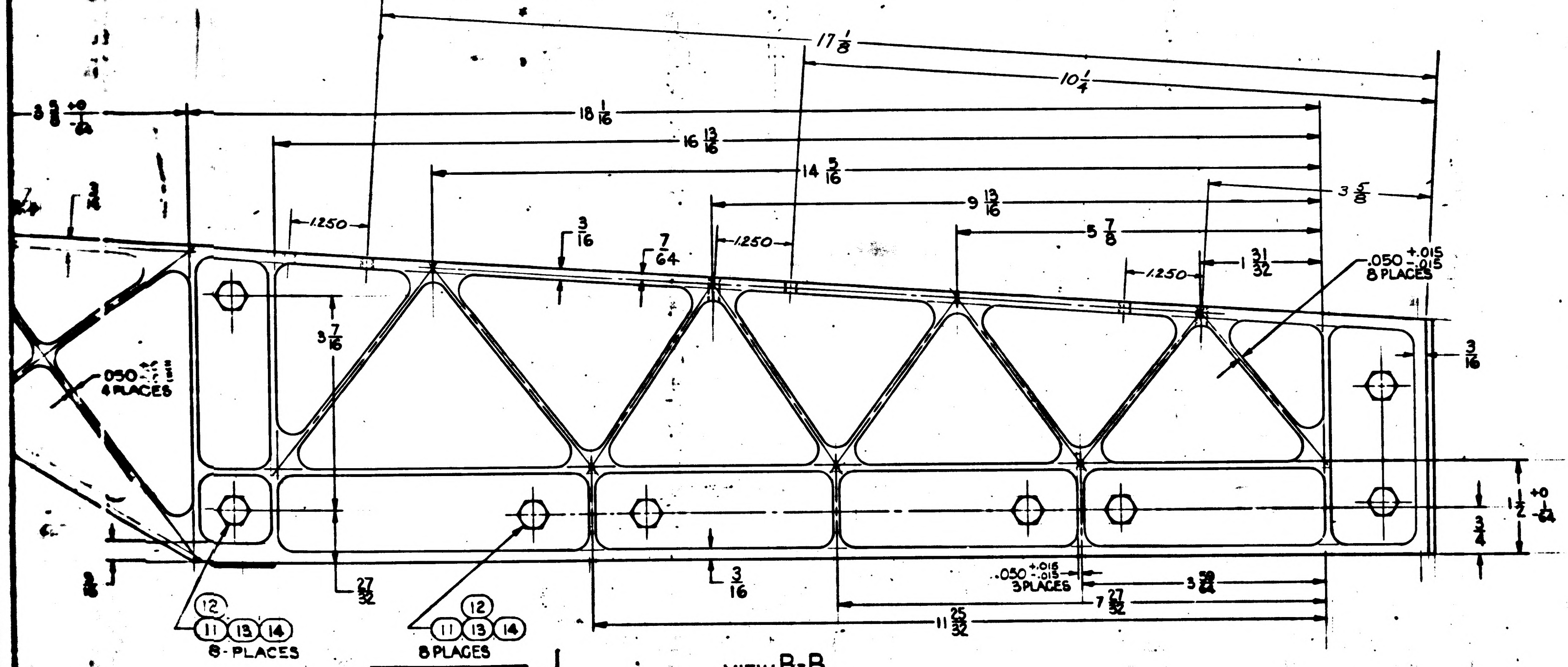

1 1/2
1/16
3 3/16
1/8 R 2 PLACES
4 15/16
2 1/2
3 1/8
.388
5/16
2 PLACES
.088
.441
.707
5/16
.179
.972

DETAIL OF ITEM ⑦ 4

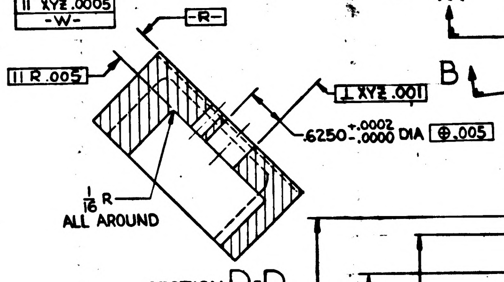

2 1/2
1 1/2
4 13/16
1/16
3 1/8
3 31/32
3/4
5 3/16
5/16
5/16
.663
.530
2 3/4
3/16 2 PLACES
1/16 R 2 PLACES
.178
1 1/32 +0 -0
1 1/2 +0 -0
1.194
.044
5/16
.486
5/16

DETAIL OF ITEM ⑤ 4

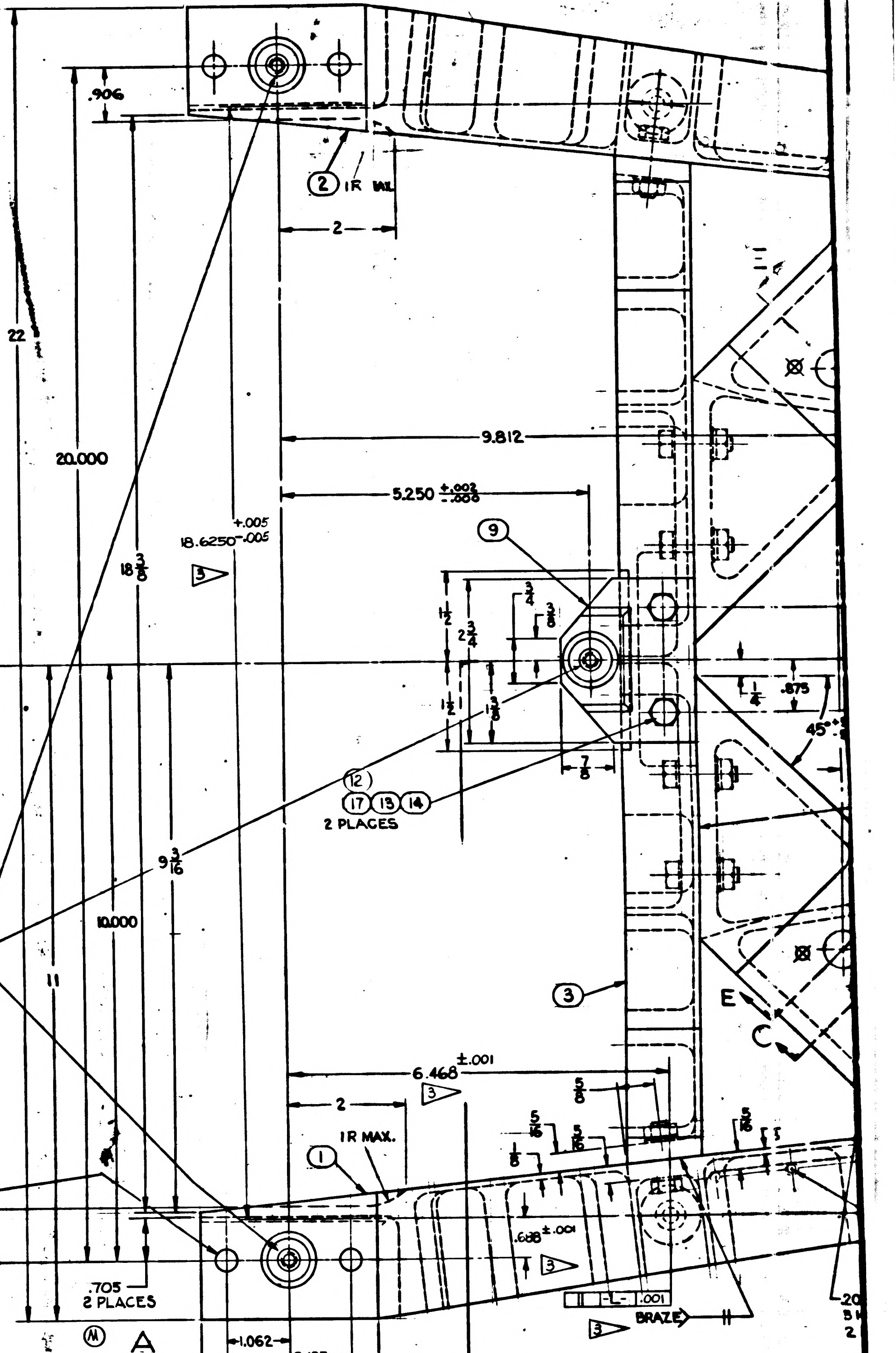

SURFACE Z
11 XYZ .0005 -V-
4 3/8
1 1/2 +0 -1/64
3/16
7/8
3/16
13/16
1/8 4 PLACES
.050 +.015 -.015
3/16
3 15/16
1.688
4 1/2
1.938
3/4
3/32
3 PLACES
45°
UNIT IS SYMMETRICAL ABOUT ℄
2 1/4
3/4
SURFACE Y
5/8 R
11 XYZ .0005 -P-
⑪ ⑬ ⑭ ⑫
1.938
⑫ ⑪ ⑬ ⑭ 4 PLACES
DATUM PLANE-N 11 XYZ .002 ⌒ .0001
90°C'SINK TO .906 DIA .7500 +.0000 -.0002 DIA C'BORE TAP FOR 1/4-28UNF-3B INSERT (3 PLACES)
7/8
SURFACE X
5/16 2 PLACES
1/16
11 XYZ .0005 -W-
-XYZ- ⌒ .0001
.332 DIA THRU 2 HOLES 2 PLACES


17 1/8
10 1/4
3 3/8 +0 -1/64
18 1/16
16 13/16
14 5/16
9 13/16
3 5/8
5 7/8
1.250
3/16
7/64
1.250
1.250
1 31/32
.050 +.015 -.015 8 PLACES
3/16
3 7/16
.050 +.015 -.015 4 PLACES
3/16
1 1/2 +0 -1/64
3/4
27/32
3/16
.050 +.015 -.015 3 PLACES
7 27/32
3 59/64
11 25/32
3/16
⑫ ⑪ ⑬ ⑭ 8 PLACES
⑫ ⑪ ⑬ ⑭ 8 PLACES

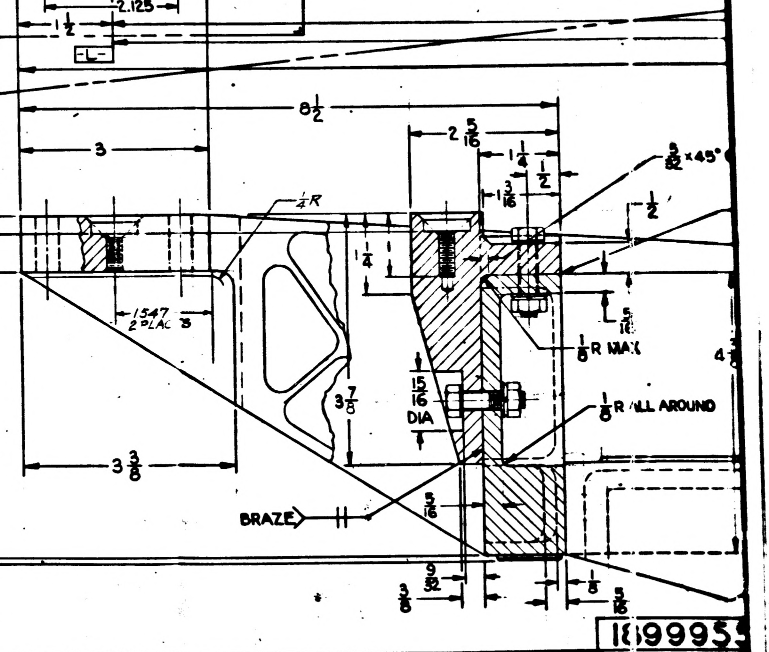
VIEW B-B


-R-
11 R .005
1 XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
1/16 R ALL AROUND

SECTION D-D 2 PLACES


.906
② 1 R MAX
2
22
20.000
9.812
5.250 +.002 -.000
18.6250 +.005 -.005 3
18 3/8
⑨
1/2
2 3/4
3/4
3/8
1/2
1 3/8
1/4
.875
45°
⑫ ⑰ ⑬ ⑭ 2 PLACES
7/8
9 3/16
10.000
11
③
E
6.468 ±.001 3
2
① 1 R MAX.
5/8
5/16
5/16
.688 ±.001 3
.906
.705 2 PLACES
11 -L- .001
3 BRAZE

A B


1.062
2.125
1 1/2
-L-
8 1/2
3
2 5/16
1 1/4
1/2
3/32 x 45°
1 3/8
1/4
1/8 R
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
1.547 2 PLAC 3
3 7/8
3 3/8
15/16 DIA
1/8 R MAX
1/8 R ALL AROUND
BRAZE
5/16
9/32
3/8
1/8
5/16
4 3/

INCHES
PHOTOGRAPHIC SCALE ONLY

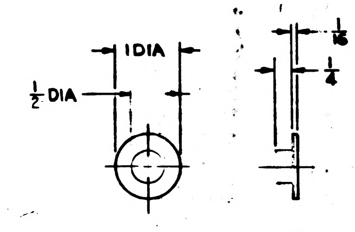
F-2

1. INTERPRET DRAWING IN ACCORDANCE WITH ~~MIL-B-70327~~

▷1 2. MATERIAL:
   a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531
   b. REFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A.
   C. BRAZE MATERIAL - SILVER-LITHIUM PER ND 1002021.

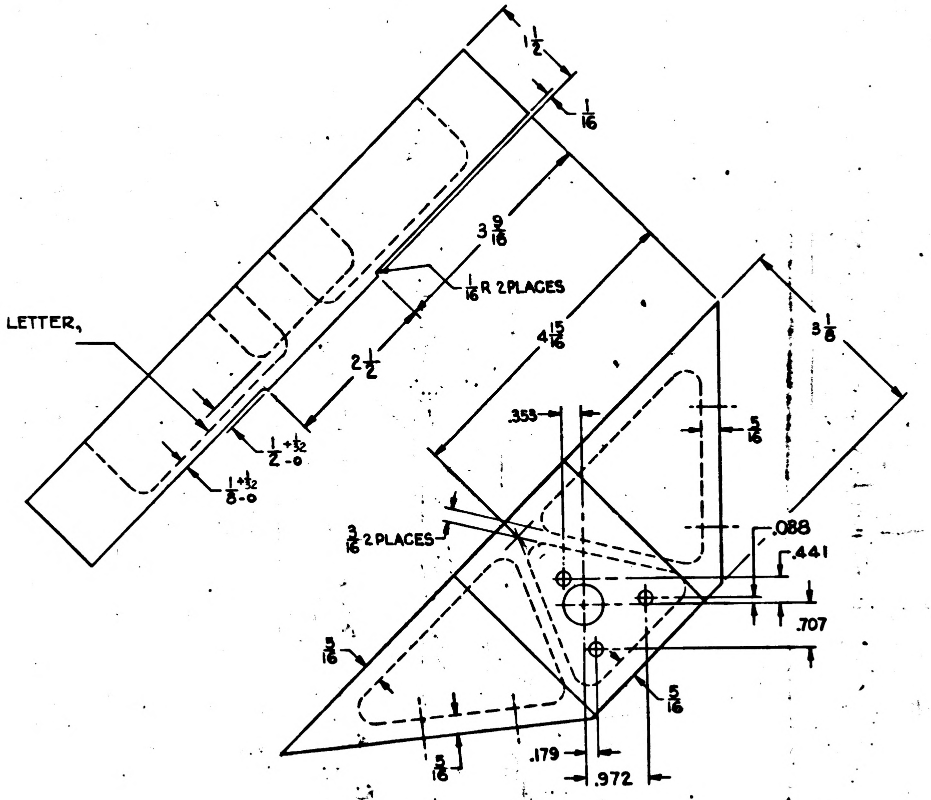
3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED 63/▽
      3. ALL FILLETS $\frac{1}{4}$ R
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F
   C. BRAZE PER ND1002020.

▷2 d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 IN. LBS.
   e. PLANE CONTAINING SURFACES R, S, T & U MUST BE PARALLEL WITH PLANE -XYZ- WITHIN .005.
   f. SURFACES RST & U TO BE 32/▽AA
   g. PRIOR TO ANY MACHINING & AFTER BRAZING, STABILIZE PER ND 1002022.
   h. DATUM PLANE -N IS DEFINED BY THE HIGH POINTS OF SURFACES P V W.
   i. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 $\frac{3}{4}$ REF DIMENSION.
▷3 J. THESE TOLERANCE & PARALLELISM NOTES APPLY ONLY TO .2520 DIA. HOLE AND THE TOLERANCE FOR LOCATING ITEM 10 IS ± .015.
▷4 K. THESE FRACTIONAL DIMENSIONS ARE TO BE INSPECTED PRIOR TO BRAZING.


1 DIA
$\frac{1}{2}$ DIA
$\frac{1}{16}$
$\frac{1}{4}$

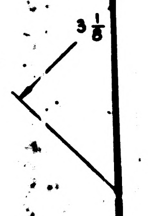
DETAIL OF ITEM ⑩

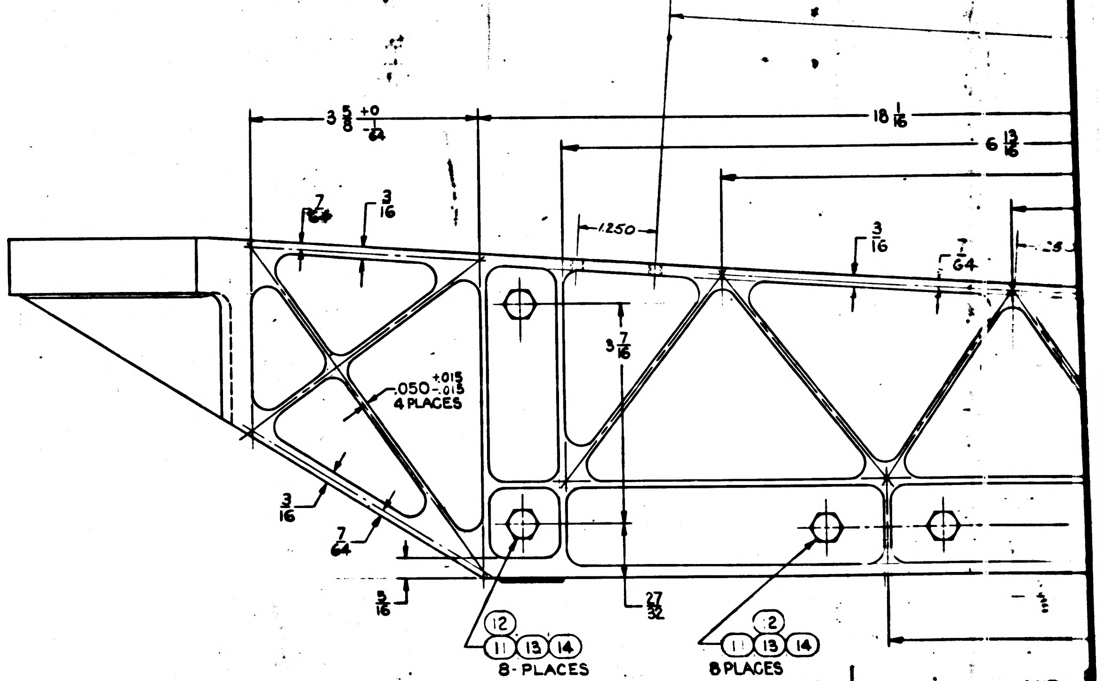
IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND 1002023.


$1\frac{1}{2}$
$\frac{1}{16}$
$3\frac{9}{16}$
$\frac{1}{16}$ R 2 PLACES
$4\frac{15}{16}$
$2\frac{1}{2}$
$\frac{1}{2}{}^{+1/32}_{-0}$
$\frac{1}{8}{}^{+1/32}_{-0}$
$3\frac{1}{8}$
.353
$\frac{5}{16}$
$\frac{3}{16}$ 2 PLACES
.088
.441
.707
$\frac{5}{16}$
$\frac{5}{16}$
$\frac{5}{16}$
.179
.972

DETAIL OF ITEM ⑦

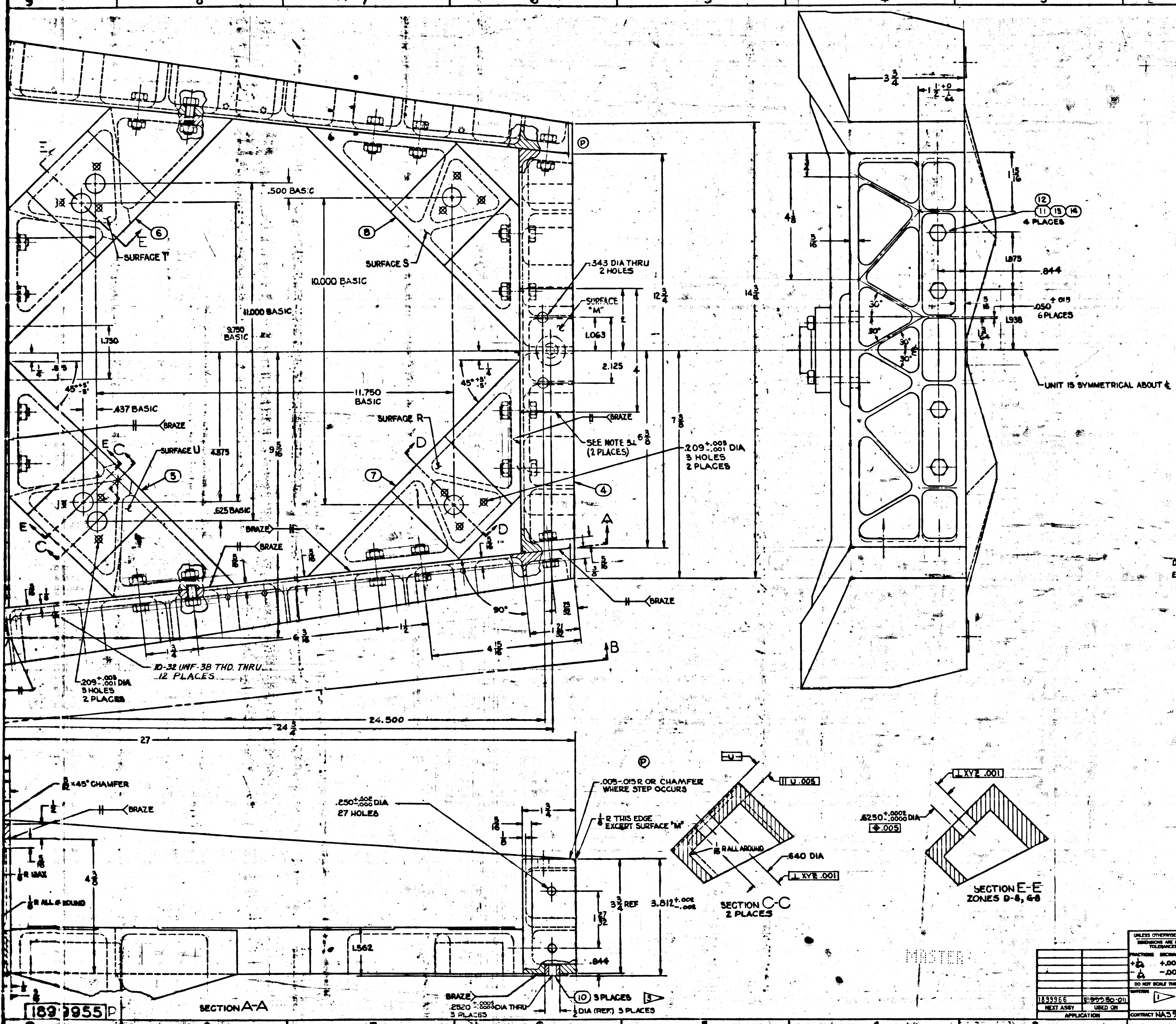
▷4




$3\frac{5}{8}{}^{+0}_{-1/64}$
$18\frac{1}{16}$
$6\frac{13}{16}$
1.250
$\frac{7}{64}$
$\frac{3}{16}$
$\frac{3}{16}$
$\frac{7}{64}$
.25
$3\frac{7}{16}$
$.050^{+.015}_{-.015}$ 4 PLACES
$\frac{3}{16}$
$\frac{7}{64}$
$\frac{5}{16}$
$\frac{27}{32}$
⑫ ⑪ ⑬ ⑭ 8-PLACES
⑫ ⑪ ⑬ ⑭ 8 PLACES
VIEW

1899955

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
ⓜ G		UPGRADED FOR TDRR01093 CLASS A RELEASE		27 APR 63	LS
H		NOT USED		19 JULY 63	
J		REVISED IN ACCORDANCE WITH TDRR 01835		19 JULY 63	
K		REVISED IN ACCORDANCE WITH TDRR 01968		19 JULY 63	23 July 63
ⓜ L	-	REVISED IN ACCORDANCE WITH TDRR 02305		31 July 63	RWG
ⓜ M	-	REVISED PER TDRR NO. 03190		26 SEP 63	
Ⓒ N2		REVISED PER TDRR NO. 03672		21 OCT 63	
P		REVISED PER TDRR NO. 04818		2 DEC 63	



Ⓟ
E
SURFACE T
⑥
⑧
SURFACE S
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
1.750
1/4 .85
45° +5' -5'
.437 BASIC
11.750 BASIC
BRAZE
SURFACE R
SURFACE U
4.875
9 5/16
.625 BASIC
⑤
⑦
D
E C
J
.343 DIA THRU 2 HOLES
SURFACE "M"
1.063
2
2.125
4
12 3/4
6 3/8
7 3/8
14 3/4
SEE NOTE 3 (2 PLACES)
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
④
A
B
90°
23/32
21/32
1 1/2
6 3/16
1 3/4
4 15/16
5/16
3/8
10-32 UNF-3B THD. THRU 12 PLACES
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
24.500
24 3/4
27
3 3/4
1 1/2 +0 -1/64
1 15/16
4 3/8
5/16
30°
⑫ ⑪ ⑬ ⑭ 4 PLACES
1.875
.844
.050 +.015 6 PLACES
1.938
5/16
1 3/64
UNIT IS SYMMETRICAL ABOUT ℄
5/8 x45° CHAMFER
1/2
5/16
1/8 R MAX
4 3/8
1/8 R ALL AROUND
.250 +.002 -.000 DIA 27 HOLES
.005-.015 R OR CHAMFER WHERE STEP OCCURS
1/8 R THIS EDGE EXCEPT SURFACE "M"
1 3/4
1/8
1 27/32
3 3/4 REF
3.812 +.002 -.002
1.562
.844
BRAZE
.2520 +.0004 -.0000 DIA THRU 3 PLACES
⑩ 3 PLACES
3
1/2 DIA (REF.) 3 PLACES
SECTION A-A
U
∥ U .005
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
SECTION C-C 2 PLACES
⊥ XYZ .001
.6250 +.0002 -.0000 DIA
⌖ .005
SECTION E-E ZONES D-8, G-8

TDR No. 00167 DATE 12 DEC '62

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	2	MS 35308-009	SCREW-HEX HD
16			
15			
14	27	MS 35690-430	NUT-PLAIN HEX
13	27	MS 35338-082	WASHER-SPLIT LOCK
12	27	AN-960C416	WASHER-PLAIN
11	25	MS-35308-008	SCREW-HEX HD
10	3	-010	PAD-REFERENCE
9	1	-009	OPTICS SUPPORT-REAR
8	1	-008	IMU SUPPORT-RH REAR
7	1	-007	-LH REAR
6	1	-006	-RH FRONT
5	1	-005	-LH FRONT
4	1	-004	BRIDGE-BACK
3	1	-003	BRIDGE-FRONT
2	1	-002	ARM-RH
1	1	1899955-001	ARM-LH

LIST OF PARTS AND MATERIALS

2 ▷ (item 13)

MASTER

NEXT ASSY	USED ON
1899966	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES +1° -1°
DO NOT SCALE THIS DRAWING
MATERIAL 1 ▷
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN
DRAWN L. COOPER DATE 27 NOV 62
CHECKED 4 DEC 62
APPROVAL J. A. 4 Dec 62
APPROVAL 4 DEC 62
NASA APPROVAL 12-2-63
MIT APPROVAL 12/Dec 63

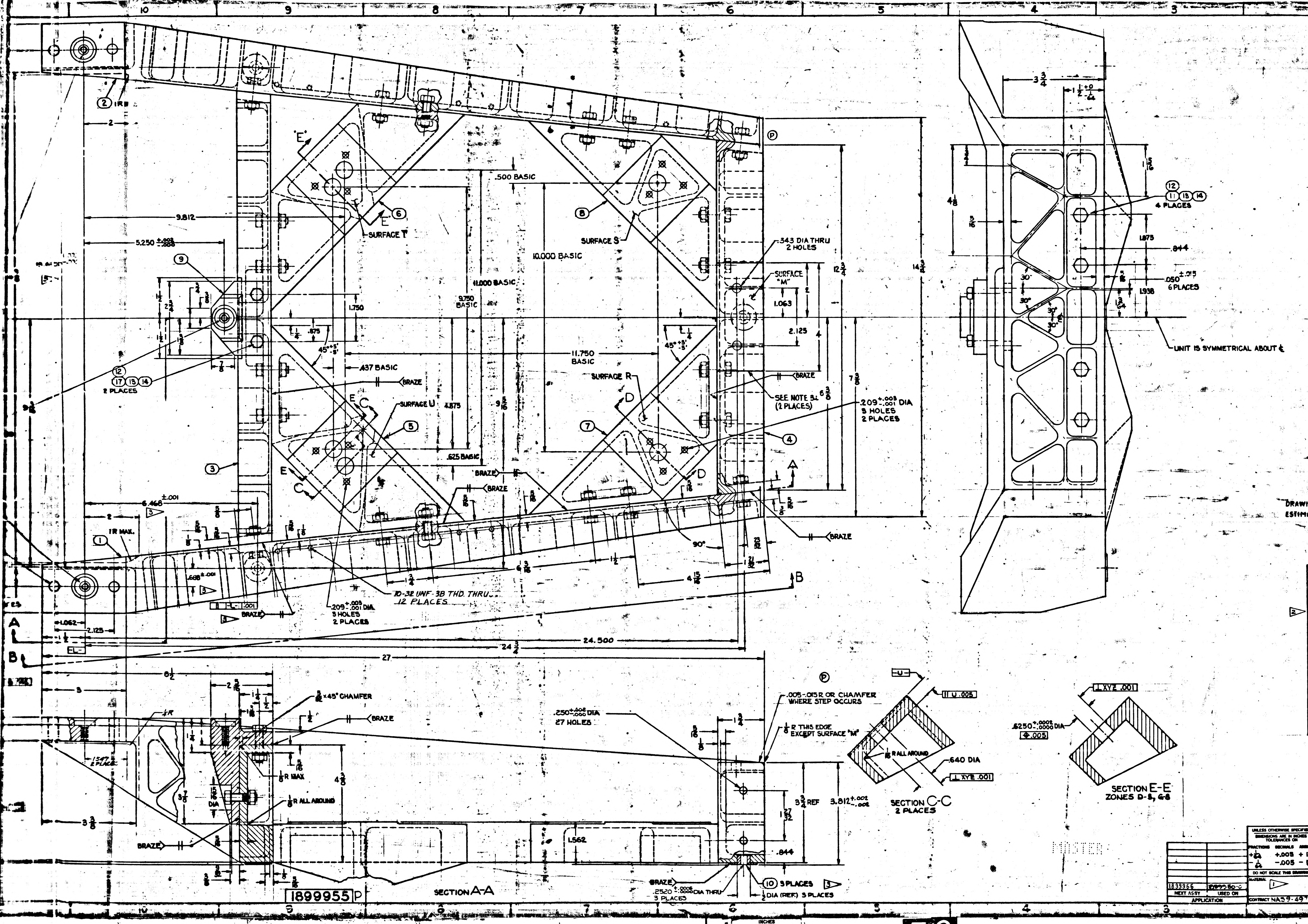
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY.-
NAVIGATION BASE
(INSEP)

CODE IDENT NO.
SIZE J3
1899955
SCALE 1:1
SHEET

1899955 P

E-4


SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE "M"
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
9.812
5.250 +.002 -.000
6.468 ±.001
.688 ±.001
24.500
24 3/4
27
.343 DIA THRU 2 HOLES
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU 12 PLACES
SEE NOTE 3 (2 PLACES)
BRAZE
1R MAX.
45° +5' -5'
90°
UNIT IS SYMMETRICAL ABOUT ℄
4 PLACES
.050 ±.015 6 PLACES
1.875
.844
1.938
30°
DRAWING INCOMPLETE
ESTIMATED 12 TAPPED HOLES TO BE
SECTION A-A
SECTION C-C 2 PLACES
SECTION E-E ZONES D-8, G-8
5/32 x 45° CHAMFER
.005-.015 R OR CHAMFER WHERE STEP OCCURS
1/64 R THIS EDGE EXCEPT SURFACE "M"
.250 +.002 -.000 DIA 27 HOLES
.6250 +.0002 -.0000 DIA
.640 DIA
1/16 R ALL AROUND
1/8 R MAX
1/8 R ALL AROUND
3.812 +.002 -.002
3 3/4 REF
.2520 +.0005 -.0000 DIA THRU 3 PLACES
1/2 DIA (REF) 3 PLACES
10 3 PLACES
1.562
1899955 P
MASTER
INCHES
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	
G		UPGRADED A CLASS A SE
H		NOT USED
J		REVISED W WITH TDRR
K		REVISED IN WITH TDRR
L		REVISED IN WITH TDRR
M		REVISED PE TDRR NO. 3
N		REVISED PER TDRR NO. 03
D		REVISED PER TDRR NO. 04

ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	
17	2	MS 3 308-009	SC
16			
15			
14	27	MS 3 690-430	NU
13	27	MS 3 338-082	WA
12	27	AN-9 0C416	WA
11	25	MS-3 308-008	SC
10	3	-010	PA
9	1	-009	OP
8	1	-008	IM
7	1	-007	
6	1	-006	
5	1	-005	
4	1	-004	BR
3	1	-003	BR
2	1	-002	AR
1	1	18999 55 -001	AR

LIST OF PA

1899966	1899950-0
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

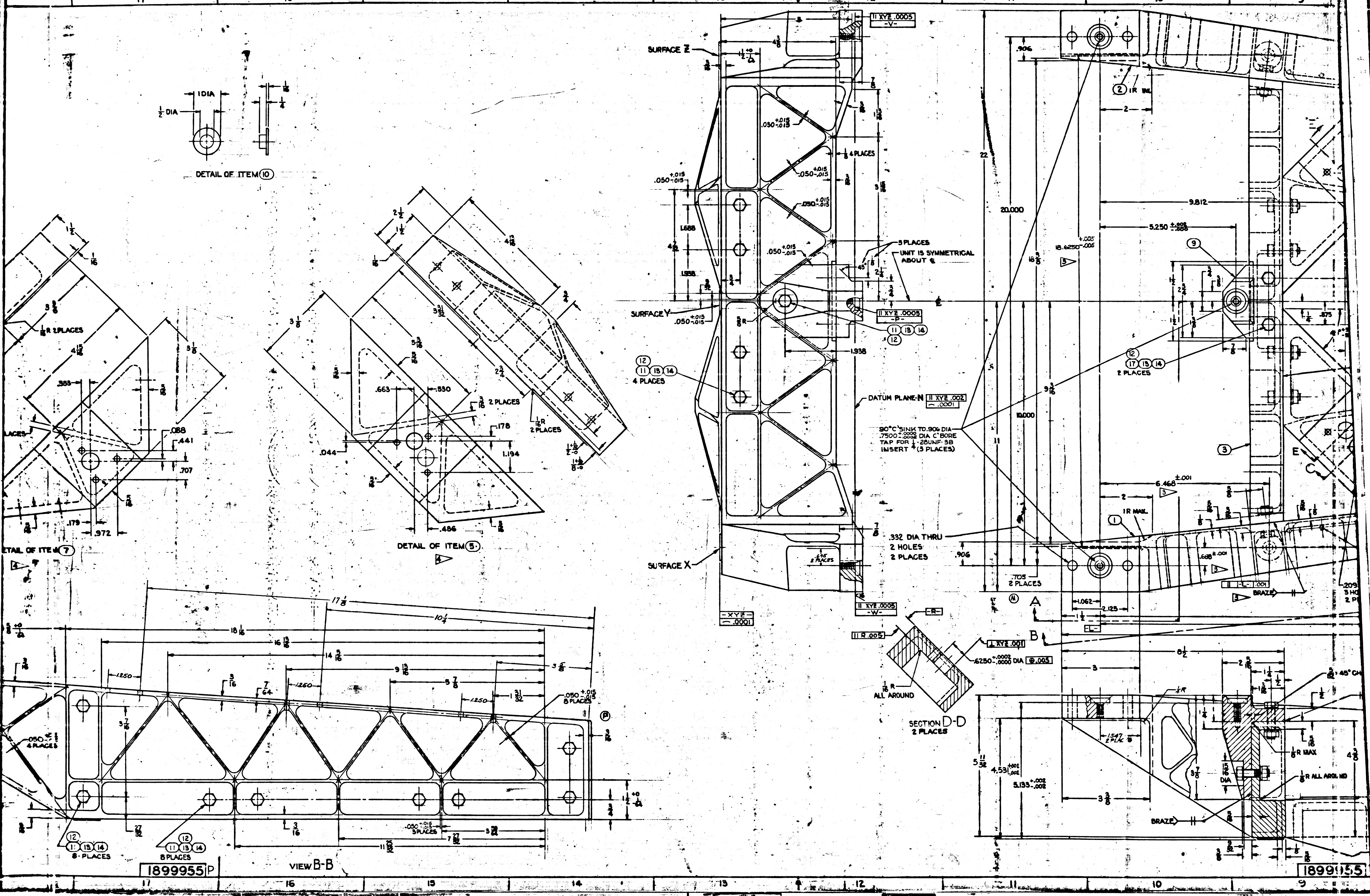
FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP-PN

DRAWN	COOPER	2 NOV 62
CHECKED		4 DEC 62
APPROVAL	J.A.	5 DEC 62
APPROVAL		6 DEC 62
NASA APPROVAL		12-2-62
MIT APPROVAL		12/2/62

STR
NAV
CODE
SCALE

DETAIL OF ITEM (10)
1 DIA
1/2 DIA
1/16
1/4
DETAIL OF ITEM (5)
DETAIL OF ITEM (7)
.663
.530
3/16 2 PLACES
1/16 R 2 PLACES
.178
1.194
.044
.486
.353
.088
.441
.707
.179
.972
1/16 R 2 PLACES
SURFACE Z
SURFACE Y
SURFACE X
.050 +.015 -.015
1/8 4 PLACES
3 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
11 XYZ .0005 -V-
11 XYZ .0005 -P-
11 XYZ .0005 -W-
-XYZ- ⌒ .0001
1.688
1.938
(12) (11) (13) (14) 4 PLACES
DATUM PLANE-N 11 XYZ .002 ⌒ .0001
90° C'SINK TO .906 DIA .7500 +.0002 -.0000 DIA C'BORE TAP FOR 1/4-28UNF-3B INSERT (3 PLACES)
.332 DIA THRU 2 HOLES 2 PLACES
.906
.705 2 PLACES
20.000
10.000
18.6250 +.005 -.005
22
9.812
5.250 +.002 -.000
6.468 ±.001
1.688 ±.001
(9)
(12) (17) (13) (14) 2 PLACES
(2) 1R INL
(3)
(1) 1R MAX.
BRAZE
1.062
2.125
A
B
-L-
11 R .005
-R-
⊥ XYZ .001
.6250 +.0002 -.0000 DIA ⊕ .005
1/16 R ALL AROUND
SECTION D-D 2 PLACES
1/8 R MAX
1/8 R ALL AROUND
15/16 DIA
4.531 +.001 -.002
5.133 +.002 -.002
1.547 2 PLACES
5/32 × 45° CH
.209 3 HO 2 P
VIEW B-B
17 1/8
10 1/4
18 1/16
16 13/16
14 5/16
9 13/16
5 7/8
1.250
1.260
.050 +.015 -.015 8 PLACES
.050 +.015 -.015 4 PLACES
.050 +.015 -.015 3 PLACES
(12) (11) (13) (14) 8 PLACES
(12) (11) (13) (14) 8 PLACES
11 25/32
7 27/32
1899955 P
17 16 15 14 13 12 11 10 9

1. INTERPRET DRAWING IN ACCORDANCE WITH ~~MIL-D-70327~~

1 2. MATERIAL:

   a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531

   b. REFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A.

   C. BRAZE MATERIAL - SILVER-LITHIUM PER ND 1002021.

3. REQUIREMENTS:

   a. UNLESS OTHERWISE SPECIFIED:

      1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED 63
      3. ALL FILLETS $\frac{1}{4}$ R
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1°F

   C. BRAZE PER ND1002020.

2 d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 IN. LBS.

e. PLANE CONTAINING SURFACES R, S, T & U MUST BE PARALLEL WITH PLANE -XYZ- WITHIN .005.

f. SURFACES RST & U TO BE 32 AA

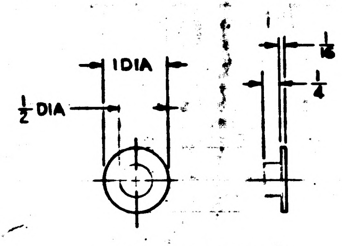
g. PRIOR TO ANY MACHINING & AFTER BRAZING, STABILIZE PER ND 1002022.

h. DATUM PLANE -N- IS DEFINED BY THE HIGH POINTS OF SURFACES P V W.

i. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW $3\frac{3}{4}$ REF DIMENSION.

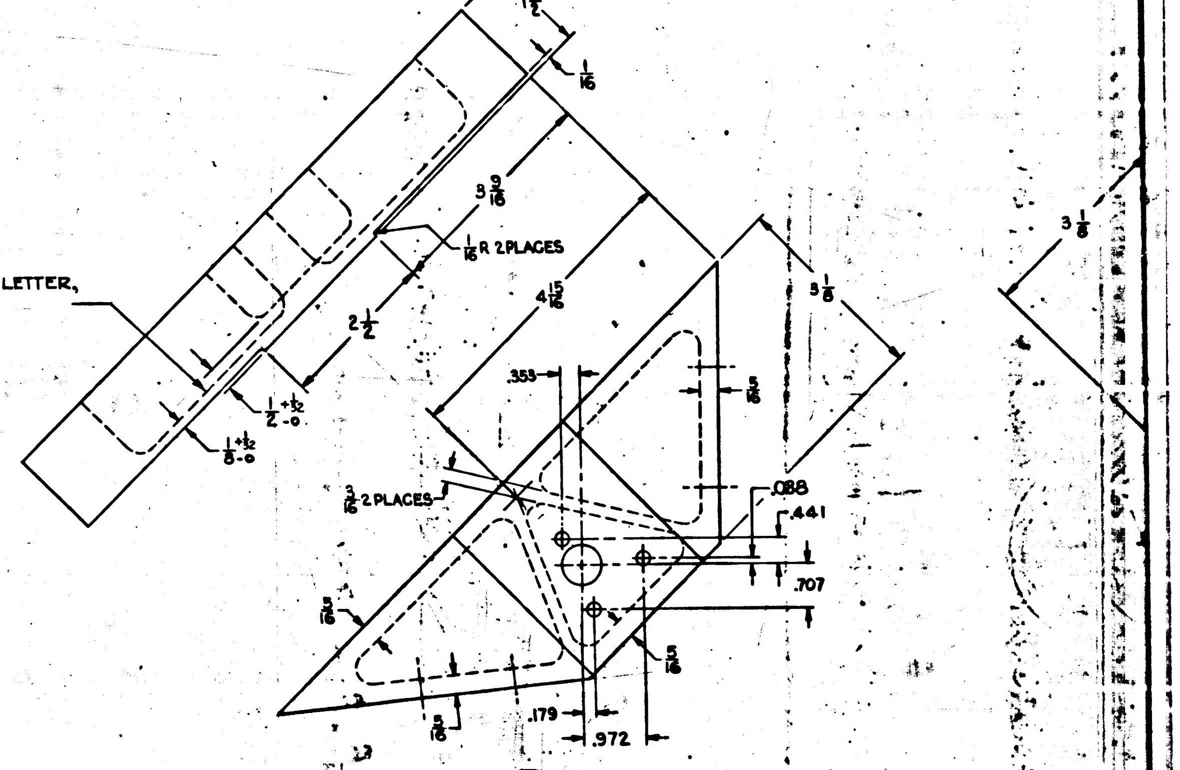
3 j. THESE TOLERANCE & PARALLELISM NOTES APPLY ONLY TO .2520 DIA. HOLE AND THE TOLERANCE FOR LOCATING ITEM 10 IS ± .015.

4 k. THESE FRACTIONAL DIMENSIONS ARE TO BE INSPECTED PRIOR TO BRAZING.


1 DIA
1/2 DIA
1/16
1/4

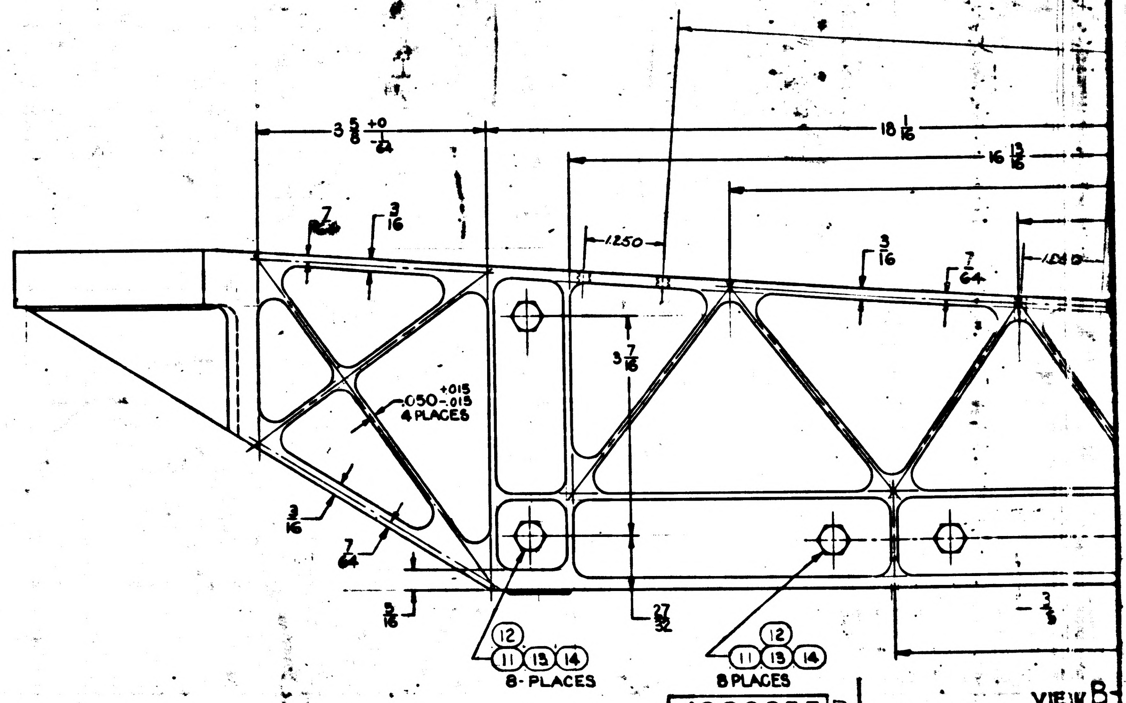
DETAIL OF ITEM 10

IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND 1002023.


1 1/2
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
2 1/2
1/2 +1/32 -0
1/8 +1/32 -0
5 1/8
3 1/8
.353
5/16
3/16 2 PLACES
.088
.441
.707
5/16
5/16
5/16
.179
.972

DETAIL OF ITEM 7

4

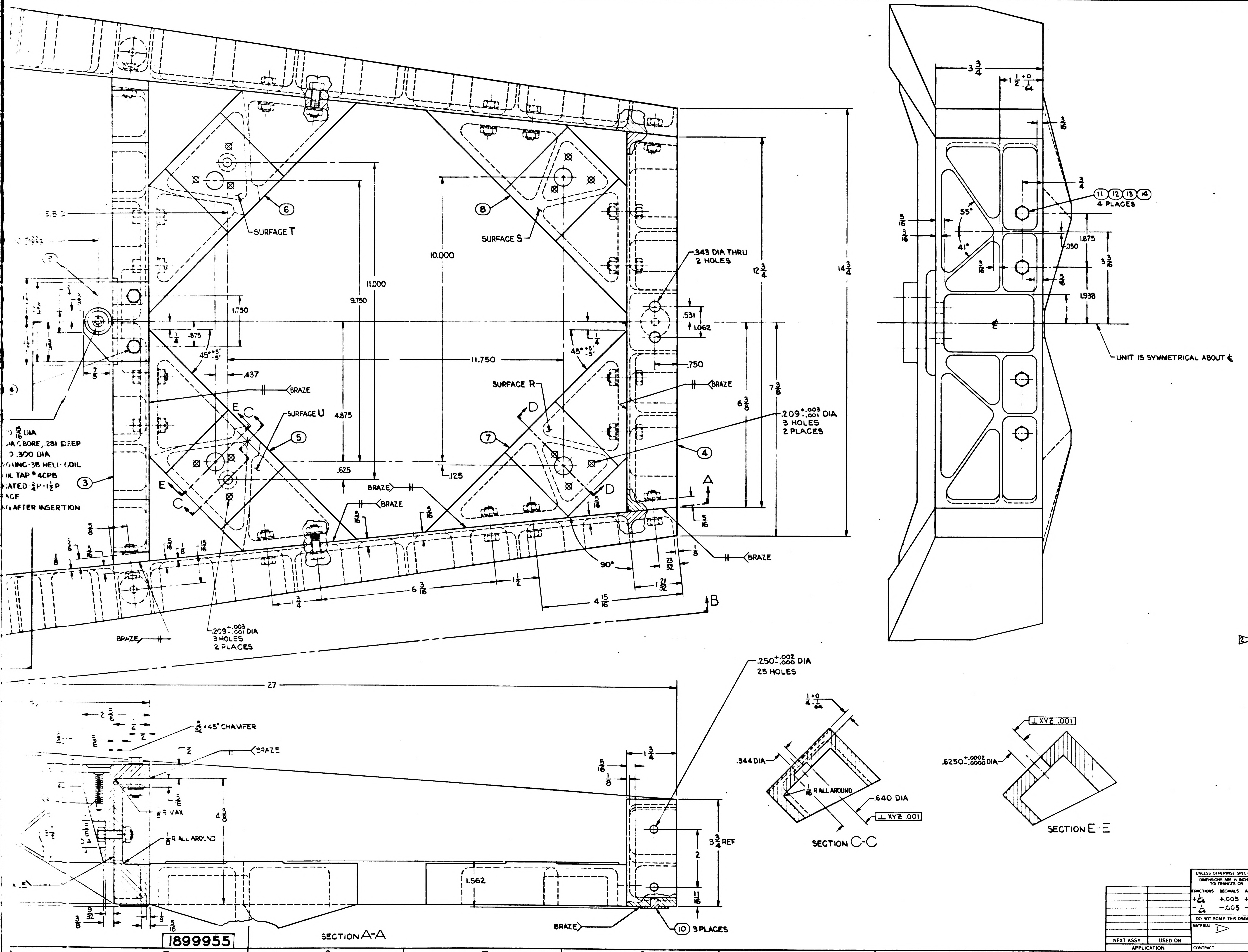

3 5/8 +0 -1/64
18 1/16
16 13/16
7/64
3/16
.1250
3/16
7/64
3 7/16
.050 +.015 -.015 4 PLACES
3/16
7/64
3/16
27/32
3/8
12
11 13 14
8-PLACES
12
11 13 14
8 PLACES

VIEW B

1899955

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD

REVISIONS



SURFACE T
SURFACE S
SURFACE R
SURFACE U
.343 DIA THRU 2 HOLES
.209 +.003 -.001 DIA 3 HOLES 2 PLACES
.250 +.002 -.000 DIA 25 HOLES
BRAZE
11.000
10.000
9.750
11.750
4.875
1.750
.875
.437
.625
.125
.531
1.062
.750
12 3/4
14 3/4
7 3/8
6 3/8
6 3/16
4 15/16
1 3/4
1 1/2
1 21/32
23/32
45° +5' -5'
90°
13/16 DIA
C'BORE .281 DEEP
.300 DIA
UNC-3B HELI-COIL
COIL TAP #4CPB
ATED 3/4P-1 1/2 P
AGE
G AFTER INSERTION
3 3/4
1 1/2 +0 -1/64
55°
41°
.050
1.875
1.938
3 3/8
11 12 13 14 4 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
27
3/32 x 45° CHAMFER
1/8 R MAX
1/8 R ALL AROUND
4 3/8
3 3/4 REF
1.562
10 3 PLACES
SECTION A-A
.344 DIA
1/16 R ALL AROUND
.640 DIA
⊥ XYZ .001
4 +0 -1/64
SECTION C-C
.6250 +.0002 -.0000 DIA
SECTION E-E

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00 167 DATE 12 DEC '62

16	2	MS 21209-C4-15	HELI-COIL - SELF LOCKING 1/4-20 UNC
15	1	MS 21209-C4-20	HELI-COIL - SELF LOCKING 1/4-20 UNC
14	25	MS 35690-430	NUT - PLAIN HEX
13	25	MS 35338-082	WASHER - SPLIT LOCK
12	25	MS 15795-311	WASHER - PLAIN
11	25	MS-35308-008	SCREW - HEX HD
10	3	-10	PAD - REFERENCE
9	1	-9	OPTICS SUPPORT - REAR
8	1	-8	IMU SUPPORT - R.H. REAR
7	1	-7	-L.H. REAR
6	1	-6	-R.H. FRONT
5	1	-5	-L.H. FRONT
4	1	-4	BRIDGE - BACK
3	1	-3	BRIDGE - FRONT
2	1	-2	ARM - R.H.
1	1	1899955 -1	ARM - L.H.
ITEM NO.	NO. REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

1899955

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN COOPER DATE 27 NOV 62
CHECKED 4 DEC 62
APPROVAL 4 DEC 62
APPROVAL
NASA APPROVAL
MIT APPROVAL

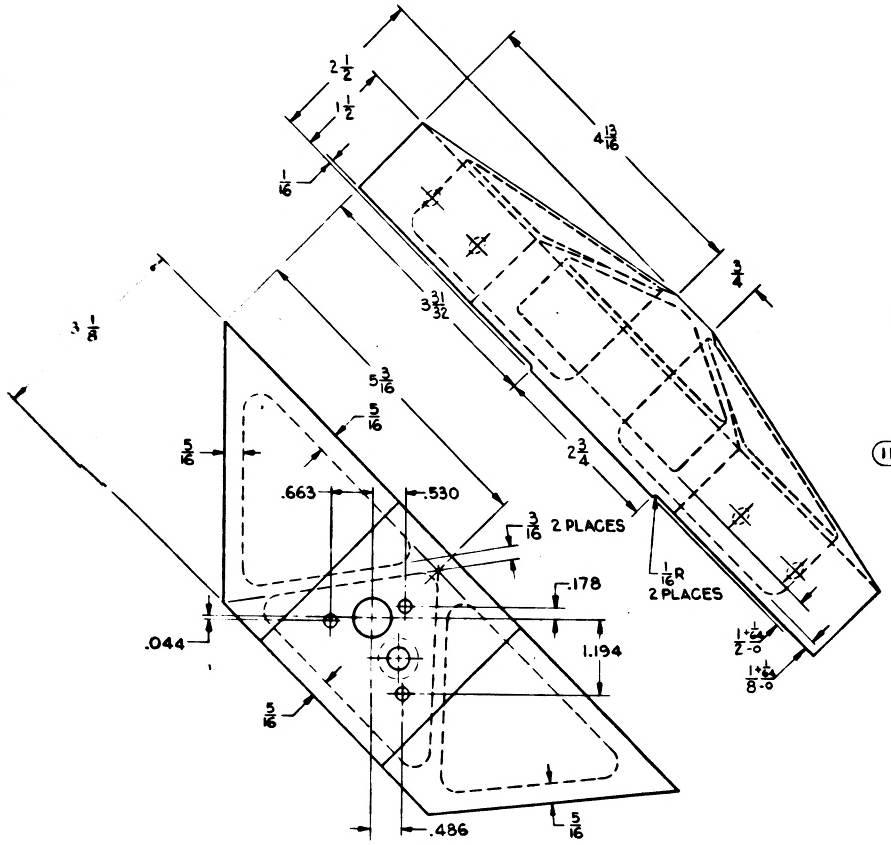
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY. -
NAVIGATION BASE
(INSEP)

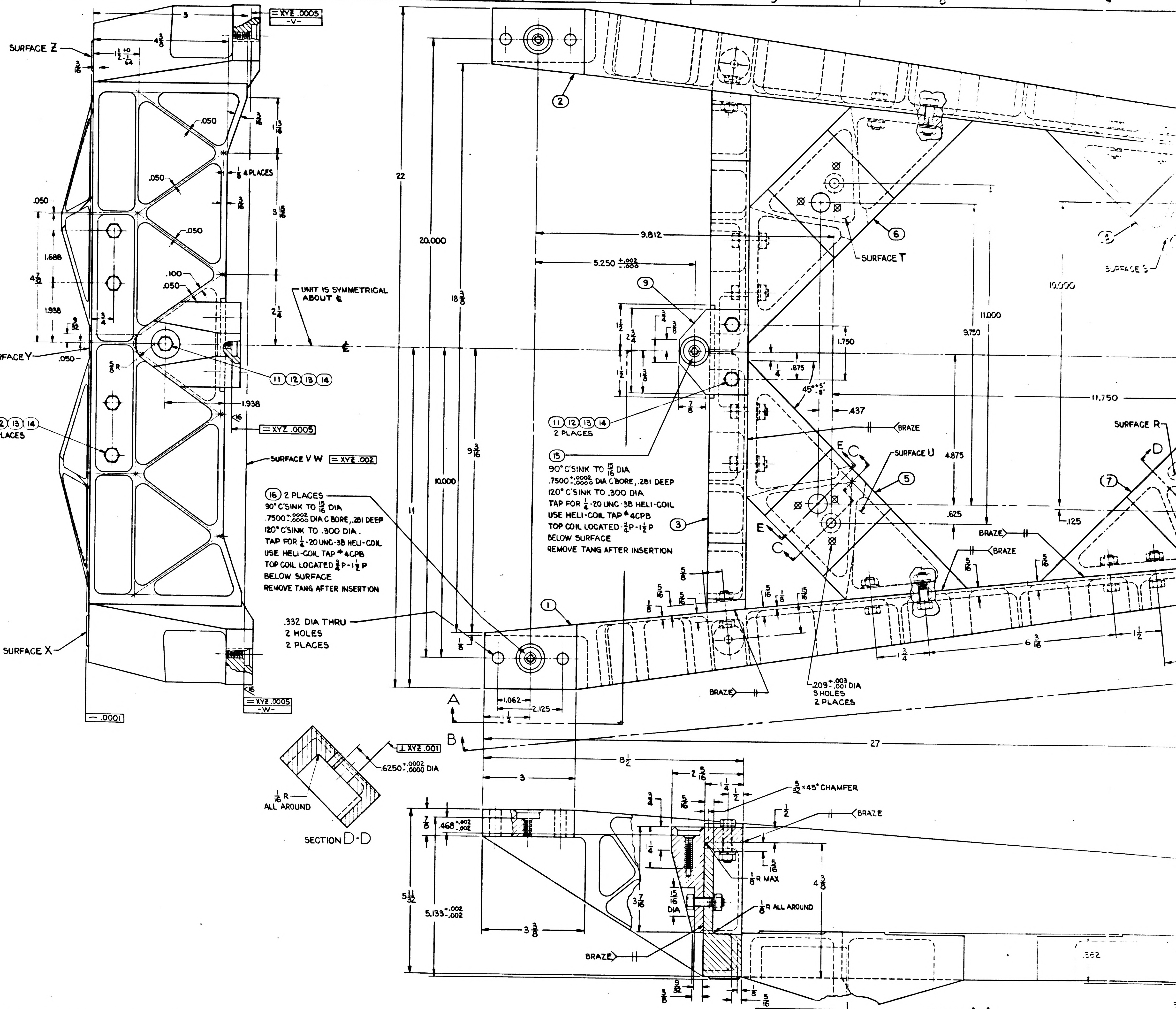
CODE IDENT NO
SIZE J3
1899955
SCALE 1:1
SHEET

1899955

31/93


2 1/2
1 1/2
4 13/16
1/16
3/4
3 31/32
3 1/8
5 3/16
5/16
2 3/4
5/16
.663
.530
3/16 2 PLACES
1/16 R
2 PLACES
.178
1.194
.044
5/16
1/2 +1/64 -0
1 +1/64 -0
.486
5/16

DETAIL OF ITEM 5

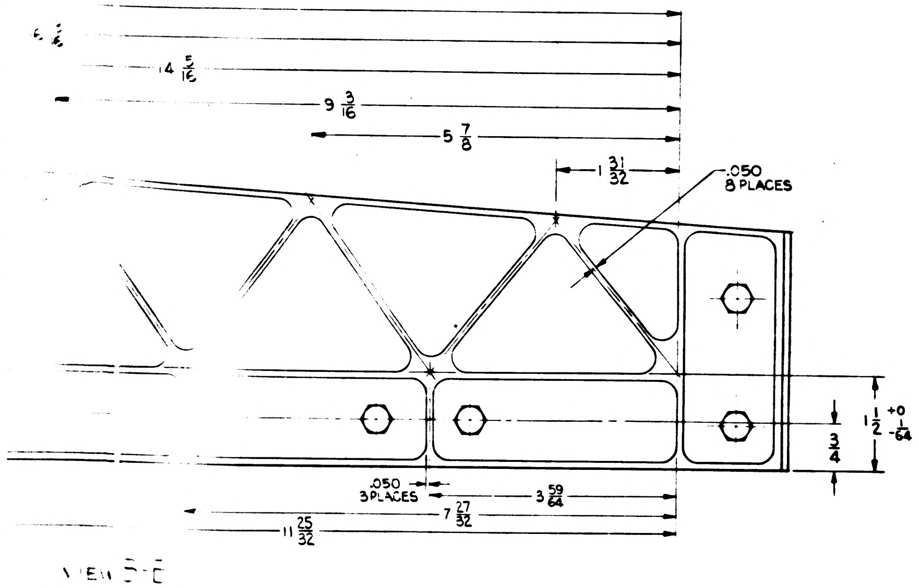

5
= XYZ .0005
-V-
SURFACE Z
4 3/8
1 1/2 +0 -1/64
3/16
.050
3/16
1 13/16
.050
1/8 4 PLACES
.050
3/16
3 15/16
.050
1.688
4 7/32
.100
.050
UNIT IS SYMMETRICAL ABOUT ℄
1.938
9/32
3/4
2 1/4
SURFACE Y
.050
℄
5/8 R
11 12 13 14
1.938
1/16
= XYZ .0005
11 12 13 14
4 PLACES
SURFACE V W
= XYZ .002
SURFACE X
1/16
= XYZ .0005
-W-
⌒ .0001
22
20.000
18 3/8
9 3/16
10.000
11
1/8
2
9.812
5.250 +.002 -.000
9
1 1/2
2 3/4
3/4
1 3/8
1 1/2
1 3/8
1/4
7/8
1.750
.875
1/4
45° +5' -5'
.437
11 12 13 14
2 PLACES
BRAZE
6
SURFACE T
SURFACE S
10.000
11.000
3.750
11.750
SURFACE R
D
E
C
SURFACE U
4.875
5
7
E
C
.625
.125
BRAZE
BRAZE
5/16
5/16
3
5/8
5/16
5/16
1/8
5/16
1/8
5/16
1
6 3/16
1 1/2
1 3/4
.332 DIA THRU
2 HOLES
2 PLACES
BRAZE
.209 +.003 -.001 DIA
3 HOLES
2 PLACES
1.062
2.125
1 1/2
A
B
27
8 1/2
⊥ XYZ .001
.6250 +.0002 -.0000 DIA
1/16 R
ALL AROUND
3
2 5/16
1 1/4
1/2
5/32 x 45° CHAMFER
1/2
BRAZE
3/4
5/16
7/8
.468 +.002 -.002
1/4
5/16
1/8 R MAX
4 3/8
5 11/32
5.133 +.002 -.002
3 7/16
15/16 DIA
1/8 R ALL AROUND
3 3/8
BRAZE
.562
9/32
3/8
1/8
5/16

(16) 2 PLACES
90° C'SINK TO 15/16 DIA
.7500 +.0002 -.0000 DIA C'BORE, .281 DEEP
120° C'SINK TO .300 DIA.
TAP FOR 1/4-20 UNC-3B HELI-COIL
USE HELI-COIL TAP # 4CPB
TOP COIL LOCATED 3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION

(15)
90° C'SINK TO 15/16 DIA
.7500 +.0002 -.0000 DIA C'BORE, .281 DEEP
120° C'SINK TO .300 DIA
TAP FOR 1/4-20 UNC-3B HELI-COIL
USE HELI-COIL TAP # 4CPB
TOP COIL LOCATED-3/4P-1 1/2P
BELOW SURFACE
REMOVE TANG AFTER INSERTION

SECTION D-D

SECTION A-A


6 3/4
14 5/16
9 3/16
5 7/8
1 31/32
.050
8 PLACES
1 1/2 +0 -1/64
3/4
.050
3 PLACES
3 59/64
7 27/32
11 25/32

VIEW B-B

1899955

2/93

1. INTEPPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

▷ 2. MATERIAL:
   a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21531
   b. BRAZE MATERIAL - NAVIGATION BASE, SILVER-LITHIUM PER
   c. PEFERENCE PADS - STAINLESS STEEL PER QQ-S-766, CLASS 302, ½ HARD.
   d. BRAZE MATERIAL - REFERENCE PAD, PER MIL-

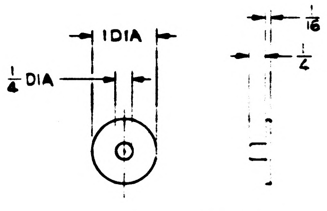
3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS AND BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED $\sqrt[63]{}$AA.
      3. ALL FILLETS ½ R
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° F.

   b. CLEARANCE BETWEEN MATING SURFACES TO BE BRAZED SHALL NOT EXCEED PRIOR TO BRAZING.

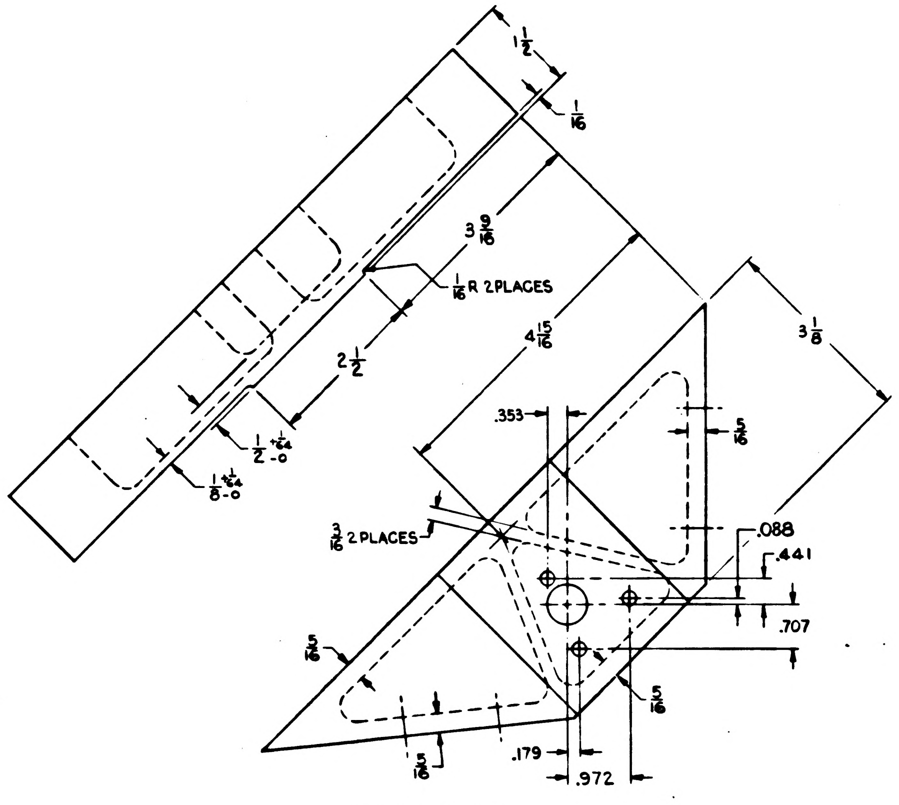
   c. FURNACE BRAZE AND STRESS RELIEVE PER MIL-

▷ d. REPLACE ALL BOLTS AND ASSOCIATED HARDWARE AFTER BRAZING AND ADD LOCK WASHERS. TORQUE BOLTS TO 62 ± 3 LBS.
   e. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   f. SURFACES RST&U TO BE $\sqrt[32]{}$AA

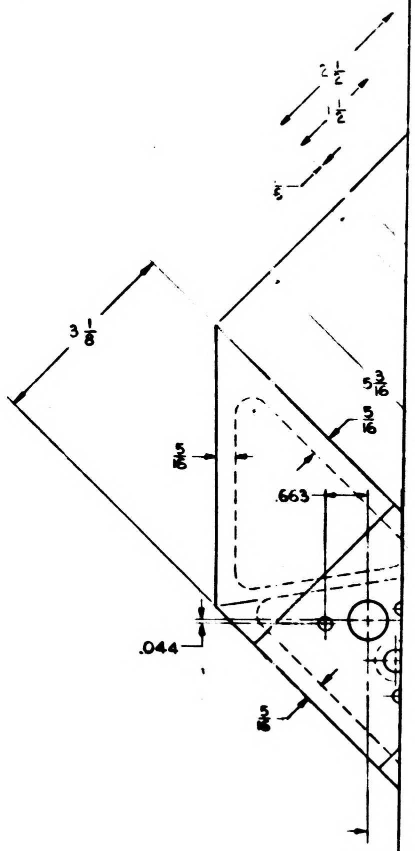
   g. PRIOR TO ANY MACHINING AFTER BRAZING;
      STABILIZE: CYCLE THROUGH -100°F TO +300°F TEMPERATURE RANGE 5 TIMES WITH CHANGE RATE NOT EXCEEDING 100°F/HOUR. PER MIL-
   h. CHEMICAL ETCH PER MIL-


1 DIA
¼ DIA
1/16
½

DETAIL OF ITEM 10

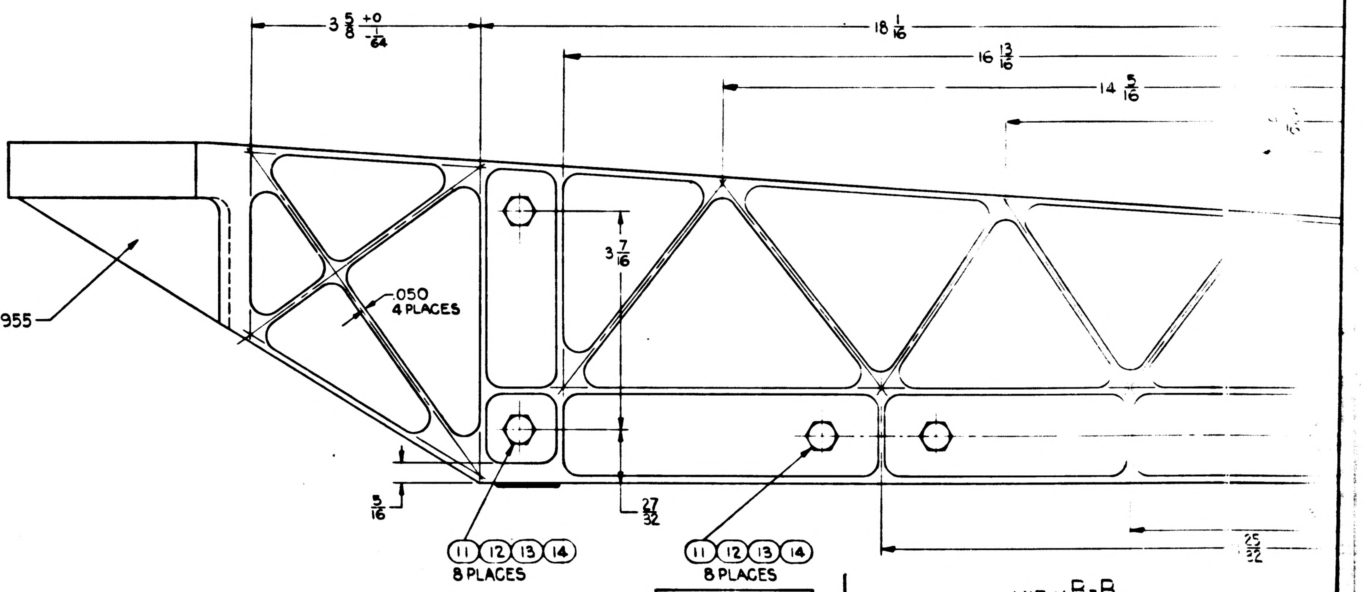

1½
1/16
3 9/16
1/16 R 2 PLACES
4 15/16
2½
3⅛
½ +1/64 -0
⅛ +1/64 -0
.353
5/16
3/16 2 PLACES
.088
.441
.707
5/16
5/16
5/16
.179
.972

DETAIL OF ITEM 7


2½
½
3⅛
5 3/16
5/16
5/16
.663
.044
5/16

DETAIL

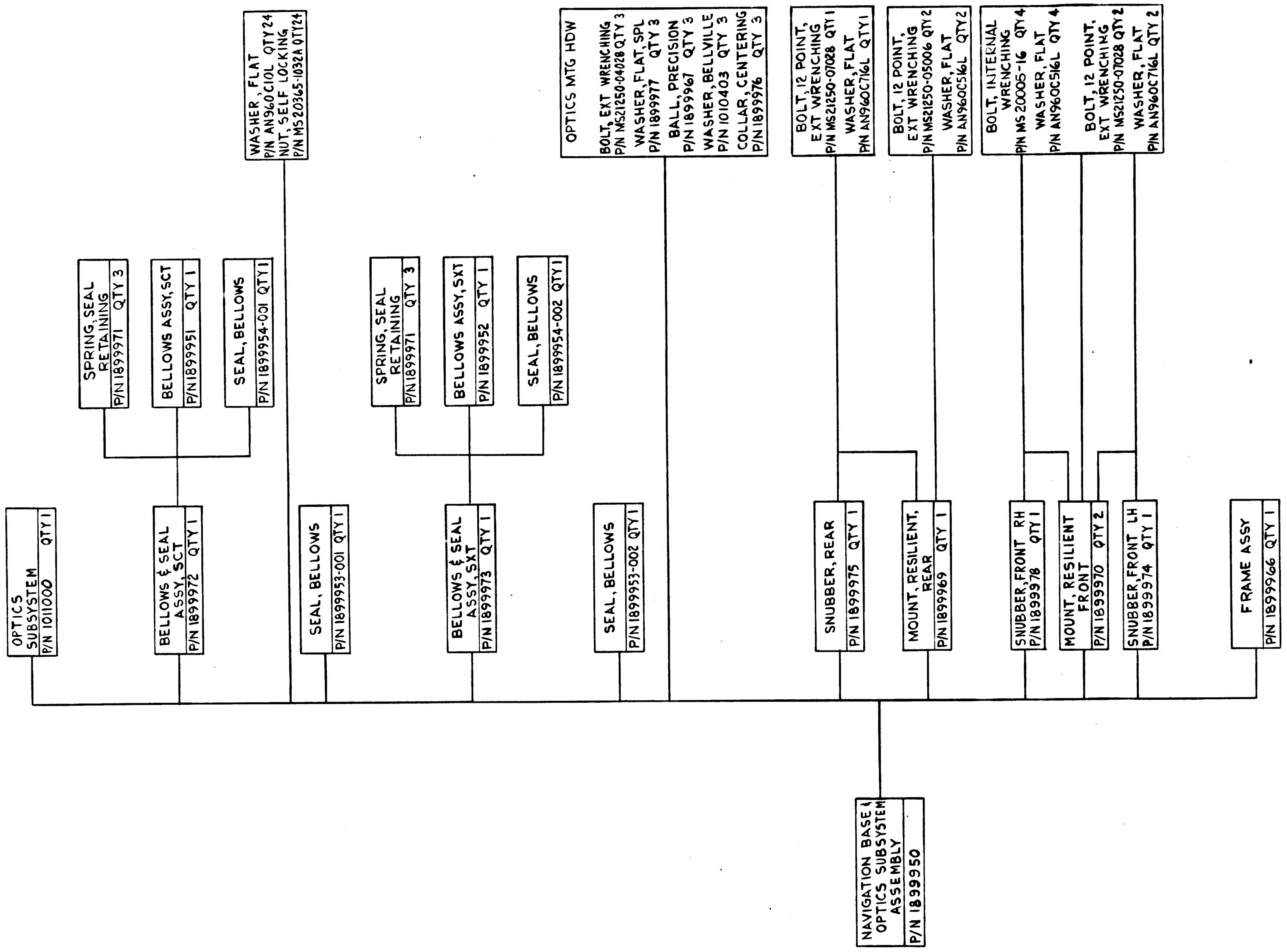
STENCIL PIECEMARK 1899955
PER MIL-STD-130


3 5/8 +0 -1/64
18 1/16
16 13/16
14 5/16
3 7/16
.050 4 PLACES
5/16
27/32
25/32
11 12 13 14 8 PLACES
11 12 13 14 8 PLACES

VIEW B-B

1899955

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A1		(A1) COMPLETELY REVISED & REDRAWN	DO 51332	22 FEB 63	EWA
B1		(B1) ADDED OPTICS SUBSYSTEM P/N 1011000, NUTS P/N MS20365-1032A, WASHER P/N AN960 C10L SNUBBER FRONT RH P/N 1899978	DO 51454	15 APR 63	FK



WASHER, FLAT P/N AN960C10L QTY 24
NUT, SELF LOCKING P/N MS20365-1032A QTY 24
OPTICS MTG HDW
BOLT, EXT WRENCHING P/N MS21250-04028 QTY 3
WASHER, FLAT, SPL P/N 1899977 QTY 3
BALL, PRECISION P/N 1899967 QTY 3
WASHER, BELLVILLE P/N 1010403 QTY 3
COLLAR, CENTERING P/N 1899976 QTY 3
BOLT, 12 POINT, EXT WRENCHING P/N MS21250-07028 QTY 1
WASHER, FLAT P/N AN960C716L QTY 1
BOLT, 12 POINT, EXT WRENCHING P/N MS21250-05006 QTY 2
WASHER, FLAT P/N AN960C516L QTY 2
BOLT, INTERNAL WRENCHING P/N MS 20005-16 QTY 4
WASHER, FLAT P/N AN960C516L QTY 4
BOLT, 12 POINT, EXT WRENCHING P/N MS21250-07028 QTY 2
WASHER, FLAT P/N AN960C716L QTY 2
SPRING, SEAL RETAINING P/N 1899971 QTY 3
BELLOWS ASSY, SCT P/N 1899951 QTY 1
SEAL, BELLOWS P/N 1899954-001 QTY 1
SPRING, SEAL RETAINING P/N 1899971 QTY 3
BELLOWS ASSY, SXT P/N 1899952 QTY 1
SEAL, BELLOWS P/N 1899954-002 QTY 1
OPTICS SUBSYSTEM P/N 1011000 QTY 1
BELLOWS & SEAL ASSY, SCT P/N 1899972 QTY 1
SEAL, BELLOWS P/N 1899953-001 QTY 1
BELLOWS & SEAL ASSY, SXT P/N 1899973 QTY 1
SEAL, BELLOWS P/N 1899953-002 QTY 1
SNUBBER, REAR P/N 1899975 QTY 1
MOUNT, RESILIENT, REAR P/N 1899969 QTY 1
SNUBBER, FRONT RH P/N 1899978 QTY 1
MOUNT, RESILIENT FRONT P/N 1899970 QTY 2
SNUBBER, FRONT LH P/N 1899974 QTY 1
FRAME ASSY P/N 1899966 QTY 1
NAVIGATION BASE & OPTICS SUBSYSTEM ASSEMBLY P/N 1899950

FOR INFORMATION ONLY

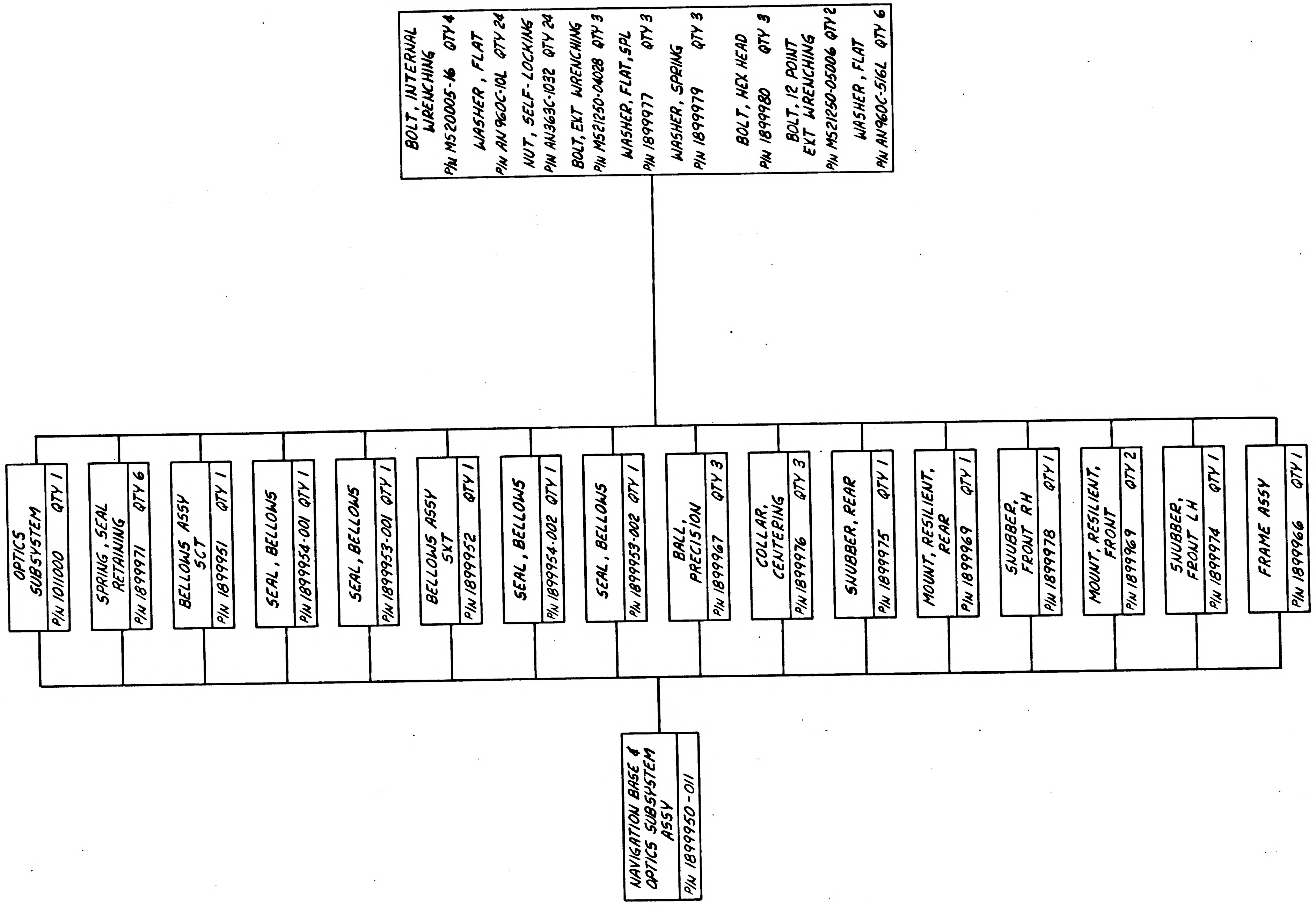
CLASS B RELEASE TDR No. ______ DATE ______

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON TEXAS	
APPLICATION		DO NOT SCALE THIS DRAWING	ACSP PN	NAVIGATION BASE & OPTICS SUBSYSTEM ASSY FAMILY TREE DRAWING	
		MATERIAL —	DRAWN FRIEDE DATE 28 NOV 62 CHECKED [illegible]SKI 5 MAR 63 APPROVAL J HANN 5 MAR 63 APPROVAL [illegible] 5 MAR 63	CODE IDENT NO	SIZE E 1899956
		CONTRACT NAS 9-497	NASA APPROVAL MIT APPROVAL	SCALE —	SHEET —

1899956

D 1899956 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS "A" RELEASE TDRR No. 079	—	27 APR 63	WF


BOLT, INTERNAL WRENCHING
P/N MS20005-16 QTY 4
WASHER, FLAT
P/N AN960C-10L QTY 24
NUT, SELF-LOCKING
P/N AN363C-1032 QTY 24
BOLT, EXT WRENCHING
P/N MS21250-04028 QTY 3
WASHER, FLAT, SPL
P/N 1899977 QTY 3
WASHER, SPRING
P/N 1899979 QTY 3
BOLT, HEX HEAD
P/N 1899980 QTY 3
BOLT, 12 POINT EXT WRENCHING
P/N MS21250-05006 QTY 2
WASHER, FLAT
P/N AN960C-516L QTY 6
OPTICS SUBSYSTEM
P/N 1011000 QTY 1
SPRING, SEAL RETAINING
P/N 1899971 QTY 6
BELLOWS ASSY SCT
P/N 1899951 QTY 1
SEAL, BELLOWS
P/N 1899954-001 QTY 1
SEAL, BELLOWS
P/N 1899953-001 QTY 1
BELLOWS ASSY SXT
P/N 1899952 QTY 1
SEAL, BELLOWS
P/N 1899954-002 QTY 1
SEAL, BELLOWS
P/N 1899953-002 QTY 1
BALL, PRECISION
P/N 1899967 QTY 3
COLLAR, CENTERING
P/N 1899976 QTY 3
SNUBBER, REAR
P/N 1899975 QTY 1
MOUNT, RESILIENT, REAR
P/N 1899969 QTY 1
SNUBBER, FRONT RH
P/N 1899978 QTY 1
MOUNT, RESILIENT, FRONT
P/N 1899969 QTY 2
SNUBBER, FRONT LH
P/N 1899974 QTY 1
FRAME ASSY
P/N 1899966 QTY 1
NAVIGATION BASE & OPTICS SUBSYSTEM ASSY
P/N 1899950-011

00917

17 APR 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 28 NOV 62
CHECKED MALIKOWSKI 5 MAR 63
APPROVAL J. HANN 5 MAR 63
APPROVAL A. J. KODEL 5 MAR 63
NASA APPROVAL W J Rhine JACK BARNARD
MIT APPROVAL D. W. KUPFER 17 APR 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

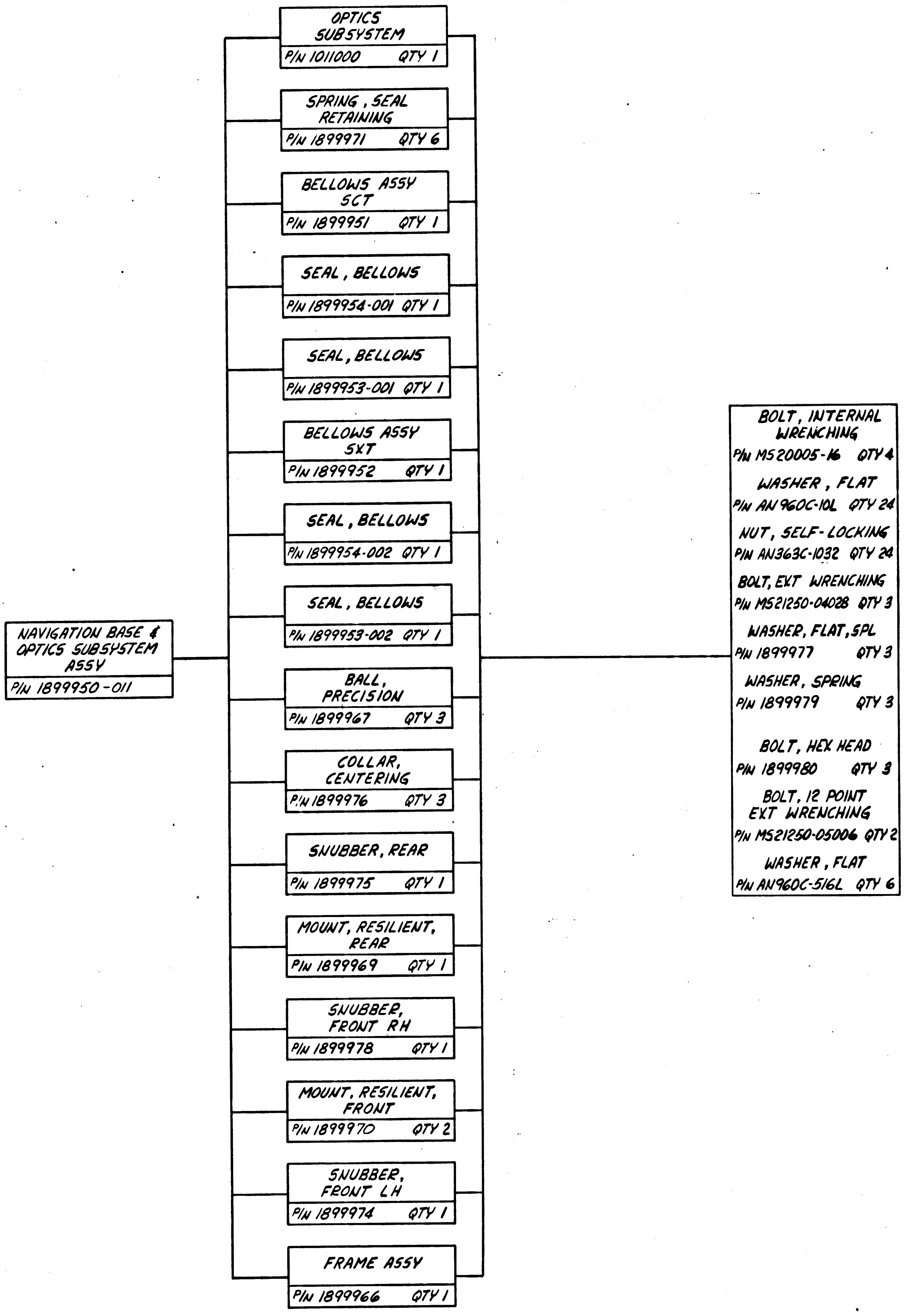
NAVIGATION BASE & OPTICS SUBSYSTEM
ASSEMBLY
FAMILY TREE DRAWING

CODE IDENT NO. SIZE D 1899956
SCALE — SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1899956

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS "A" RELEASE TDRR 00074	—	27 APR 63	WF
E		REVISED IN ACCORDANCE WITH TDRR 01595		29 JULY 63	



OPTICS SUBSYSTEM P/N 1011000 QTY 1
SPRING, SEAL RETAINING P/N 1899971 QTY 6
BELLOWS ASSY SCT P/N 1899951 QTY 1
SEAL, BELLOWS P/N 1899954-001 QTY 1
SEAL, BELLOWS P/N 1899953-001 QTY 1
BELLOWS ASSY SXT P/N 1899952 QTY 1
SEAL, BELLOWS P/N 1899954-002 QTY 1
SEAL, BELLOWS P/N 1899953-002 QTY 1
BALL, PRECISION P/N 1899967 QTY 3
COLLAR, CENTERING P/N 1899976 QTY 3
SNUBBER, REAR P/N 1899975 QTY 1
MOUNT, RESILIENT, REAR P/N 1899969 QTY 1
SNUBBER, FRONT RH P/N 1899978 QTY 1
MOUNT, RESILIENT, FRONT P/N 1899970 QTY 2
SNUBBER, FRONT LH P/N 1899974 QTY 1
FRAME ASSY P/N 1899966 QTY 1
NAVIGATION BASE & OPTICS SUBSYSTEM ASSY P/N 1899950-011
BOLT, INTERNAL WRENCHING P/N MS20005-16 QTY 4
WASHER, FLAT P/N AN960C-10L QTY 24
NUT, SELF-LOCKING P/N AN363C-1032 QTY 24
BOLT, EXT WRENCHING P/N MS21250-04028 QTY 3
WASHER, FLAT, SPL P/N 1899977 QTY 3
WASHER, SPRING P/N 1899979 QTY 3
BOLT, HEX HEAD P/N 1899980 QTY 3
BOLT, 12 POINT EXT WRENCHING P/N MS21250-05006 QTY 2
WASHER, FLAT P/N AN960C-516L QTY 6

00917
17 APR 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 28 NOV 62
CHECKED MALIKOWSKI 5 MAR 63
APPROVAL J. HAHN 5 MAR 63
APPROVAL B.J. KODEL 5 MAR 63
NASA APPROVAL JACK BARNARD
MIT APPROVAL W. KUPFER 17 APR 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

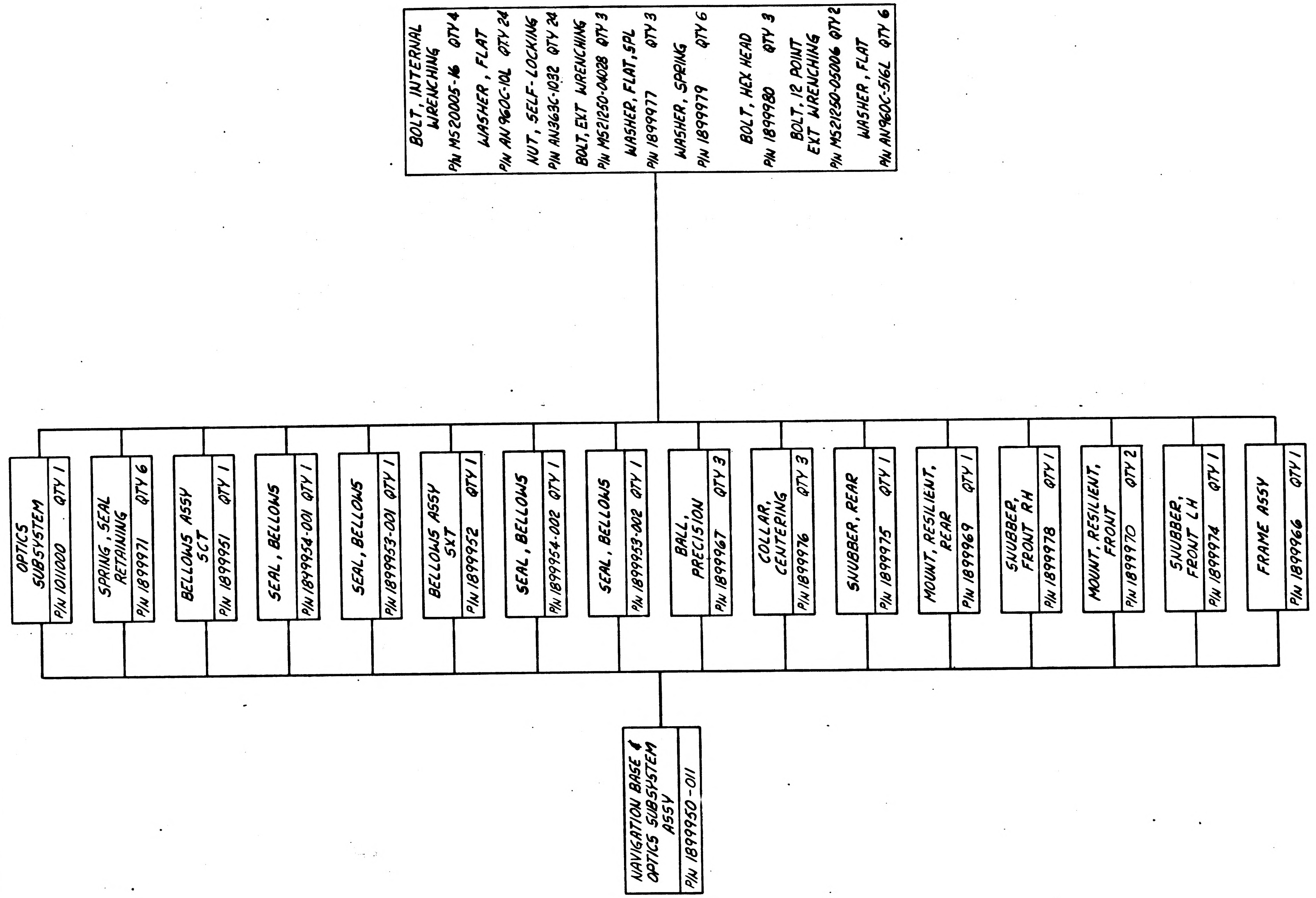
NAVIGATION BASE & OPTICS SUBSYSTEM
ASSEMBLY
FAMILY TREE DRAWING

CODE IDENT NO.
SIZE D
1899956
SCALE —
SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1899956

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS "A" RELEASE TDRR 00074	—	27 APR 63	WF WK
E		REVISED IN ACCORDANCE WITH TDRR 01595		29 JULY 63	July 31 '63 WK
F		REVISED IN ACCORDANCE WITH TDRR 02403		13 AUG '63	R.W.G WK


BOLT, INTERNAL WRENCHING P/N MS20005-16 QTY 4
WASHER, FLAT P/N AN960C-10L QTY 24
NUT, SELF-LOCKING P/N AN363C-1032 QTY 24
BOLT, EXT WRENCHING P/N MS21250-04028 QTY 3
WASHER, FLAT, SPL P/N 1899977 QTY 3
WASHER, SPRING P/N 1899979 QTY 6
BOLT, HEX HEAD P/N 1899980 QTY 3
BOLT, 12 POINT EXT WRENCHING P/N MS21250-05006 QTY 2
WASHER, FLAT P/N AN960C-516L QTY 6
OPTICS SUBSYSTEM P/N 1011000 QTY 1
SPRING, SEAL RETAINING P/N 1899971 QTY 6
BELLOWS ASSY SCT P/N 1899951 QTY 1
SEAL, BELLOWS P/N 1899954-001 QTY 1
SEAL, BELLOWS P/N 1899953-001 QTY 1
BELLOWS ASSY SXT P/N 1899952 QTY 1
SEAL, BELLOWS P/N 1899954-002 QTY 1
SEAL, BELLOWS P/N 1899953-002 QTY 1
BALL, PRECISION P/N 1899967 QTY 3
COLLAR, CENTERING P/N 1899976 QTY 3
SNUBBER, REAR P/N 1899975 QTY 1
MOUNT, RESILIENT, REAR P/N 1899969 QTY 1
SNUBBER, FRONT RH P/N 1899978 QTY 1
MOUNT, RESILIENT, FRONT P/N 1899970 QTY 2
SNUBBER, FRONT LH P/N 1899974 QTY 1
FRAME ASSY P/N 1899966 QTY 1
NAVIGATION BASE & OPTICS SUBSYSTEM ASSY P/N 1899950-011

00917

17 APR 63

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 28 NOV 62
CHECKED MALIKOWSKI 5 MAR 63
APPROVAL J. HAHN 5 MAR 63
APPROVAL A.J. KODEL 5 MAR 63
NASA APPROVAL W J [illegible] JACK BARNARD
MIT APPROVAL R [illegible] N KUPFER 17 APR 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE & OPTICS SUBSYSTEM
ASSEMBLY
FAMILY TREE DRAWING

CODE IDENT NO. | SIZE D | 1899956
SCALE — | SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A2		(A1) MATL WAS "QQ-S-763, CLASS 416 COND A." (A2) HARDNESS NOTE ADDED	DO 5:265	7 JAN 63	L.C.

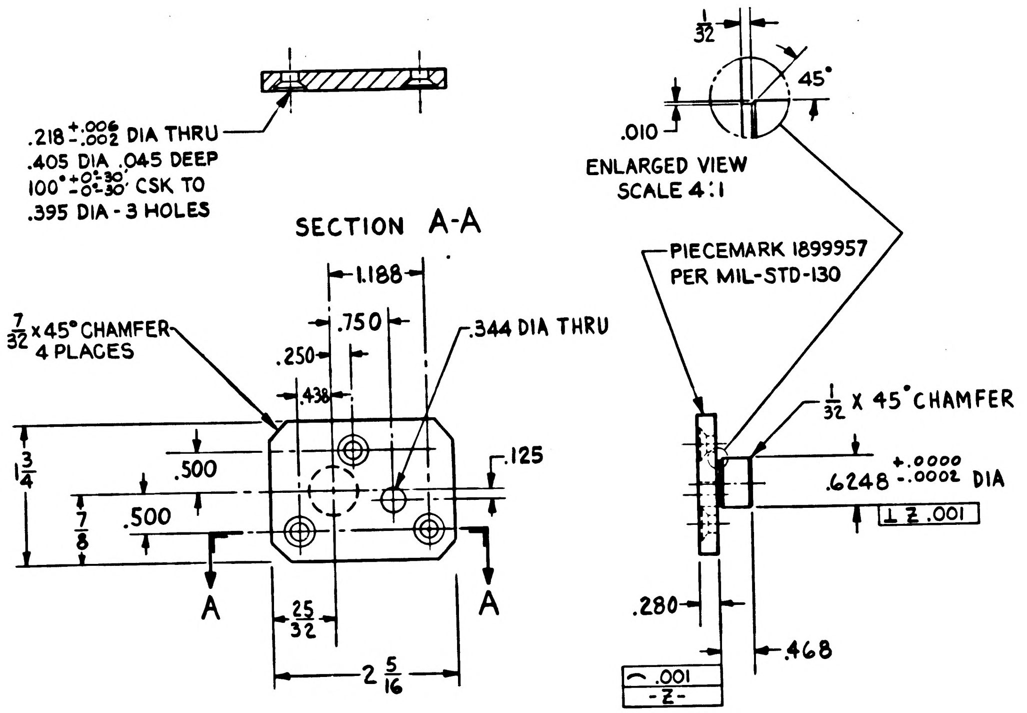
INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072
(SIG C) FINISH E-300.
UNLESS OTHERWISE SPECIFIED:

ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.

SURFACE ROUGHNESS SHALL NOT EXCEED 63 AA.

MUST BE FREE FROM BURRS.
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-900 TO Rc 40-45



.218 +.006 -.002 DIA THRU
.405 DIA .045 DEEP
100° +0°30' -0°30' CSK TO
.395 DIA - 3 HOLES
SECTION A-A
1/32
45°
.010
ENLARGED VIEW
SCALE 4:1
PIECEMARK 1899957
PER MIL-STD-130
7/32 x 45° CHAMFER
4 PLACES
1.188
.750
.250
.438
.344 DIA THRU
.125
1 3/4
.500
7/8
.500
A
A
25/32
2 5/16
1/32 x 45° CHAMFER
.6248 +.0000 -.0002 DIA
⊥ Z .001
.280
.468
⌒ .001
-Z-

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 DATE 23 Jan 1963

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING

MATERIAL ▷

14 Dec 62

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN F. KORACIN DATE 29 NOV 62
CHECKED J Saylor 14 DEC 62
APPROVAL J Hamm 14 DEC 62
APPROVAL 14 DEC 62
NASA APPROVAL 1-23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD-IMU MOUNTING
LEFT HAND FRONT

CODE IDENT NO.
SIZE D
1899957
SCALE 1:1
SHEET

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		UPGRADED FOR CLASS A RELEASE TDRR 01080		27 APR 63	A.J.F. / WJ

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

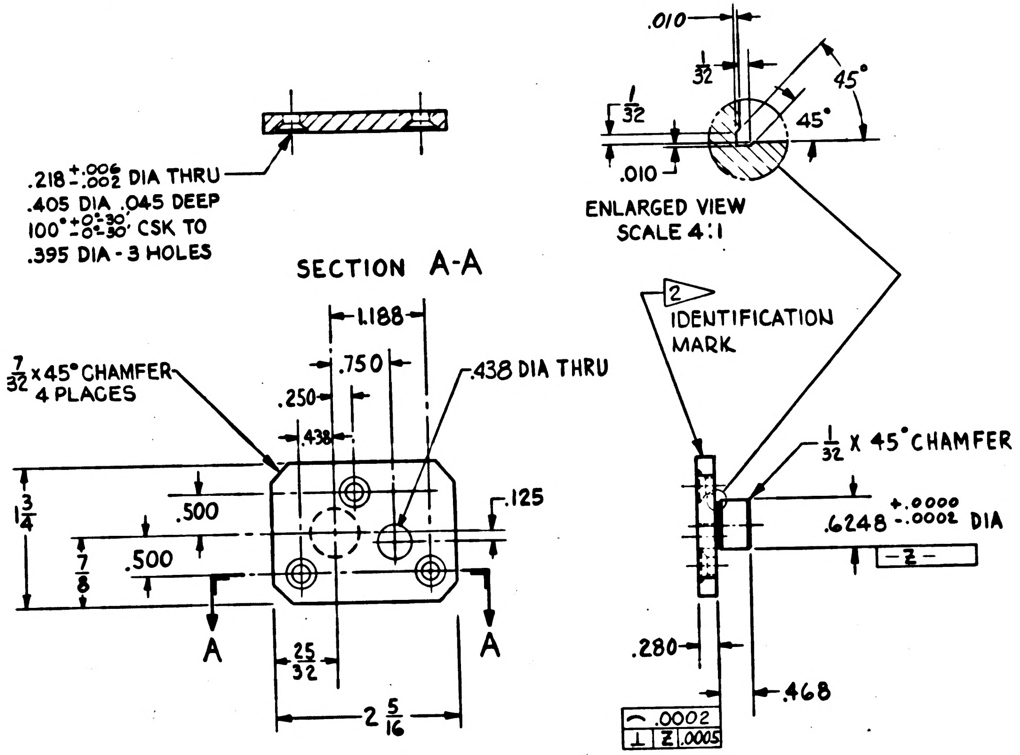
UNLESS OTHERWISE SPECIFIED:

ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.

SURFACE ROUGHNESS SHALL NOT EXCEED 63 AA.

MUST BE FREE FROM BURRS.
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-1150.

2▷ IDENTIFY USING DRAWING Nº AND REVISION LETTER PER MIL-STD-130.



.218 +.006 -.002 DIA THRU
.405 DIA .045 DEEP
100° +0°-30' -0°-30' CSK TO
.395 DIA - 3 HOLES
SECTION A-A
1.188
.750
.250
.438
.438 DIA THRU
7/32 x 45° CHAMFER 4 PLACES
1 3/4
.500
7/8
.500
.125
A
A
25/32
2 5/16
.010
1/32
1/32
.010
45°
45°
ENLARGED VIEW SCALE 4:1
2 IDENTIFICATION MARK
1/32 X 45° CHAMFER
.6248 +.0000 -.0002 DIA
-Z-
.280
.468
⌒ .0002
⊥ Z .0005

00298

23 Jan 1963

1899966	1899950-01	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN F. KORACIN DATE 29 NOV 62 CHECKED J. Taylor 14 DEC 62 APPROVAL J. Hamm 14 DEC 62 APPROVAL A. Hodel 16 DEC 62	MANNED SPACECRAFT CENTER HOUSTON, TEXAS PAD-IMU MOUNTING LEFT HAND FRONT
NEXT ASSY	USED ON	MATERIAL 1▷ J. Simis 14 Dec 62	1-23-63 NASA APPROVAL W J Rhine	CODE IDENT NO. SIZE D 1899957
APPLICATION		CONTRACT NAS-9-497	R. Geer MIT APPROVAL 23 Jan 63	SCALE 1:1 SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ E		UPGRADED FOR CLASS A RELEASE TDRR 01080		27. APR. 63	A.J.F. / W
F4		REVISED IN ACCORDANCE WITH TORR 01500		26 June 63	W

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324, COND. A. Ⓕ1

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

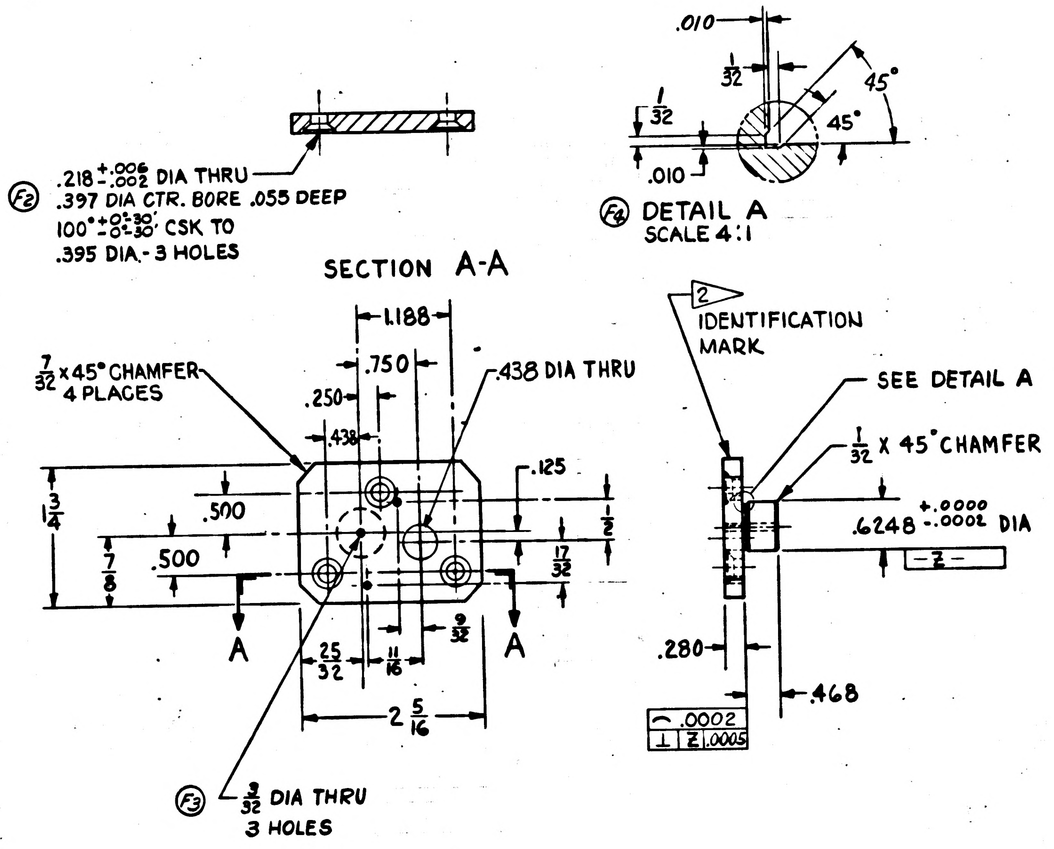
UNLESS OTHERWISE SPECIFIED:

ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.

SURFACE ROUGHNESS SHALL NOT EXCEED 63✓ AA.

MUST BE FREE FROM BURRS.
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-1150.

2▷ IDENTIFY USING DRAWING NO AND REVISION LETTER PER MIL-STD-130.


Ⓕ2 .218 +.006 -.002 DIA THRU
.397 DIA CTR. BORE .055 DEEP
100° +0°30' -0°30' CSK TO
.395 DIA.- 3 HOLES
SECTION A-A
.010
1/32
45°
45°
1/32
.010
Ⓕ4 DETAIL A
SCALE 4:1
1.188
.750
.250
.438
7/32 x45° CHAMFER 4 PLACES
.438 DIA THRU
.125
1 3/4
.500
7/8
.500
1/2
17/32
A
A
25/32
11/16
9/32
2 5/16
Ⓕ3 3/32 DIA THRU 3 HOLES
2▷ IDENTIFICATION MARK
SEE DETAIL A
1/32 X 45° CHAMFER
.6248 +.0000 -.0002 DIA
-Z-
.280
.468
⌒ .0002
⊥ Z .0005

00298

23 Jan 1963

1899966	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES +2° -2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN F. KORACIN DATE 29 NOV 62 CHECKED J. Jaylor 14 DEC 62 APPROVAL J. Hayes 14 DEC 62 APPROVAL A. Hodel 14 DEC 62	MANNED SPACECRAFT CENTER HOUSTON, TEXAS PAD-IMU MOUNTING LEFT HAND FRONT
NEXT ASSY	USED ON	MATERIAL 1▷ 14 Dec 62	1-23-63 NASA APPROVAL R. Sears MIT APPROVAL 23 Jan 63	CODE IDENT NO. SIZE D 1899957
APPLICATION		CONTRACT NAS-9-497		SCALE 1:1 SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

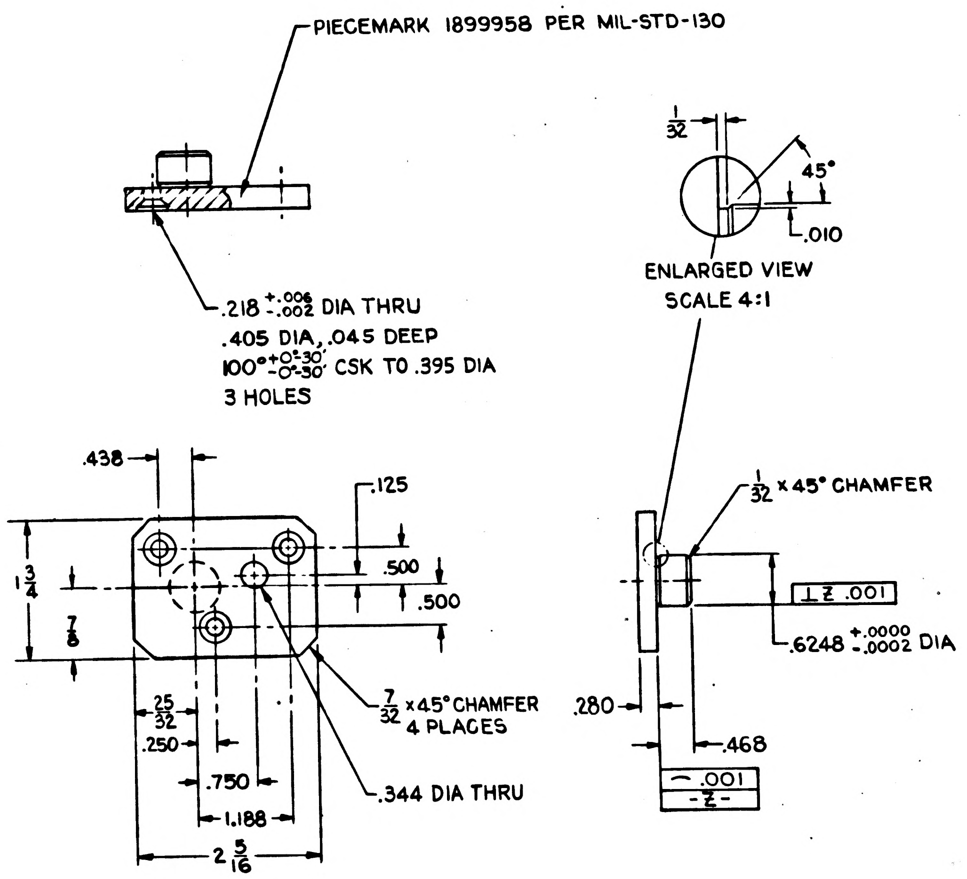
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A2		(A1) MATL. WAS "QQ-763, CLASS 416, COND. A" (A2) HARDNESS NOTE ADDED	D.O. 51265	8 JAN 63	L.C.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

1▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324.
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-900 TO Rc 40-45.
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS MUST BE .005 - .015 RADIUS OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63/AA.

MUST BE FREE FROM BURRS.


PIECEMARK 1899958 PER MIL-STD-130
.218 +.004 -.002 DIA THRU
.405 DIA, .045 DEEP
100° +0°-30' -0°-30' CSK TO .395 DIA
3 HOLES
1/32
45°
.010
ENLARGED VIEW
SCALE 4:1
.438
.125
.500
.500
1 3/4
7/8
25/32
.250
.750
1.188
2 5/16
7/32 x 45° CHAMFER
4 PLACES
.344 DIA THRU
1/32 x 45° CHAMFER
⊥ Z .001
.6248 +.0000 -.0002 DIA
.280
.468
⏤ .001
-Z-

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 20298 **DATE** 23 Jan 1963

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES +2° -2°	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DO NOT SCALE THIS DRAWING	DRAWN L. Cooper DATE 30 NOV 62 CHECKED 14 DEC 62 APPROVAL 14 DEC 62 APPROVAL 14 DEC 62	PAD-IMU MOUNTING, RIGHT HAND FRONT	
MATERIAL 1▷ 14 Dec 62	NASA APPROVAL 1-23-63	CODE IDENT NO.	SIZE D — 1899958
CONTRACT	MIT APPROVAL 23 Jan 63	SCALE 1:1	SHEET

NEXT ASSY	USED ON
APPLICATION	

MIL 10770-P

E 1899958

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		UPGRADED FOR CLASS A RELEASE TDRR 0109		27-APR-63	A.J.F. / W.P.

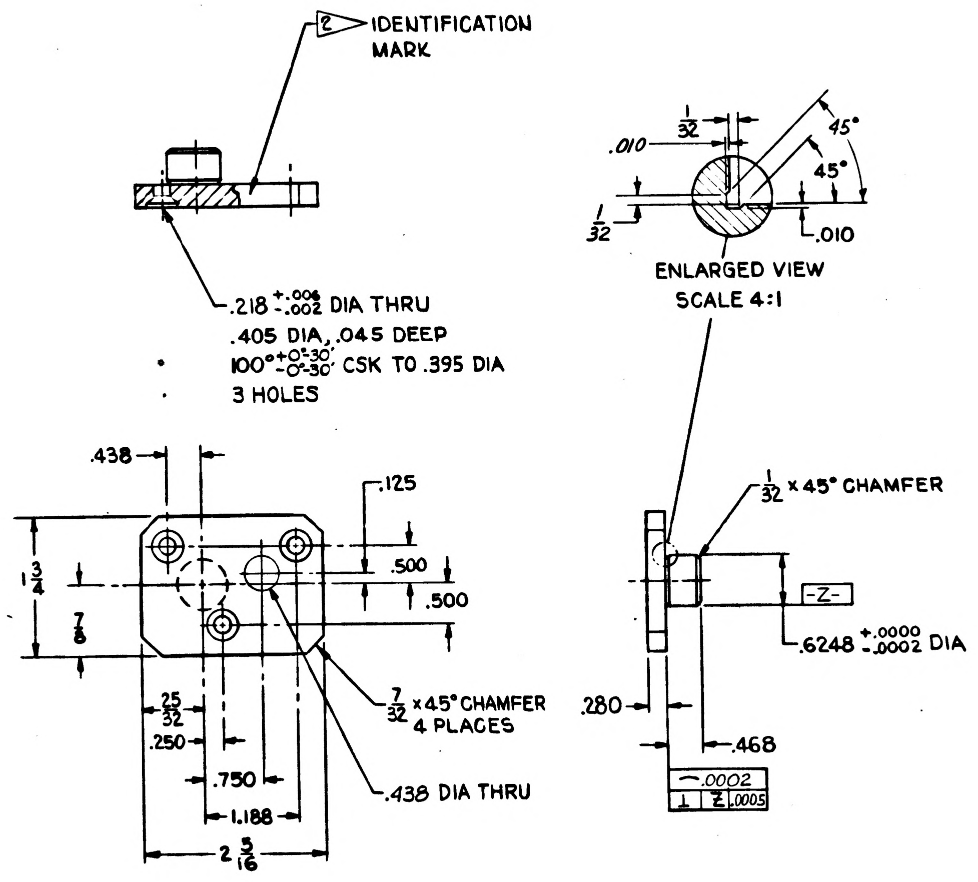
INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324.
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-1150.
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072
(SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS MUST BE .005 - .015 RADIUS
OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63

MUST BE FREE FROM BURRS.

2 IDENTIFY USING DRAWING NO AND REVISION LETTER
PER MIL-STD-130.


2 IDENTIFICATION MARK
.218 +.006 -.002 DIA THRU
.405 DIA, .045 DEEP
100° +0°30' -0°30' CSK TO .395 DIA
3 HOLES
1/32
.010
45°
45°
1/32
.010
ENLARGED VIEW
SCALE 4:1
.438
.125
1 3/4
.500
.500
7/8
1/32 x 45° CHAMFER
-Z-
.6248 +.0000 -.0002 DIA
7/32 x 45° CHAMFER
4 PLACES
25/32
.250
.750
1.188
2 5/16
.438 DIA THRU
.280
.468
.0002
⊥ Z .0005

00298
23 Jan 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+ 2°
- 1/64	-.005	- 2°

DO NOT SCALE THIS DRAWING

MATERIAL 1
J. Simis 14 Dec 62
CONTRACT NAS-9-947

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. Cooper DATE 30 NOV 62
CHECKED J. Gaylor 14 DEC 62
APPROVAL J. Hanna 14 DEC '62
APPROVAL [illegible] 14 DEC 62
NASA APPROVAL W. J. Rhine 2-23-63
R. Gross
MIT APPROVAL [illegible] 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD-IMU MOUNTING,
RIGHT HAND FRONT

CODE IDENT NO.
SIZE D
1899958
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F 1899958 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ E		UPGRADED FOR CLASS A RELEASE TDRR U108		27-APR-63	A.J.F.
F4		REVISED IN ACCORDANCE WITH TORR 0501		20 June 63	

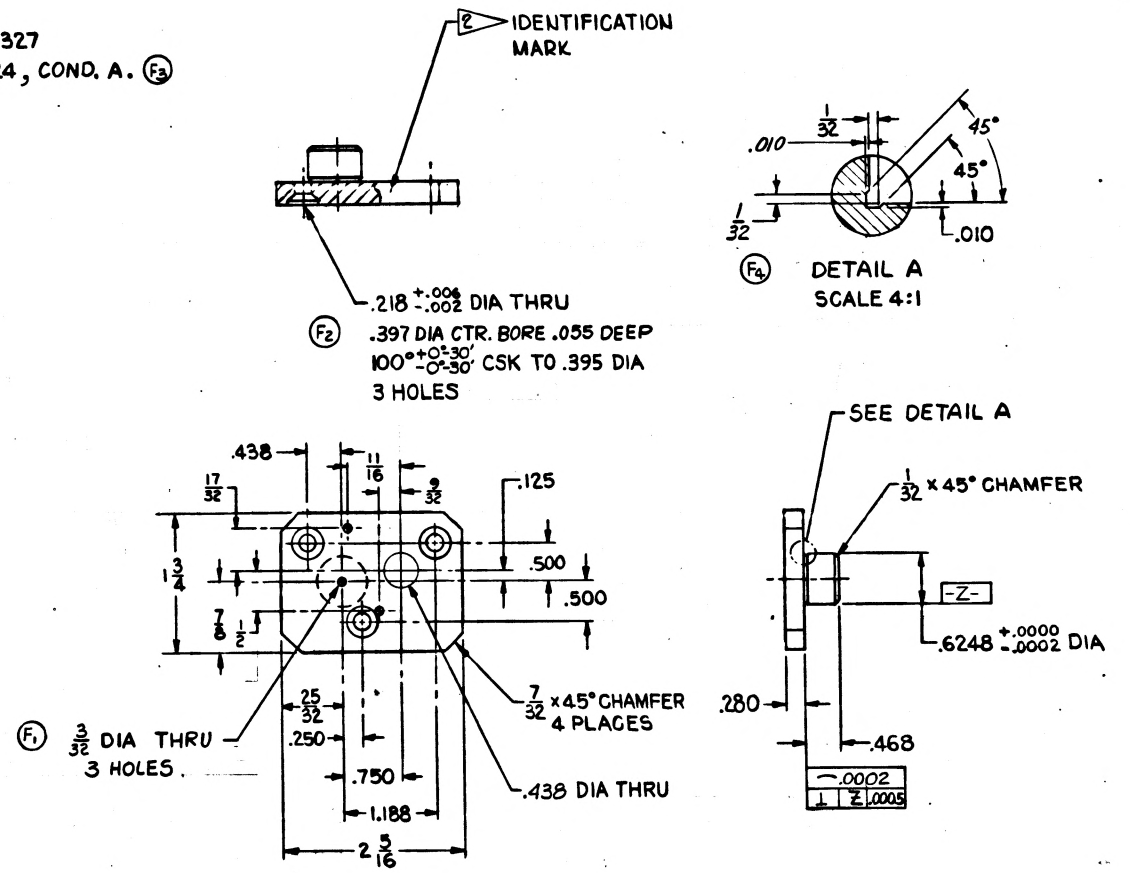
INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

1▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324, COND. A. (F3)
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-1150.
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072
(SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS MUST BE .005 - .015 RADIUS
OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63√.

MUST BE FREE FROM BURRS.

2▷ IDENTIFY USING DRAWING NO AND REVISION LETTER
PER MIL-STD-130.



2▷ IDENTIFICATION MARK
.218 +.006 -.002 DIA THRU
(F2) .397 DIA CTR. BORE .055 DEEP
100° +0°30' -0°30' CSK TO .395 DIA
3 HOLES
1/32
.010
45°
45°
1/32
.010
(F4) DETAIL A
SCALE 4:1
SEE DETAIL A
1/32 x 45° CHAMFER
-Z-
.6248 +.0000 -.0002 DIA
.280
.468
⌒ .0002
⊥ Z .0005
.438
17/32
11/16
9/32
.125
1 3/4
.500
.500
7/8
1/2
(F1) 3/32 DIA THRU 3 HOLES.
25/32
.250
.750
1.188
2 5/16
7/32 x 45° CHAMFER 4 PLACES
.438 DIA THRU

00298
23 Jan 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± 1/64	±.005	±2°

DO NOT SCALE THIS DRAWING

MATERIAL 1▷
14 Dec 62
CONTRACT NAS-9-947

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. Cooper DATE 30 Nov 62
CHECKED 14 DEC 62
APPROVAL 14 DEC 62
APPROVAL 14 DEC 62
NASA APPROVAL 1-23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD - IMU MOUNTING,
RIGHT HAND FRONT

CODE IDENT NO.
SIZE D
1899958
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

A 1899959

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A2		(A1) MATL WAS "QQ-S-763, CLASS 416, COND. A". (A2) HARDNESS NOTE ADDED	D.O. 51265	8 JAN 63	L.C.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324. HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-900 TO Rc 40-45.

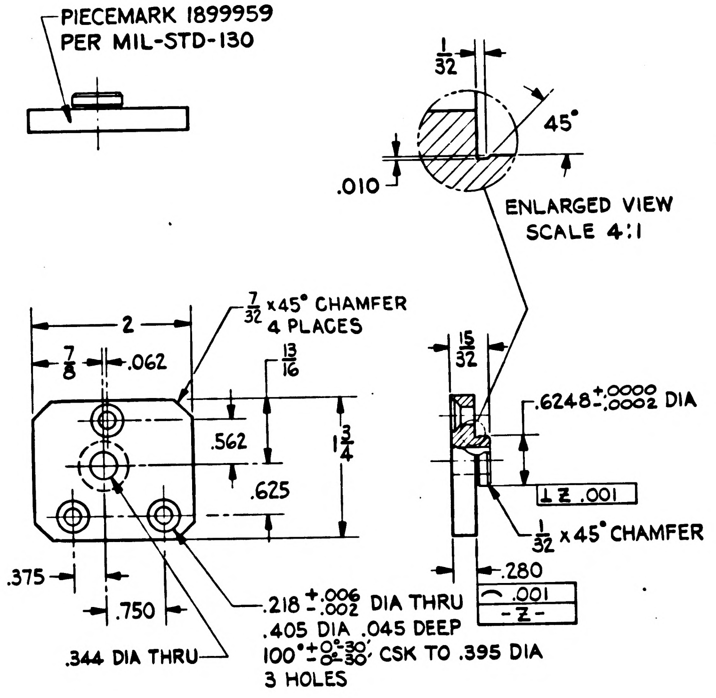
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:

ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.

SURFACE ROUGHNESS IS NOT TO EXCEED 63/AA.

MUST BE FREE FROM BURRS.


PIECEMARK 1899959
PER MIL-STD-130
1/32
45°
.010
ENLARGED VIEW
SCALE 4:1
7/32 x45° CHAMFER
4 PLACES
2
7/8
.062
13/16
.562
1 3/4
.625
15/32
.6248 +.0000 -.0002 DIA
⊥ Z .001
1/32 x 45° CHAMFER
.280
⌒ .001
-Z-
.375
.750
.218 +.006 -.002 DIA THRU
.405 DIA .045 DEEP
100° +0°30' -0°30' CSK TO .395 DIA
3 HOLES
.344 DIA THRU

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 DATE 23 Jan 1963

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL 1
14 Dec 62
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C. LENZ DATE 30 NOV '62
CHECKED 14 DEC 62
APPROVAL J. Hanna 14 Dec '62
APPROVAL 16 DEC 62
NASA APPROVAL 1-23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD-IMU MOUNTING
LEFT HAND. REAR

CODE IDENT NO.
SIZE D
1899959
SCALE FULL
SHEET

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		UPGRADED FOR CLASS A RELEASE TDRR 01082		27-APR-63	A.J.F.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

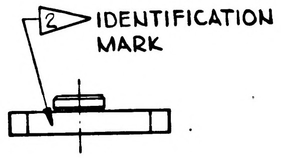
1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-1150.

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C)
FINISH E-300.

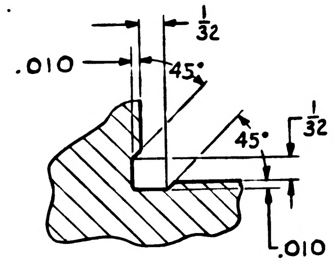
UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS IS NOT TO EXCEED 63

MUST BE FREE FROM BURRS.

2 IDENTIFY USING DRAWING Nº AND REVISION LETTER PER MIL-STD-130.

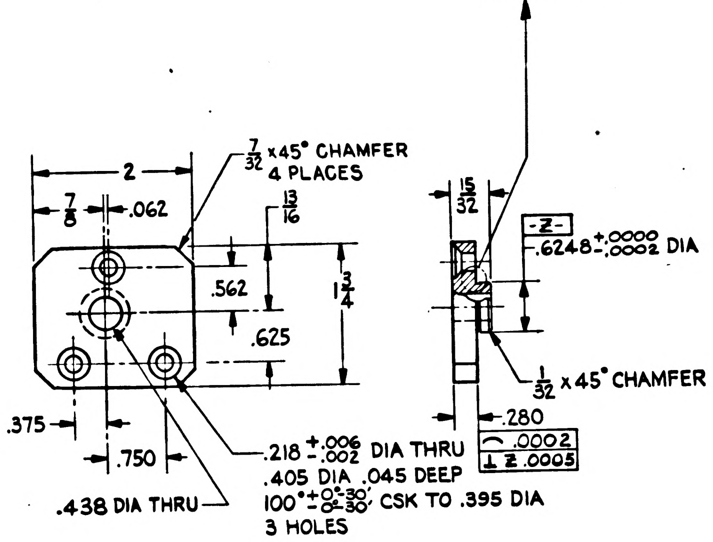


2 IDENTIFICATION MARK



.010
1/32
45°
45°
1/32
.010

ENLARGED VIEW
SCALE 10:1



2
7/8
.062
7/32 x45° CHAMFER 4 PLACES
13/16
.562
1 3/4
.625
.375
.750
.438 DIA THRU
.218 +.006 -.002 DIA THRU .405 DIA .045 DEEP 100° +0°-30' -0°-30' CSK TO .395 DIA 3 HOLES
15/32
-Z-
.6248 +.0000 -.0002 DIA
1/32 x45° CHAMFER
.280
.0002
⊥ Z .0005

00298
23 Jan 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+ 2°
− 1/64	−.005	− 2°

DO NOT SCALE THIS DRAWING
MATERIAL 1
J. Johnson 14 Dec 62
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C. LENZ DATE 30 NOV '62
CHECKED 14 DEC 62
APPROVAL J. Hanson 14 Dec '62
APPROVAL 14 Dec 62
NASA APPROVAL W J Rhine 1-23-63
R. Gass
MIT APPROVAL W Kupfer 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD-IMU MOUNTING
LEFT HAND REAR

CODE IDENT NO.
SIZE D
1899959
SCALE FULL
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

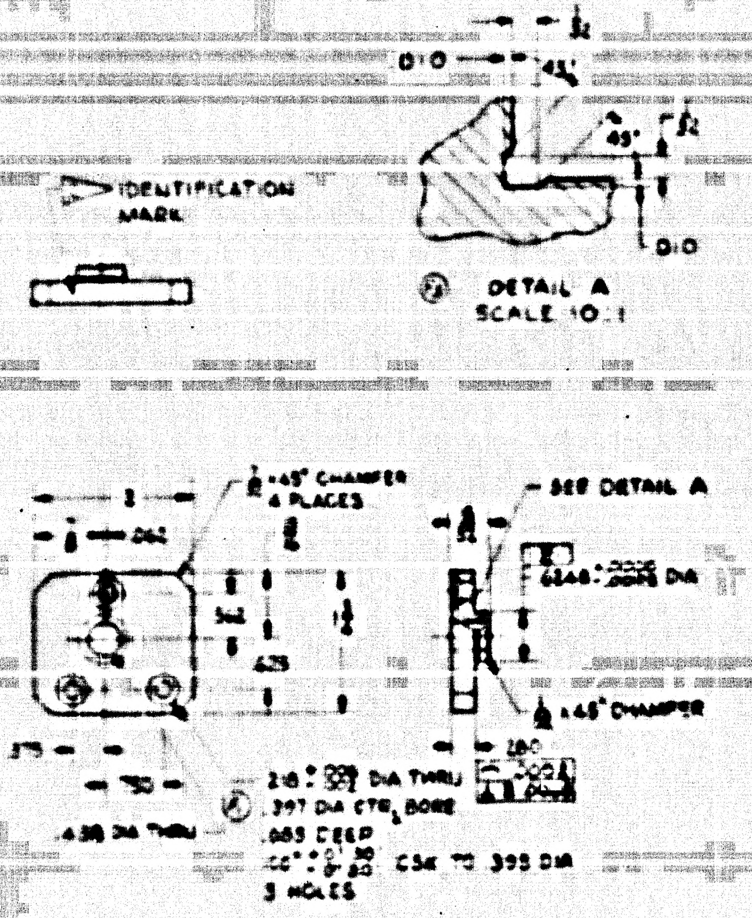
MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 304, COND A.
HARDEN PER MIL-H-6875 [illegible] COND [illegible]

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-P-14072 (S/S C)
FINISH E-300.

UNLESS OTHERWISE SPECIFIED.
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER
SURFACE ROUGHNESS IS NOT TO EXCEED 63

MUST BE FREE FROM BURRS

IDENTIFY USING DRAWING NO AND REVISION
LETTER PER MIL-STD-130.



IDENTIFICATION MARK
.010
45°
.010
DETAIL A
SCALE 10:1
1/64 x 45° CHAMFER 4 PLACES
SEE DETAIL A
.062
.562
.625
.6448 DIA
1/64 x 45° CHAMFER
.375
.750
.438 DIA THRU
.218 DIA THRU
.397 DIA CTR BORE
.065 DEEP
100° CSK TO .395 DIA
3 HOLES
.280

PAD-IMU MOUNTING

D 1899959

∀ 0966681 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
(N) A2		(A1) MATL WAS "QQ-S-763, CLASS 416, COND A". (A2) HARDNESS NOTE ADDED	D.O. 51265	8 JAN 63	L.C.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

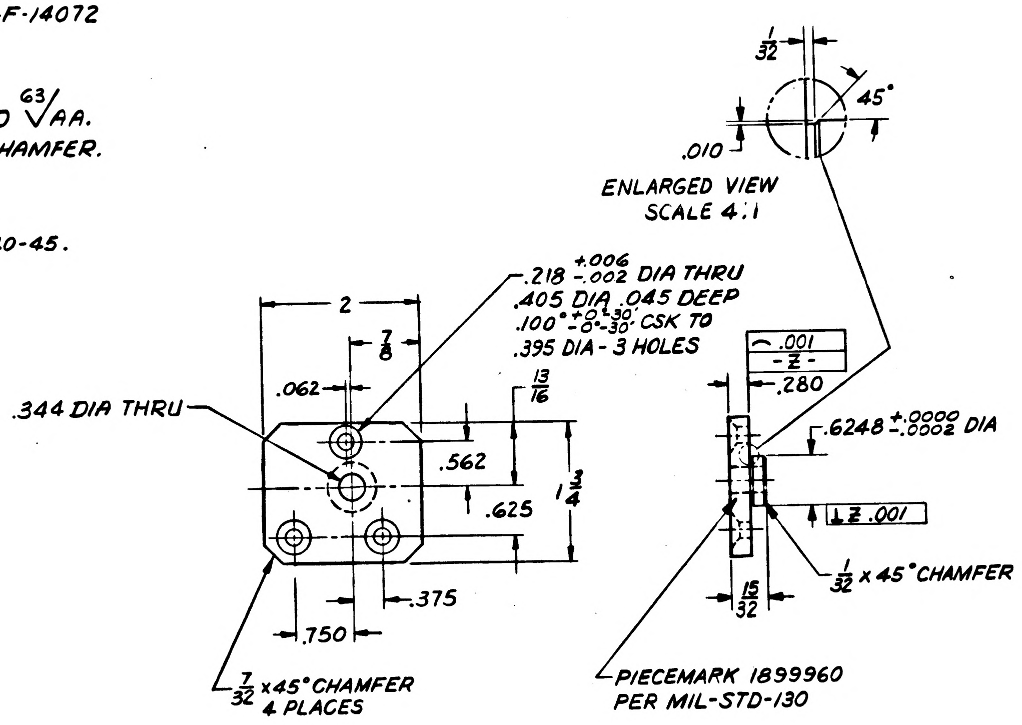
UNLESS OTHERWISE SPECIFIED:

SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\surd}$AA.

ALL CORNERS MUST BE .005 TO .015 R OR CHAMFER.

MUST BE FREE FROM BURRS.

HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-900 TO Rc 40-45.


1/32
45°
.010
ENLARGED VIEW
SCALE 4:1
2
7/8
.062
.344 DIA THRU
.218 +.006 -.002 DIA THRU
.405 DIA .045 DEEP
.100° +0°30' -0°-30' CSK TO
.395 DIA - 3 HOLES
13/16
.562
.625
1 3/4
.375
.750
7/32 x45° CHAMFER 4 PLACES
.001
- Z -
.280
.6248 +.0000 -.0002 DIA
⊥ Z .001
1/32 x 45° CHAMFER
15/32
PIECEMARK 1899960
PER MIL-STD-130

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 DATE 23 Jan 1963

NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+ 2°
- 1/64	-.005	- 2°

DO NOT SCALE THIS DRAWING

MATERIAL ▷

J. Amies 14 Dec 62

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN FRIEDE DATE 30 Nov 62
CHECKED J. Saylor 14 DEC 62
APPROVAL J. Hamm 14 DEC '62
APPROVAL A. Hodel 14 DEC 62
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL W Kupfer 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD- IMU MOUNTING
RIGHT HAND REAR

CODE IDENT NO. | SIZE D | 1899960

SCALE FULL | SHEET

3 0966681 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
E		UPGRADED FOR CLASS A RELEASE DRR 01083		27 APR. 63	A.J.F.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1 ▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324

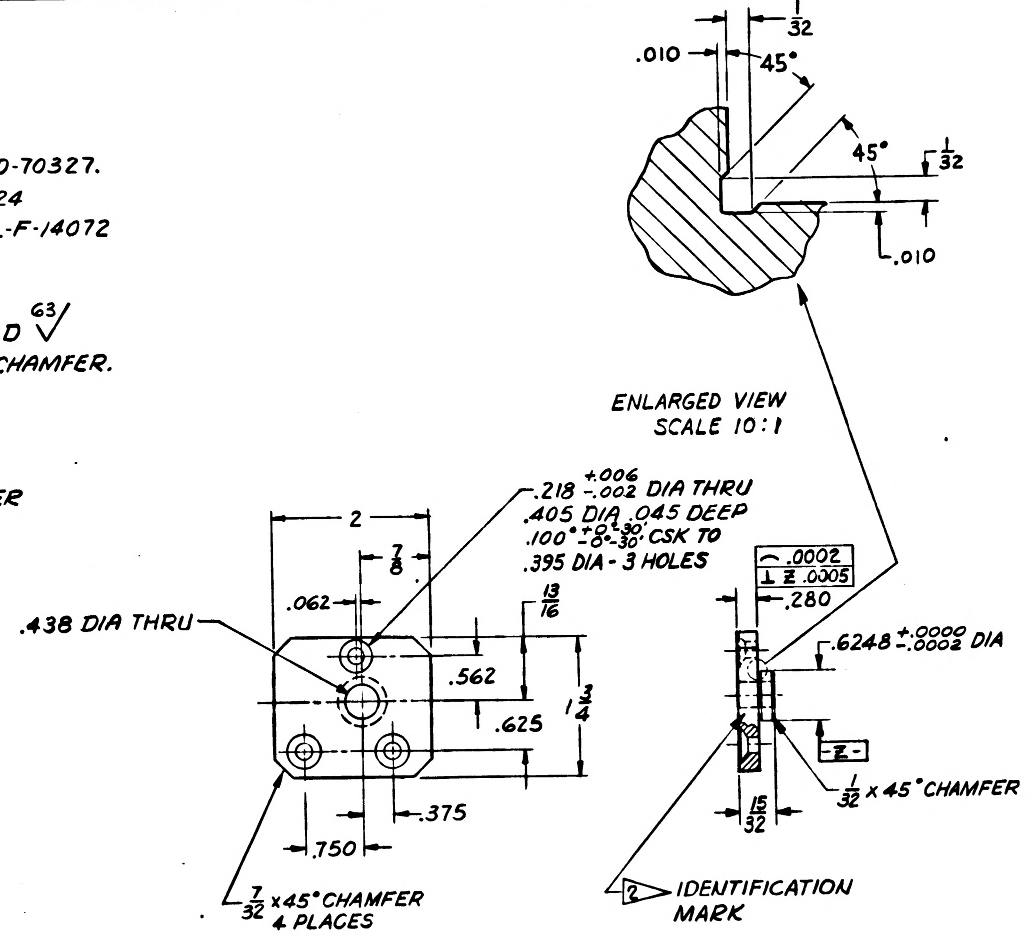
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
SURFACE ROUGHNESS SHALL NOT EXCEED 63√
ALL CORNERS MUST BE .005 TO .015 R OR CHAMFER.

MUST BE FREE FROM BURRS.

HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-1150.

2 ▷ IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130.



.010
1/32
45°
45°
1/32
.010
ENLARGED VIEW SCALE 10:1
2
7/8
.062
.438 DIA THRU
.218 +.006 -.002 DIA THRU .405 DIA .045 DEEP .100° +0°30' -0°30' CSK TO .395 DIA - 3 HOLES
13/16
.562
.625
1 3/4
.375
.750
7/32 x 45° CHAMFER 4 PLACES
.0002
⊥ Z .0005
.280
.6248 +.0000 -.0002 DIA
-Z-
1/32 x 45° CHAMFER
15/32
2 ▷ IDENTIFICATION MARK

00298
23 Jan 1963

NEXT ASSY	USED ON
1899966	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+ 2°
− 1/64	−.005	− 2°

DO NOT SCALE THIS DRAWING
MATERIAL 1 ▷
J. Amies 14 Dec 62
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 30 Nov 62
CHECKED J. Sayles 14 DEC 62
APPROVAL J. Hann 14 DEC '62
APPROVAL A. Friedel 14 DEC 62
NASA APPROVAL W.J. Rhine 1-27-63
MIT APPROVAL R. Bras W. Kupfer 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD- IMU MOUNTING
RIGHT HAND REAR

CODE IDENT NO. | SIZE D | 1899960
SCALE FULL | SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F 0966681 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		UPGRADED FOR CLASS A RELEASE TDRR 01083		27 APR 63	A.J.F.
F3		REVISED IN ACCORDANCE WITH TDRR 01503			

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324, COND. A. (F2)

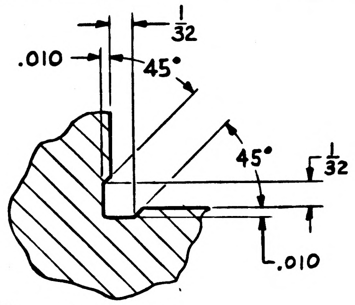
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
SURFACE ROUGHNESS SHALL NOT EXCEED 63√
ALL CORNERS MUST BE .005 TO .015 R OR CHAMFER.

MUST BE FREE FROM BURRS.

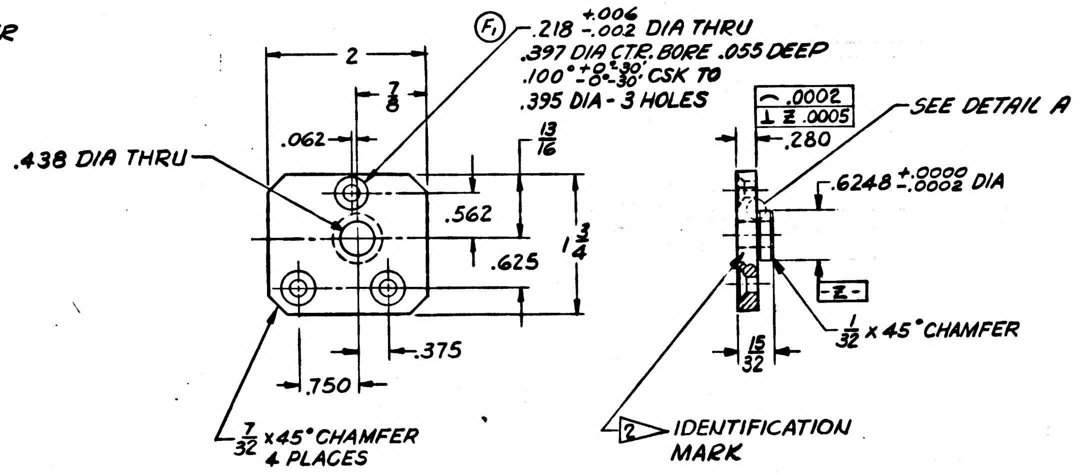
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-1150.

2▷ IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130.



.010
1/32
45°
45°
1/32
.010

(F3) DETAIL A
SCALE 10:1



(F1) .218 +.006 -.002 DIA THRU
.397 DIA CTR. BORE .055 DEEP
.100° +0°30' -0°-30' CSK TO
.395 DIA - 3 HOLES
2
7/8
.062
.438 DIA THRU
13/16
.562
.625
1 3/4
.375
.750
7/32 x45° CHAMFER 4 PLACES
.0002
⊥ Z .0005
.280
SEE DETAIL A
.6248 +.0000 -.0002 DIA
-Z-
1/32 x 45° CHAMFER
15/32
2▷ IDENTIFICATION MARK

00298
23 Jan 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+ 2°
- 1/64	-.005	- 2°

DO NOT SCALE THIS DRAWING
MATERIAL 1▷
J. Simis 14 Dec 62
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 30 Nov 62
CHECKED J. Saylor 14 DEC 62
APPROVAL J. Hamm 14 DEC '62
APPROVAL A.P. Kodzel 14 Dec 62
NASA APPROVAL W.J. Adams 1-27-63
MIT APPROVAL R. Bras W. Kupfer 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PAD- IMU MOUNTING
RIGHT HAND REAR

CODE IDENT NO.
SIZE D
1899960
SCALE FULL
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10770-F

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324.

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:

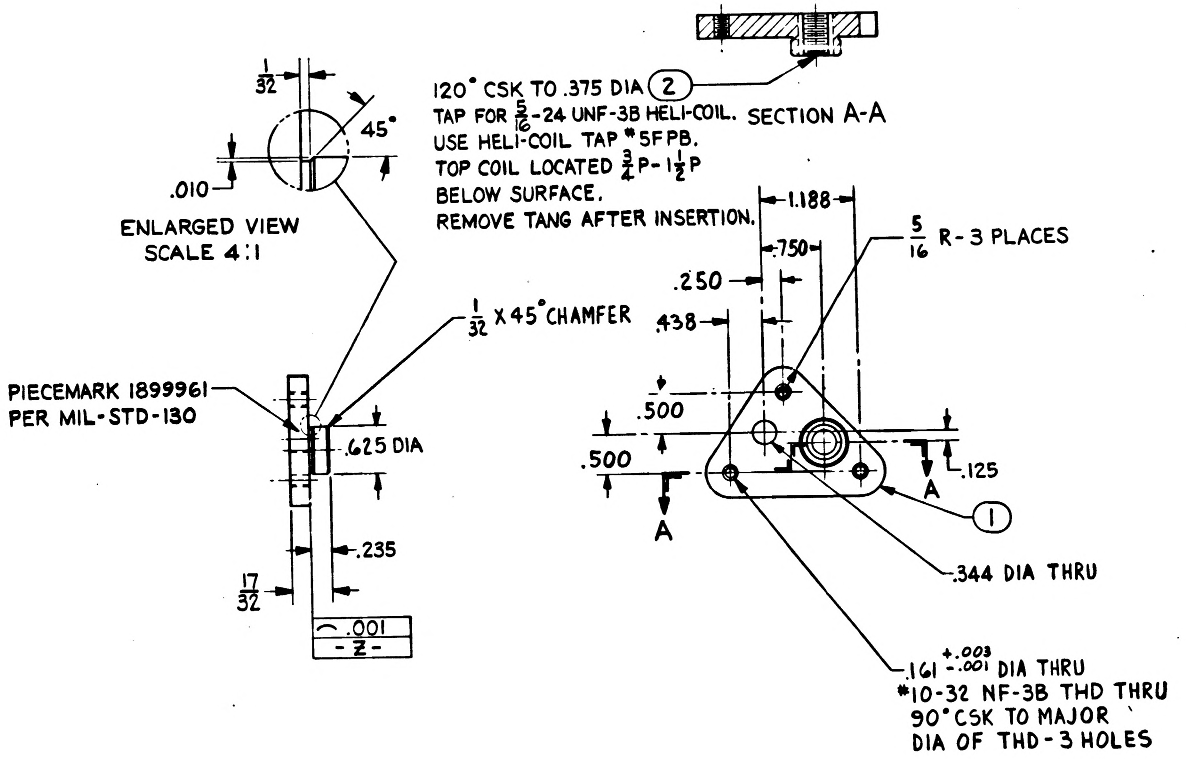
ALL CORNERS TO HAVE .005 TO .015 RADIUS OR CHAMFER.

SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\checkmark}$ AA.

MUST BE FREE FROM BURRS.

HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-900 TO Rc 40-45.

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) A2		(A1) MATL WAS "QQ-S-763, CLASS 416, COND. A". (A2) HARDNESS NOTE ADDED.	D.O. 51265	8 JAN 63	L.C.



1/32
45°
.010
ENLARGED VIEW
SCALE 4:1
120° CSK TO .375 DIA (2)
TAP FOR 5/16-24 UNF-3B HELI-COIL.
USE HELI-COIL TAP #5FPB.
TOP COIL LOCATED 3/4P-1 1/2P
BELOW SURFACE.
REMOVE TANG AFTER INSERTION.
SECTION A-A
1.188
.750
5/16 R-3 PLACES
.250
.438
1/32 X 45° CHAMFER
PIECEMARK 1899961
PER MIL-STD-130
.625 DIA
.500
.500
.125
A
A
(1)
.344 DIA THRU
.235
17/32
⌒ .001
-Z-
.161 +.003 -.001 DIA THRU
#10-32 NF-3B THD THRU
90° CSK TO MAJOR
DIA OF THD-3 HOLES

ITEM NO.	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	1	MS21209-F5-15	HELI-COIL, SELF-LOCKING 5/16-24 UNF-3B
1	1	1899961-001	PLATE

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. CO 298 23 Jan 1963 DATE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL ▷
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN DATE 30 NOV 62
CHECKED Saylor 14 DEC 62
APPROVAL J. Hanna 14 DEC 62
APPROVAL 14 DEC 62
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE, BACK-UP
LEFT HAND FRONT

CODE IDENT NO.
SIZE D
1899961
SCALE 1:1
SHEET

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324 COND-A.
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072
(SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:

ALL CORNERS TO HAVE .005 TO .015 RADIUS OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63✓

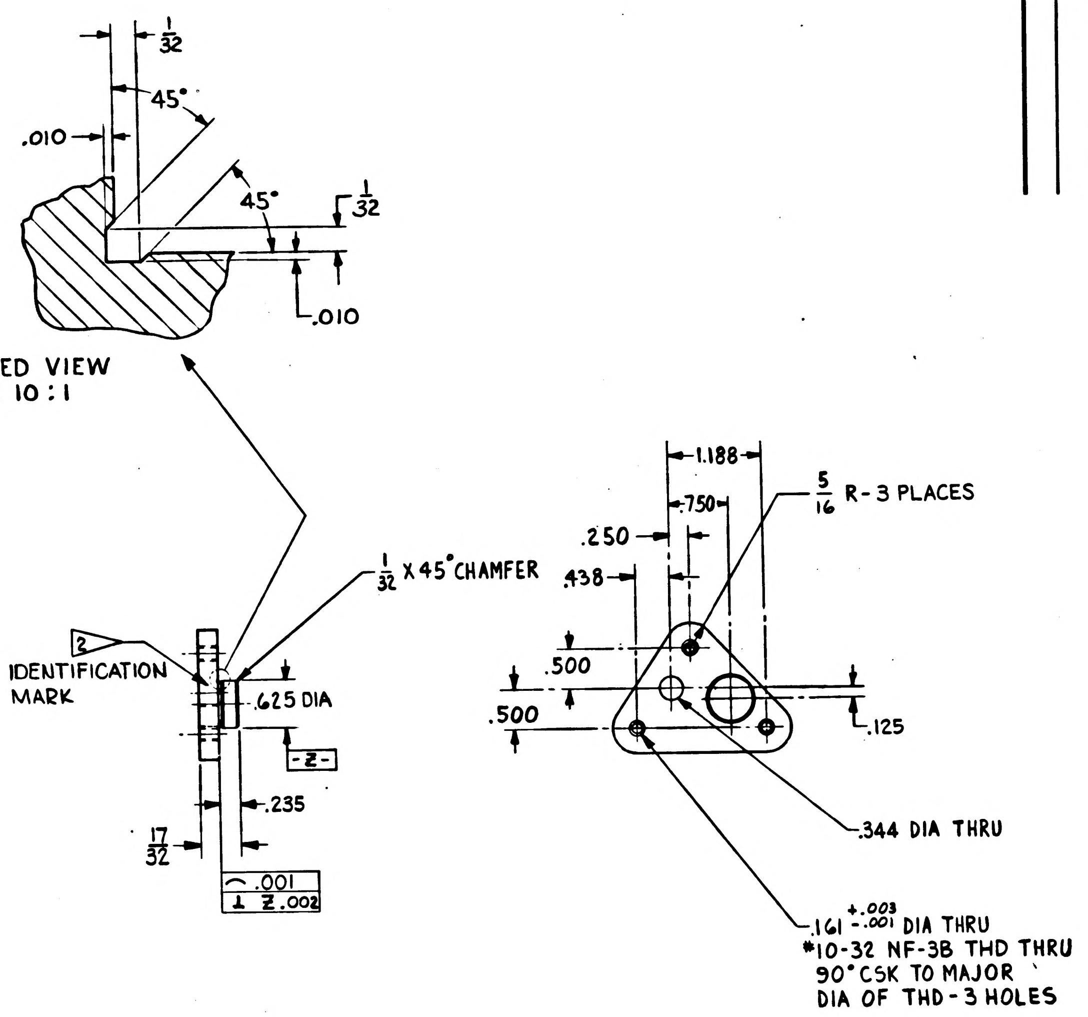
MUST BE FREE FROM BURRS.

2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

1966681 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS A RELEASE TDRR U1084		27-APR-63	


1/32
.010
45°
45°
1/32
.010
ENLARGED VIEW
SCALE 10:1
1/32 X 45° CHAMFER
2
IDENTIFICATION MARK
.625 DIA
-Z-
.235
17/32
⌒ .001
⊥ Z .002
1.188
.750
5/16 R-3 PLACES
.250
.438
.500
.500
.125
.344 DIA THRU
.161 +.003 -.001 DIA THRU
#10-32 NF-3B THD THRU
90° CSK TO MAJOR
DIA OF THD-3 HOLES

00 298 23 Jan 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL 1
E. Amico 14 Dec 62
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. KORACIN DATE 30 NOV 62
CHECKED Saylor 14 DEC 62
APPROVAL J. Hann 14 DEC 62
APPROVAL 14 Dec 62
NASA APPROVAL W. J. Rhine 3-23-63
R. Grass
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE, BACK-UP
LEFT HAND FRONT

CODE IDENT NO.
SIZE D
1899961
SCALE 1:1
SHEET

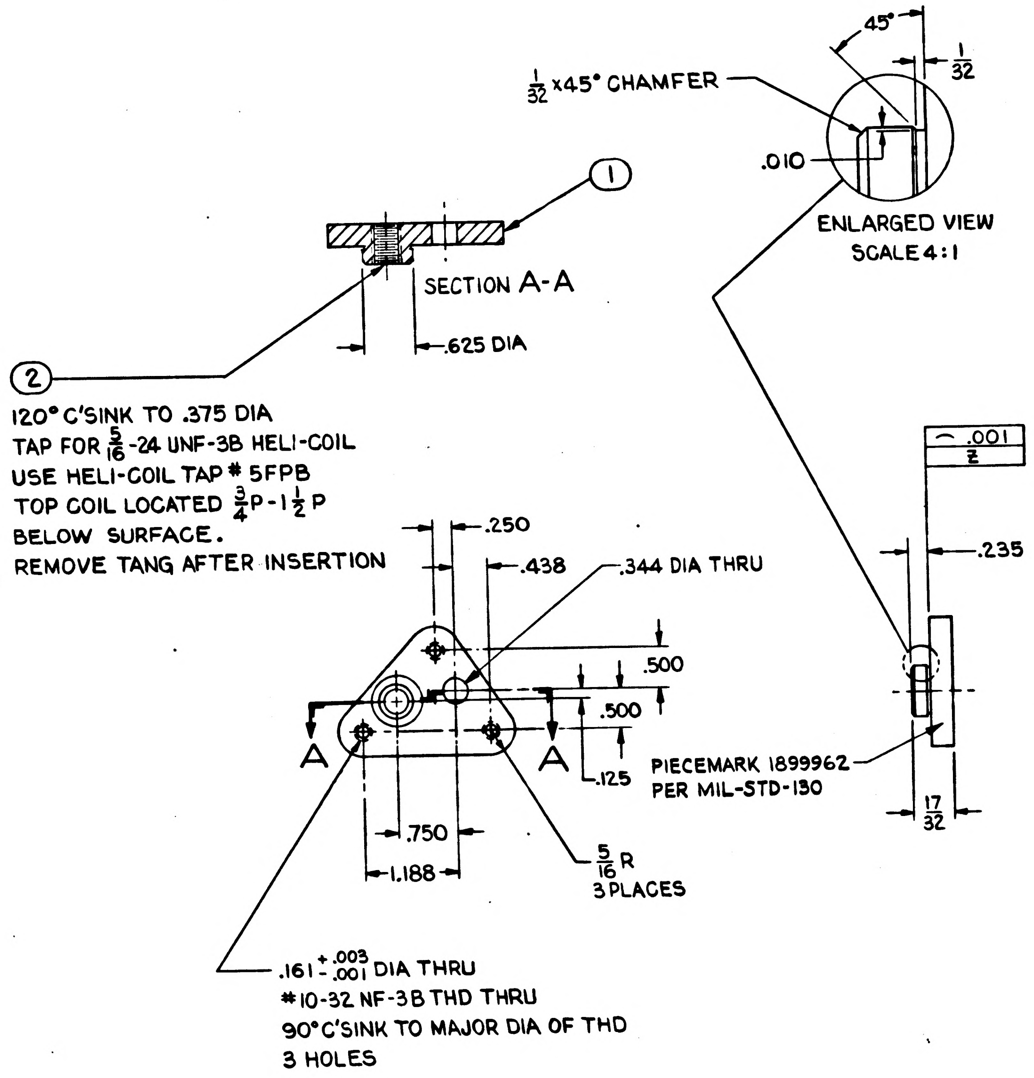
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A2		(A1) MATL WAS "QQ-S-763, CLASS 416, COND A". (A2) HARDNESS NOTE ADDED.	D.O. 51265	8 JAN 63	L.C.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
(1)▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324.
HARDEN PER MIL-H-6875 PER 17-4-PH, COND H-900 TO Rc 40-45.
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072
(SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS MUST BE .005-.015 RADIUS OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63/AA.

MUST BE FREE FROM BURRS.



$\frac{1}{32}$ x45° CHAMFER
45°
$\frac{1}{32}$
.010
ENLARGED VIEW
SCALE 4:1
①
SECTION A-A
.625 DIA
②
120° C'SINK TO .375 DIA
TAP FOR $\frac{5}{16}$-24 UNF-3B HELI-COIL
USE HELI-COIL TAP # 5FPB
TOP COIL LOCATED $\frac{3}{4}$P-1$\frac{1}{2}$P
BELOW SURFACE.
REMOVE TANG AFTER INSERTION
.250
.438
.344 DIA THRU
.500
.500
.125
A
A
.750
1.188
$\frac{5}{16}$R
3 PLACES
.161 $^{+.003}_{-.001}$ DIA THRU
#10-32 NF-3B THD THRU
90° C'SINK TO MAJOR DIA OF THD
3 HOLES
⌒ .001 Z
.235
PIECEMARK 1899962
PER MIL-STD-130
$\frac{17}{32}$

ITEM NO	NO REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	1	MS 21209-F5-15	HELI-COIL-SELF LOCKING 5/16-24UNF-3B
1	1	1899962-001	PLATE

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 DATE 23 Jan 1963

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS $\pm\frac{1}{64}$ DECIMALS $\pm.005$ ANGLES $\pm 2°$
DO NOT SCALE THIS DRAWING
MATERIAL (1)▷
[illegible] 14 Dec 62
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 6 DEC 62
CHECKED J. Saylor 14 DEC 62
APPROVAL J. Hamm 14 Dec '62
APPROVAL [illegible] 14 DEC 62
NASA APPROVAL [illegible] 1-23-63
MIT APPROVAL [illegible] 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE - BACK-UP
RIGHT HAND FRONT

CODE IDENT NO.
SIZE D
1899962
SCALE 1:1
SHEET

MIL 10770-P

1899962 C

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS A RELEASE TDRK 01185		27 APR. 63	A.J.F. / GK

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

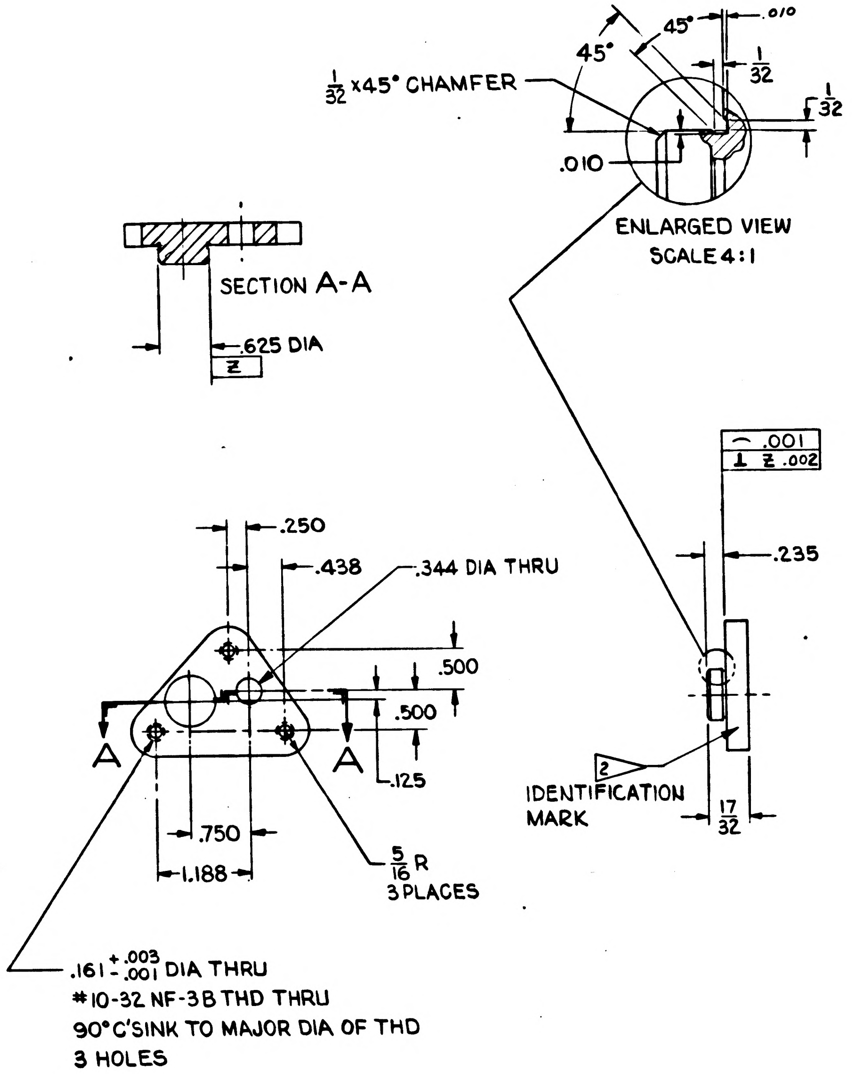
1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324 COND A.

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS MUST BE .005-.015 RADIUS OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63√

MUST BE FREE FROM BURRS.

2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.


45°
45°
.010
1/32
1/32 x45° CHAMFER
1/32
.010
ENLARGED VIEW
SCALE 4:1
SECTION A-A
.625 DIA
Z
.001
⊥ Z .002
.250
.438
.344 DIA THRU
.235
.500
.500
.125
A
A
.750
1.188
5/16 R
3 PLACES
2
IDENTIFICATION MARK
17/32
.161 +.003 -.001 DIA THRU
#10-32 NF-3B THD THRU
90° C'SINK TO MAJOR DIA OF THD
3 HOLES

00298
23 Jan. 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+2°
$-\frac{1}{64}$	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL 1
J. Hann 14 Dec 62
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 6 DEC 62
CHECKED J. Sayles 14 DEC 62
APPROVAL J. HANN 14 DEC '62
APPROVAL 14 DEC 62
NASA APPROVAL 1-23-63
MIT APPROVAL 23 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE - BACK-UP
RIGHT HAND FRONT

CODE IDENT NO. | SIZE D | 1899962
SCALE 1:1 | SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

C 1899963

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS A RELEASE TDRR01086		27 APR 63	A.J.F. / WK

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

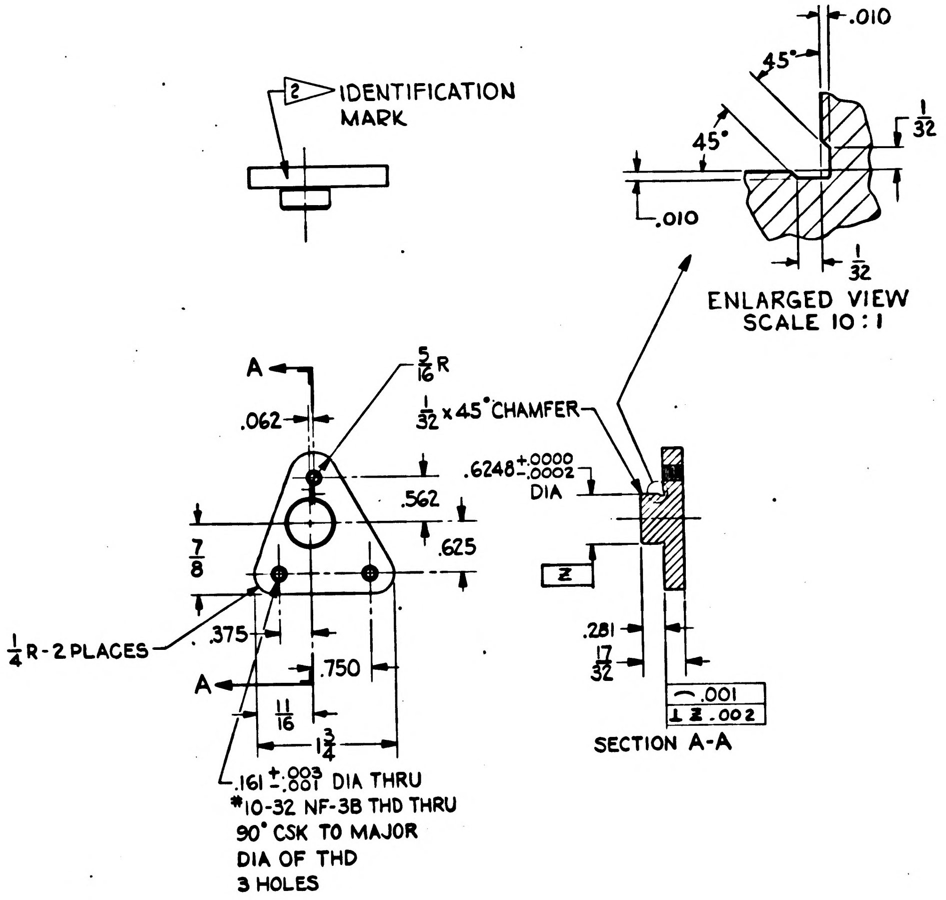
1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324. COND. A.

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C)
FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS NOT TO EXCEED 63

MUST BE FREE FROM BURRS.

2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130



2 IDENTIFICATION MARK
.010
45°
45°
1/32
.010
1/32
ENLARGED VIEW
SCALE 10:1
A
5/16 R
1/32 x 45° CHAMFER
.062
.6248 +.0000 -.0002 DIA
.562
.625
7/8
Z
1/4 R-2 PLACES
.375
.750
A
11/16
1 3/4
.281
17/32
⌒ .001
⊥ Z .002
SECTION A-A
.161 +.003 -.001 DIA THRU
*10-32 NF-3B THD THRU
90° CSK TO MAJOR
DIA OF THD
3 HOLES

00298
23 Jan 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING
MATERIAL 1
J. Smis 14 Dec 62
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C. LENZ DATE 30 NOV '62
CHECKED J. Sayles 14 DEC 62
APPROVAL J. Hanna 14 DEC 62
APPROVAL 14 DEC 62
NASA APPROVAL W. J. Robins 1-23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE - BACK UP
LEFT HAND REAR

CODE IDENT NO.
SIZE D
1899963
SCALE FULL
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS A RELEASE TDRR 01086		27 APR 63	A.J.F. / WK
D3		REVISED IN ACCORDANCE WITH TORR 01506		26 June 63	WK

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

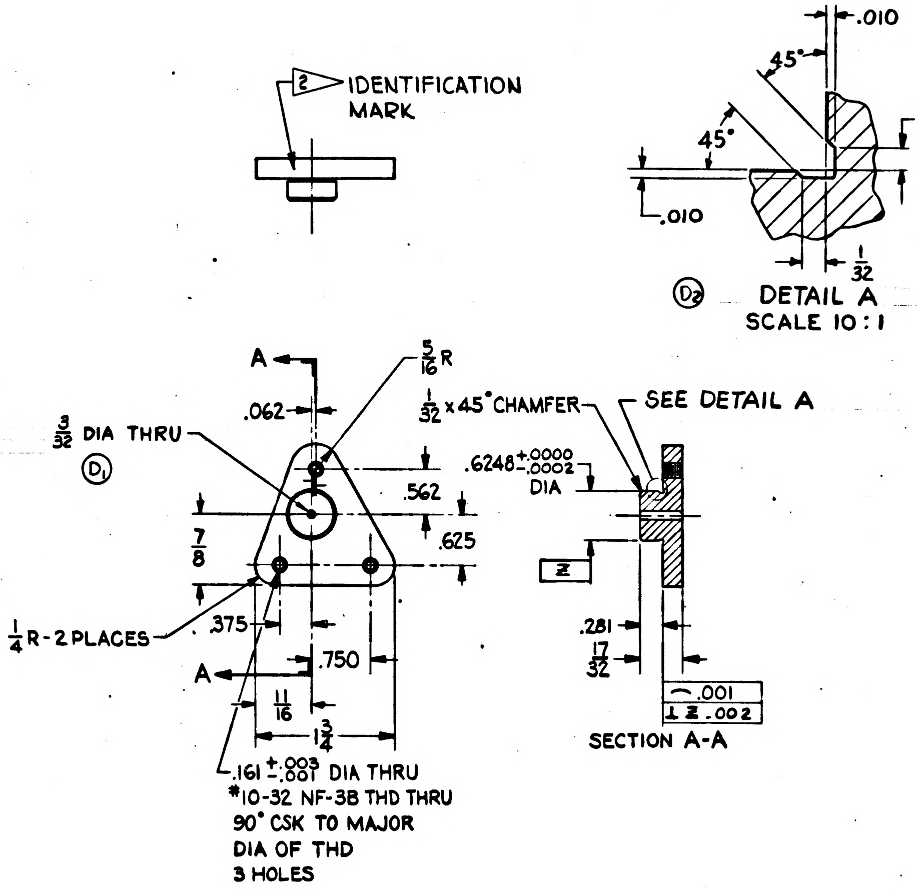
① MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324
OR CLASS 303, COND A (D2)

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C)
FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS NOT TO EXCEED 63√

MUST BE FREE FROM BURRS.

② IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130



② IDENTIFICATION MARK
45°
45°
.010
.010
1/32
1/32
(D2) DETAIL A
SCALE 10:1
A
5/16 R
.062
3/32 DIA THRU
(D1)
1/32 x 45° CHAMFER
SEE DETAIL A
.6248 +.0000 −.0002 DIA
.562
.625
7/8
1/4 R - 2 PLACES
.375
.750
A
11/16
1 3/4
.161 +.003 −.001 DIA THRU
#10-32 NF-3B THD THRU
90° CSK TO MAJOR
DIA OF THD
3 HOLES
Z
.281
17/32
⌒ .001
⊥ Z .002
SECTION A-A

00298
23 Jan 1963

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±2°	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DO NOT SCALE THIS DRAWING	DRAWN C. LENZ DATE 30 NOV '62 CHECKED Hayden 14 DEC 62 APPROVAL J. Hanna 14 DEC 62 APPROVAL Model 14 DEC 62	PLATE - BACK UP LEFT HAND REAR	
MATERIAL ① J. Smith 14 Dec 62	NASA APPROVAL W. J. Robinson 1-23-63 R. Gross MIT APPROVAL W. S. Pepper 23 Jan 63	CODE IDENT NO.	SIZE D 1899963
CONTRACT NAS-9-497		SCALE FULL	SHEET

NEXT ASSY	USED ON
1899966	1899950-011

APPLICATION

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) A2		(A1) MATL WAS "QQ-S-763, CLASS 416, COND A". (A2) HARDNESS NOTE ADDED.	D.C 51265	8 JAN 63	L.C.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

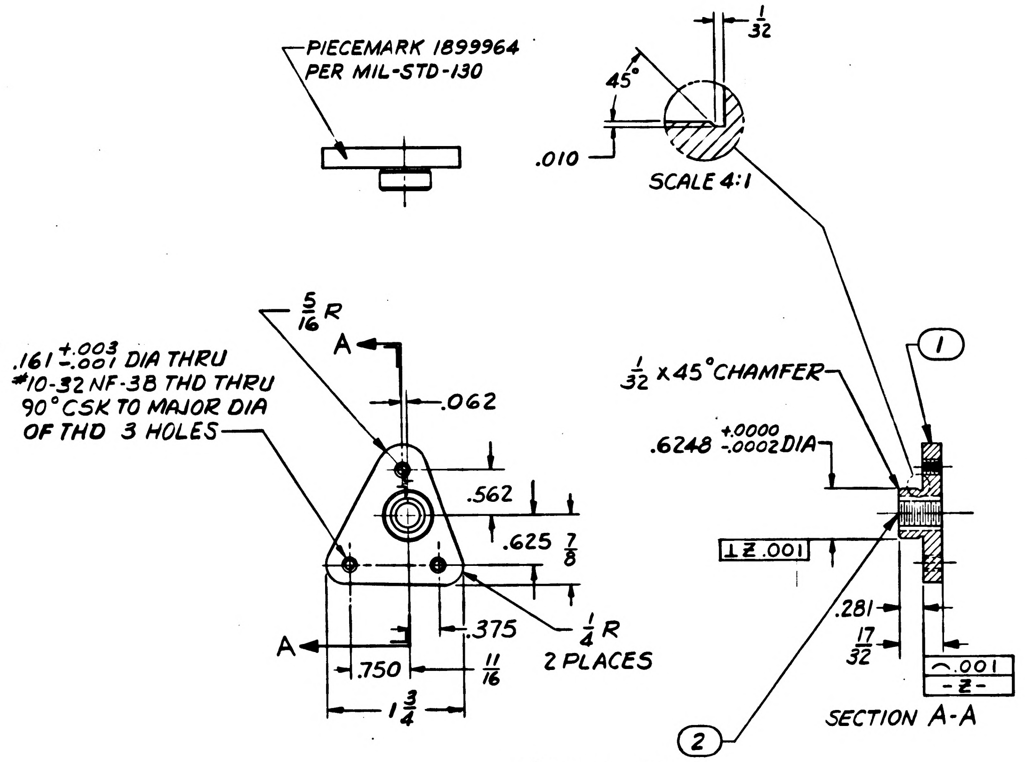
1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324.

FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

HARDED PER MIL-H-6875 PER 17-4-PH, COND H-900 TO Rc 40-45.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS NOT TO EXCEED 63√ AA.

MUST BE FREE FROM BURRS.


PIECEMARK 1899964
PER MIL-STD-130
1/32
45°
.010
SCALE 4:1
5/16 R
A
.161 +.003 -.001 DIA THRU
#10-32 NF-3B THD THRU
90° CSK TO MAJOR DIA
OF THD 3 HOLES
.062
.562
.625
7/8
.375
1/4 R
2 PLACES
.750
11/16
1 3/4
A
1/32 x 45° CHAMFER
1
.6248 +.0000 -.0002 DIA
⊥ Z .001
.281
17/32
⌒ .001
-Z-
SECTION A-A
2

120° CSK TO .375 DIA
TAP FOR 5/16-24 UNF-3B HELI-COIL.
USE HELI-COIL TAP #5FPB.
TOP COIL LOCATED 3/4 P-1 1/2 P
BELOW SURFACE.
REMOVE TANG AFTER INSERTION.

ITEM NO.	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	1	MS 21209-F5-15	HELI-COIL, SELF-LOCKING 5/16-24 UNF-3B
1	1	1899964-001	PLATE

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 **DATE** 23 Jan 1963

NEXT ASSY / USED ON — APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN FRIEDE DATE 3DEC62 CHECKED Baylen 14 DEC 62 APPROVAL J Hann 14 Dec '62 APPROVAL Whodel 14 DEC 62	MANNED SPACECRAFT CENTER HOUSTON, TEXAS PLATE - BACK UP RIGHT HAND REAR
	MATERIAL 1 J Sims 14 Dec 62 CONTRACT	NASA APPROVAL W J Rhine 1-23-63 MIT APPROVAL W Kupfer 23 Jan 63	CODE IDENT NO. SIZE D 1899964 SCALE FULL SHEET

1899964 C

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS A RELEASE TORR 01087		27-APR-63	A.J.F. / WC

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

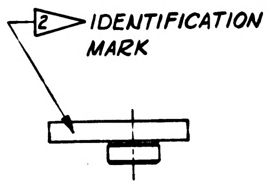
1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324 COND A.

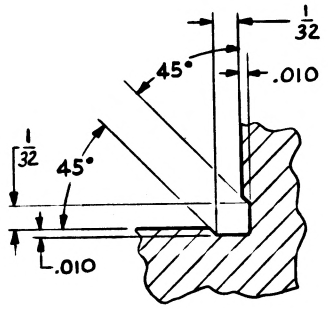
FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072 (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS NOT TO EXCEED 63√

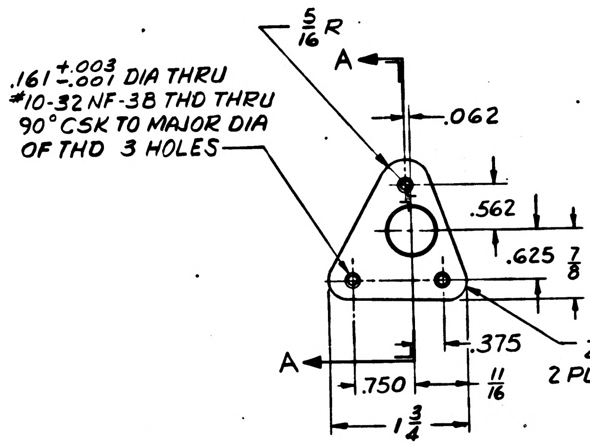
MUST BE FREE FROM BURRS.

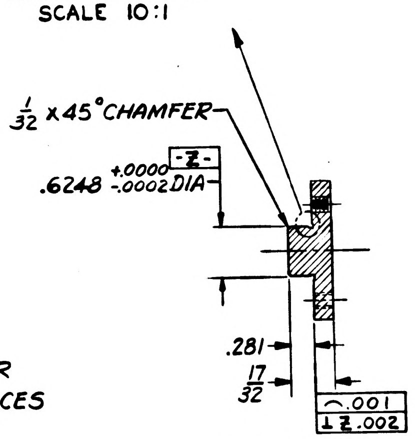
2 IDENTIFY USING PART NUMBER AND REVISION LETTER PER MIL-STD-130


2 IDENTIFICATION MARK


1/32
45°
.010
1/32
45°
.010

ENLARGED VIEW
SCALE 10:1


5/16 R
A
.161 +.003 -.001 DIA THRU
#10-32 NF-3B THD THRU
90° CSK TO MAJOR DIA
OF THD 3 HOLES
.062
.562
.625
7/8
.375
1/4 R
2 PLACES
A
.750
11/16
1 3/4


1/32 x 45° CHAMFER
.6248 +.0000 -.0002 DIA
-Z-
.281
17/32
⌒ .001
⊥ Z .002

SECTION A-A

00298

23 Jan 1963

1899966	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + 1/64 − 1/64 DECIMALS +.005 −.005 ANGLES +2° −2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN FRIEDE DATE 3 DEC 62 CHECKED 14 DEC 62 APPROVAL J. Hann 14 Dec '62 APPROVAL 14 DEC 62
NEXT ASSY	USED ON	MATERIAL 1 J. Smies 14 Dec 62	NASA APPROVAL 4-23-63 R Bro MIT APPROVAL 23 Jan 63
APPLICATION		CONTRACT NAS-9-497	

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE - BACK UP
RIGHT HAND REAR

CODE IDENT NO.
SIZE D
1899964
SCALE FULL
SHEET

PHOTOGRAPHIC SCALE ONLY
INCHES 0 1 2

B 1899965

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		UPGRADED FOR CLASS A RELEASE T DRRo1069		27-APR-63	A.J.F

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

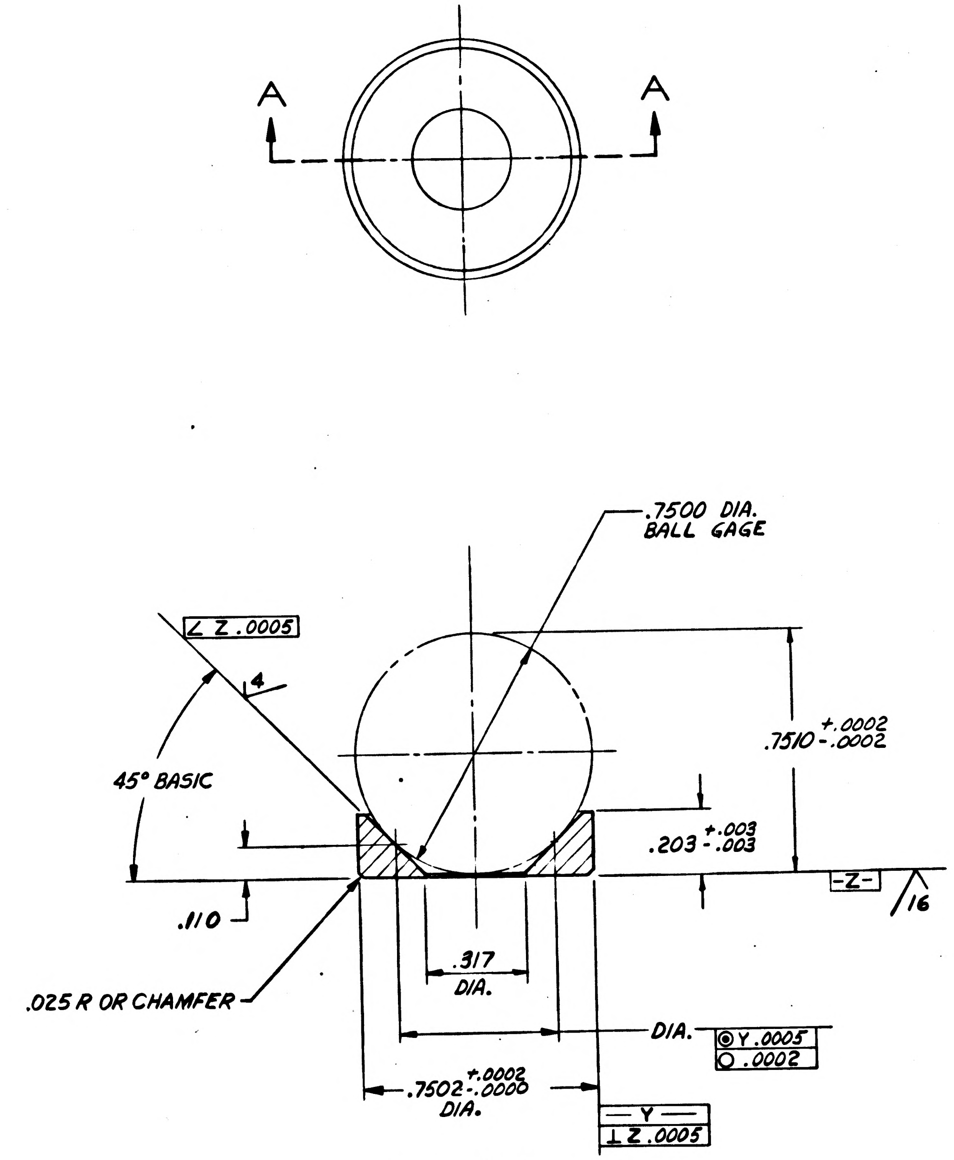
1 MATERIAL: STAINLESS STEEL PER QQ-S-763
CLASS 440 C, COND A.

HEAT TREAT PER MIL-H-6875, TO R_C 60 MINIMUM,
TEMPER FOR 1 HOUR AT 300°F

FINISH: MIL-F-14072 (SIG C) FINISH E-300

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO BE .005 TO .015 R OR CHAMFER

IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.


A
A
.7500 DIA.
BALL GAGE
∠ Z .0005
4
45° BASIC
.7510 +.0002 -.0002
.203 +.003 -.003
-Z-
16
.110
.317
DIA.
.025 R OR CHAMFER
DIA.
◎ Y .0005
○ .0002
.7502 +.0002 -.0000
DIA.
-Y-
⊥ Z .0005

SECTION A-A

00298
23 Jan 1963

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+
- 1/64	-.005	-

DO NOT SCALE THIS DRAWING
MATERIAL 1
18 Jan 63
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. SOMMER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 17 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 1-23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT - OPTICS MOUNTING

CODE IDENT NO.
SIZE D
1899965
SCALE 4:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10770-P

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

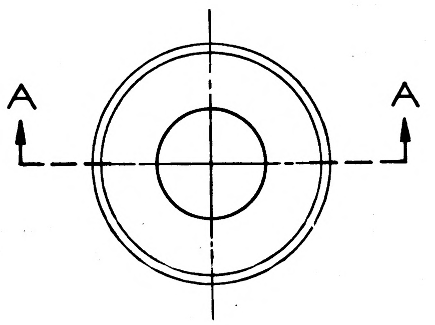
1▷ MATERIAL: STAINLESS STEEL PER QQ-S-763
CLASS 440 C, COND A.

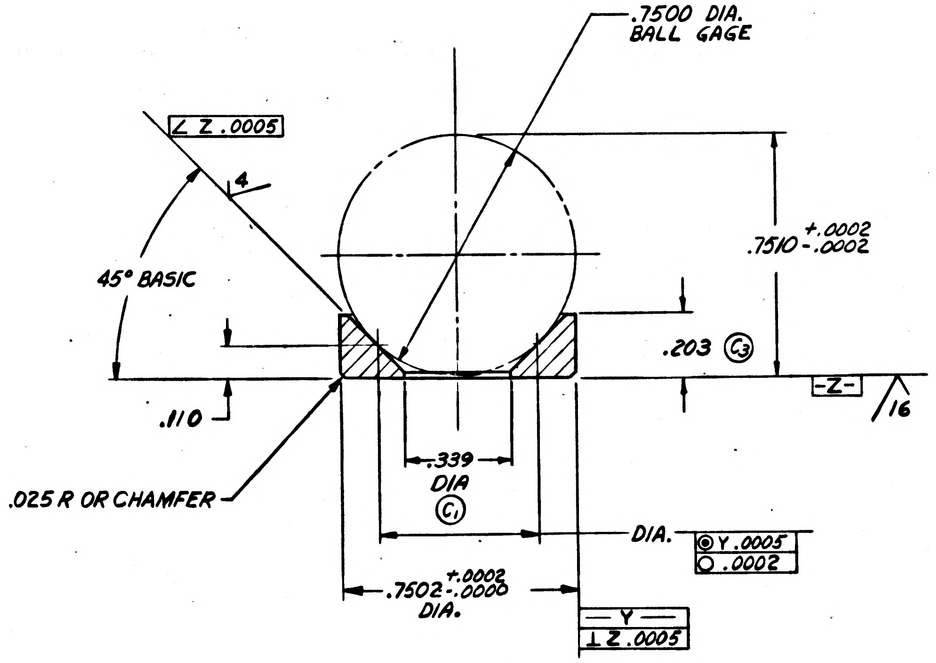
HEAT TREAT PER MIL-H-6875, TO R_c 60 MINIMUM,
TEMPER FOR 1 HOUR AT 300° F

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO BE .005 TO .015 R OR CHAMFER

IDENTIFY USING DRAWING NUMBER AND REVISION
LETTER PER MIL-STD-130.

(C2) FINISH: PASSIVATE IN ACCORDANCE WITH MIL-F-14072
(SIG C) FINISH E-300 PRIOR TO FINISH
MACHINING OF ✓ SURFACE.




.7500 DIA.
BALL GAGE
∠ Z .0005
4
45° BASIC
.7510 +.0002 -.0002
.203 (C3)
-Z-
16
.110
.025 R OR CHAMFER
.339 DIA (C1)
DIA.
◎ Y .0005
○ .0002
.7502 +.0002 -.0000 DIA.
— Y —
⊥ Z .0005

SECTION A-A

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		UPGRADED FOR CLASS A RELEASE TDRR 01088		27 APR 63	A.J.F. / WK
C3		REVISED IN ACCORDANCE WITH TDRR 01508		June 63	WK

00298
23 Jan 1963

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON	
FRACTIONS	+ 1/64 − 1/64
DECIMALS	+.005 −.005
ANGLES	+ −
DO NOT SCALE THIS DRAWING	
MATERIAL	1▷
CONTRACT	NAS9-497
NEXT ASSY	1899966
USED ON	1899950-011
APPLICATION	

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN
DRAWN L. SOMMER DATE 10 DEC 62
CHECKED J. Hayles 17 JAN 63
APPROVAL 17 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 1-23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INSERT - OPTICS
MOUNTING

CODE IDENT NO.
SIZE D
1899965
SCALE 4:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

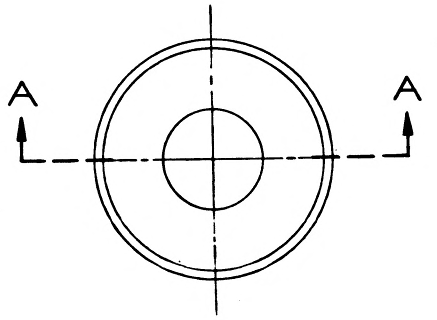
INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

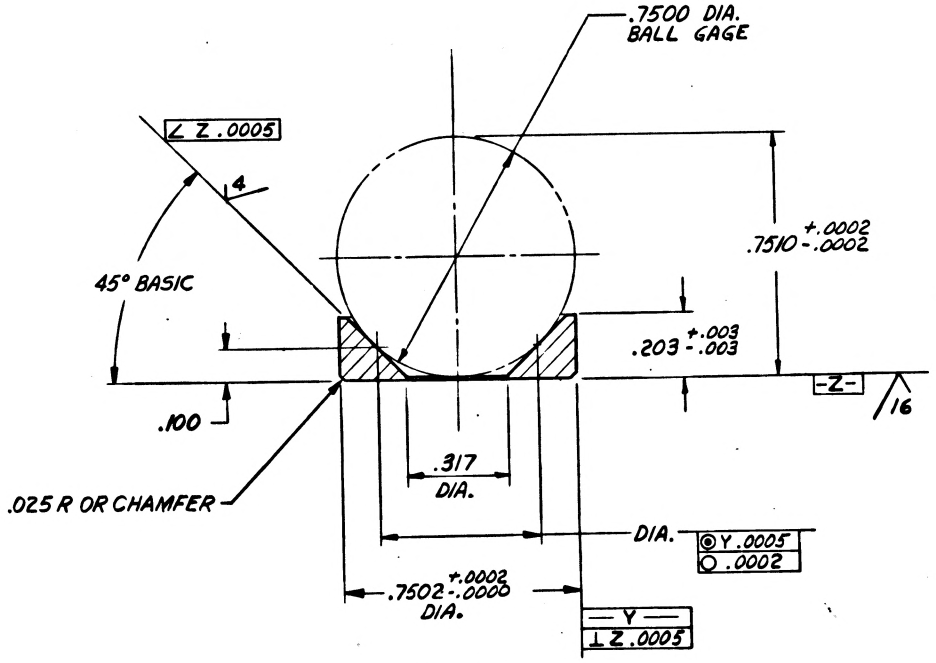
1 MATERIAL: STAINLESS STEEL PER QQ-S-763
CLASS 440 C, COND A.

HEAT TREAT PER MIL-H-6875, TO R_C 60 MINIMUM,
TEMPER FOR 1 HOUR AT 300° F

FINISH: MIL-F-14072 (SIG C) FINISH E-300

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO BE .005 TO .015 R OR CHAMFER





.7500 DIA.
BALL GAGE
∠ Z .0005
4
45° BASIC
.7510 +.0002 -.0002
.203 +.003 -.003
-Z-
16
.100
.317
DIA.
.025 R OR CHAMFER
DIA.
◎ Y .0005
○ .0002
.7502 +.0002 -.0000
DIA.
-Y-
⊥ Z .0005

SECTION A-A

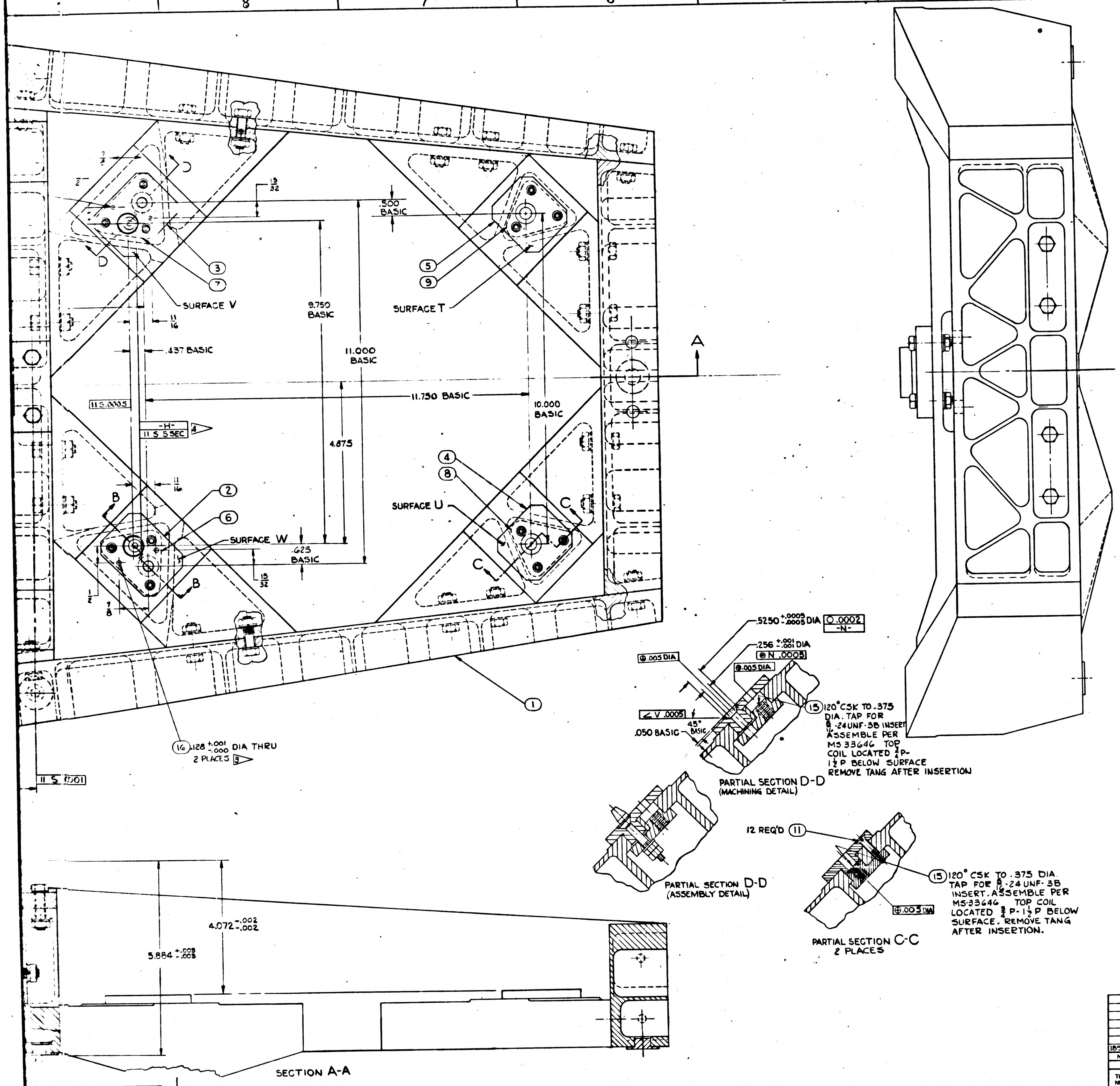
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 DATE 23 Jan 1963

NEXT ASSY / USED ON / APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $\pm\frac{1}{64}$ DECIMALS $\pm .005$ ANGLES ± DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	MATERIAL 1	DRAWN L. SOMMER DATE 10 DEC 62 CHECKED 17 JAN 63 APPROVAL 17 JAN 63 APPROVAL 18 JAN 63	INSERT - OPTICS MOUNTING	
	18 Jan 63 CONTRACT	NASA APPROVAL 1-23-63 MIT APPROVAL 23 Jan 63	CODE IDENT NO.	SIZE D 1899965
			SCALE 4:1	SHEET

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS

TDRR 01042 1MAY63



.500 BASIC
13/32
SURFACE V
SURFACE T
9.750 BASIC
11.000 BASIC
11/16
.437 BASIC
11.750 BASIC
10.000 BASIC
11 S .0005
-H-
11 S 5SEC
4
4.875
11/16
SURFACE U
SURFACE W
.625 BASIC
13/32
1/2
7/8
A
B
C
D
1
2
3
4
5
6
7
8
9
16 .128 +.001 -.000 DIA THRU 2 PLACES 3
11 S .0001
.5250 +.0005 -.0005 DIA ○ .0002 -N-
.256 +.001 -.001 DIA
⊕ .005 DIA
◎ N .0005
⊕ .005 DIA
∠ V .0005
45° BASIC
.050 BASIC
12 REQ'D 11
⊕ .005 DIA
4.072 +.002 -.002
5.884 +.003 -.003

15 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE REMOVE TANG AFTER INSERTION

PARTIAL SECTION D-D
(MACHINING DETAIL)

PARTIAL SECTION D-D
(ASSEMBLY DETAIL)

15 120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION.

PARTIAL SECTION C-C
2 PLACES

SECTION A-A

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
16	4	MS-171524-101	PIN-SPRING
15	4	MS-21209-FS-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284-312	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ ↓ ↓ L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ ↓ ↓ L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

1899966

00456 27Feb63

1899950-011	1899950-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO.
SIZE J
1899966
SCALE 1:1
SHEET

1899966

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1 INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

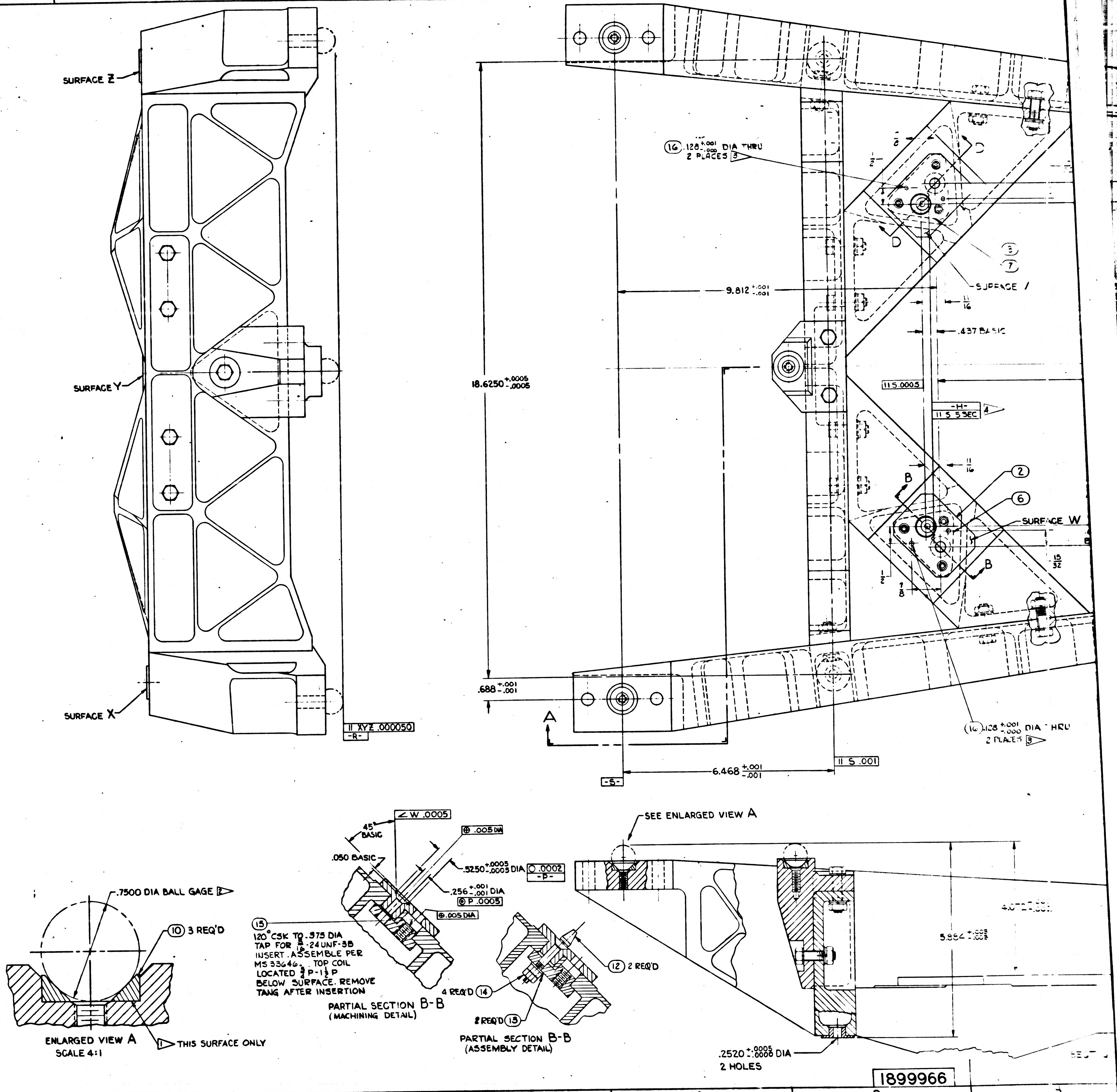
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68°±1°F.

2 THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

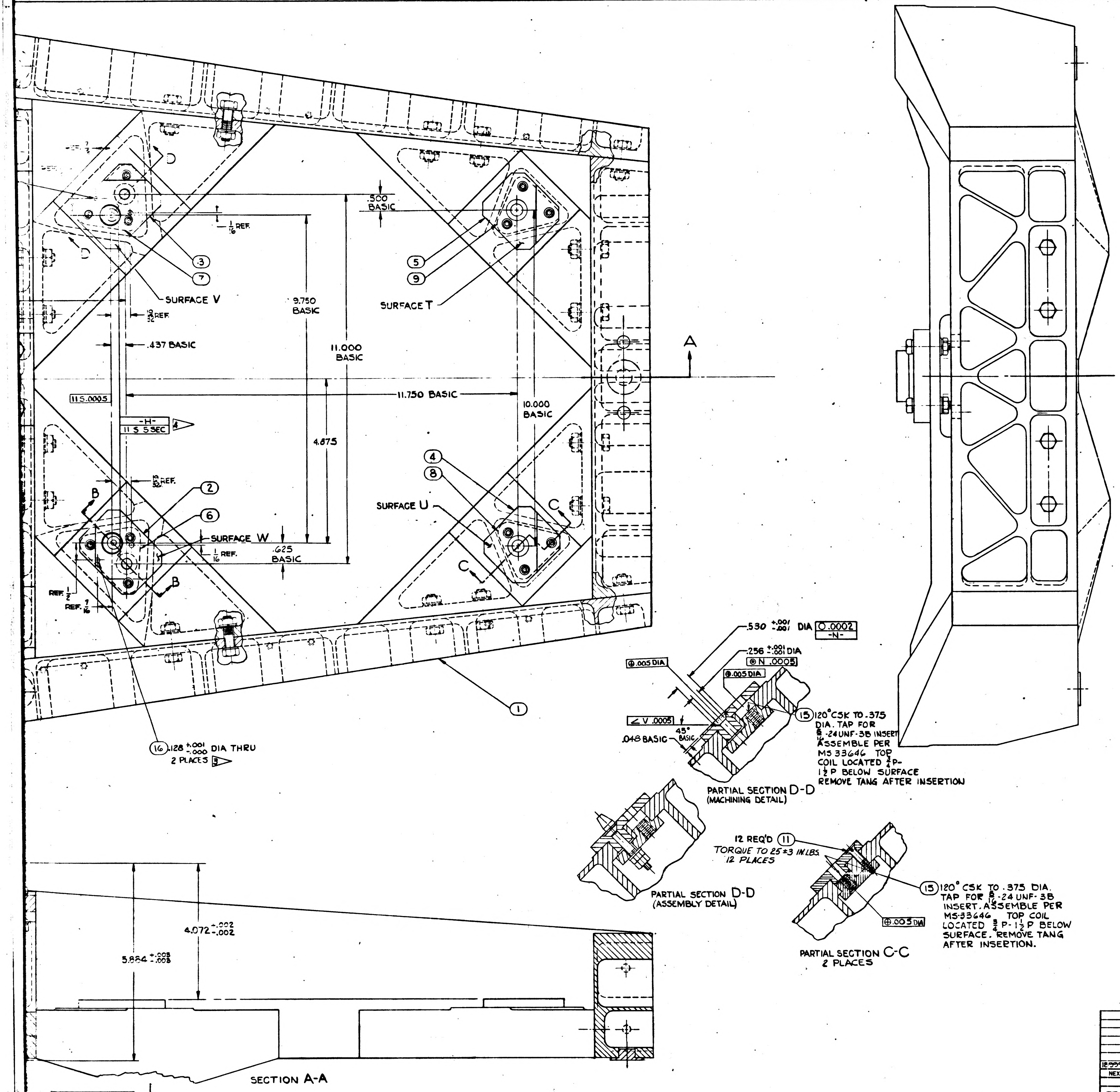
4 APPLY LOCKTITE MIL-S-40083 (ORD) CLASS 30 TO JAM NUTS AFTER ADJUSTMENT OF DATUM -H- TO -S-.

3 INSERT PINS $\frac{1}{16}$ BELOW SURFACES "V" & "W PRIOR TO FINISH MACHINING OF THESE SURFACES.

SURFACES T, U, V & W AND OPTICS MOUNTING INSERTS (ITEM 10) TO BE PROTECTED AT ALL TIMES AFTER FINAL MACHINING


SURFACE Z
SURFACE Y
SURFACE X
II XYZ .000050
-R-
16 .128 +.001 -.000 DIA THRU 2 PLACES 3
D
3
7
SURFACE /
9.812 +.001 -.001
11/16
.437 BASIC
18.6250 +.0005 -.0005
II S .0005
-H-
II S 5 SEC
4
2
6
SURFACE W
B
15/32
1/2
7/8
.688 +.001 -.001
A
6.468 +.001 -.001
II S .001
-S-
16 .128 +.001 -.000 DIA THRU 2 PLACES 3
SEE ENLARGED VIEW A
5.854 +.005 -.005
.2520 +.0005 -.0000 DIA
2 HOLES
.7500 DIA BALL GAGE 2
10 3 REQ'D
1 THIS SURFACE ONLY
ENLARGED VIEW A
SCALE 4:1
∠ W .0005
45° BASIC
.050 BASIC
⊕ .005 DIA
.5250 +.0005 -.0005 DIA
○ .0002
-P-
.256 +.001 -.001 DIA
◎ P .0005
⊕ .005 DIA
15
120° CSK TO .375 DIA
TAP FOR 5/16-24UNF-3B
INSERT. ASSEMBLE PER
MS 33646. TOP COIL
LOCATED 3/4 P-1 1/2 P
BELOW SURFACE. REMOVE
TANG AFTER INSERTION
PARTIAL SECTION B-B
(MACHINING DETAIL)
12 2 REQ'D
4 REQ'D 14
2 REQ'D 13
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)
1899966

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS
		TDRR 01092			
E		REVISED IN ACCORDANCE WITH TDRR 01596			
F		REVISED IN ACCORDANCE WITH TDRR 01836			23 Jul 63
		REVISED IN ACCORDANCE WITH TDRR			
		REVISED IN ACCORDANCE WITH TDRR			



8
7
6
5
4
3
2
D
D
3
7
5
9
.500 BASIC
$\frac{1}{16}$ REF.
SURFACE V
9.750 BASIC
11.000 BASIC
SURFACE T
$\frac{3}{32}$ REF.
.437 BASIC
A
11.750 BASIC
10.000 BASIC
115.0005
-H-
11 S 5SEC
4.875
$\frac{13}{32}$ REF.
2
6
B
4
8
SURFACE U
C
SURFACE W
$\frac{1}{16}$ REF.
.625 BASIC
C
B
REF. $\frac{1}{2}$
REF. $\frac{7}{16}$
1
16 .128 +.001 -.000 DIA THRU 2 PLACES
.530 +.001 -.001 DIA ○ .0002 -N-
.256 +.001 -.001 DIA ◎ N .0005
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
15 120° CSK TO .375 DIA. TAP FOR $\frac{5}{16}$-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED $\frac{3}{4}$P-1$\frac{1}{2}$P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D 11 TORQUE TO 25±3 IN.LBS. 12 PLACES
15 120° CSK TO .375 DIA. TAP FOR $\frac{5}{16}$-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED $\frac{3}{4}$P-1$\frac{1}{2}$P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 +.002 -.002
5.884 +.003 -.003
SECTION A-A

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171524-101	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284-312	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ L H REAR
7	1	1899962	↓ R H FRONT
6	1	1899961	↓ L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ L H REAR
3	1	1899958	↓ R H FRONT
2	1	1899957	↓ L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

00456 27 Feb 63

1899950-011	1899950-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 17 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 2-27-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

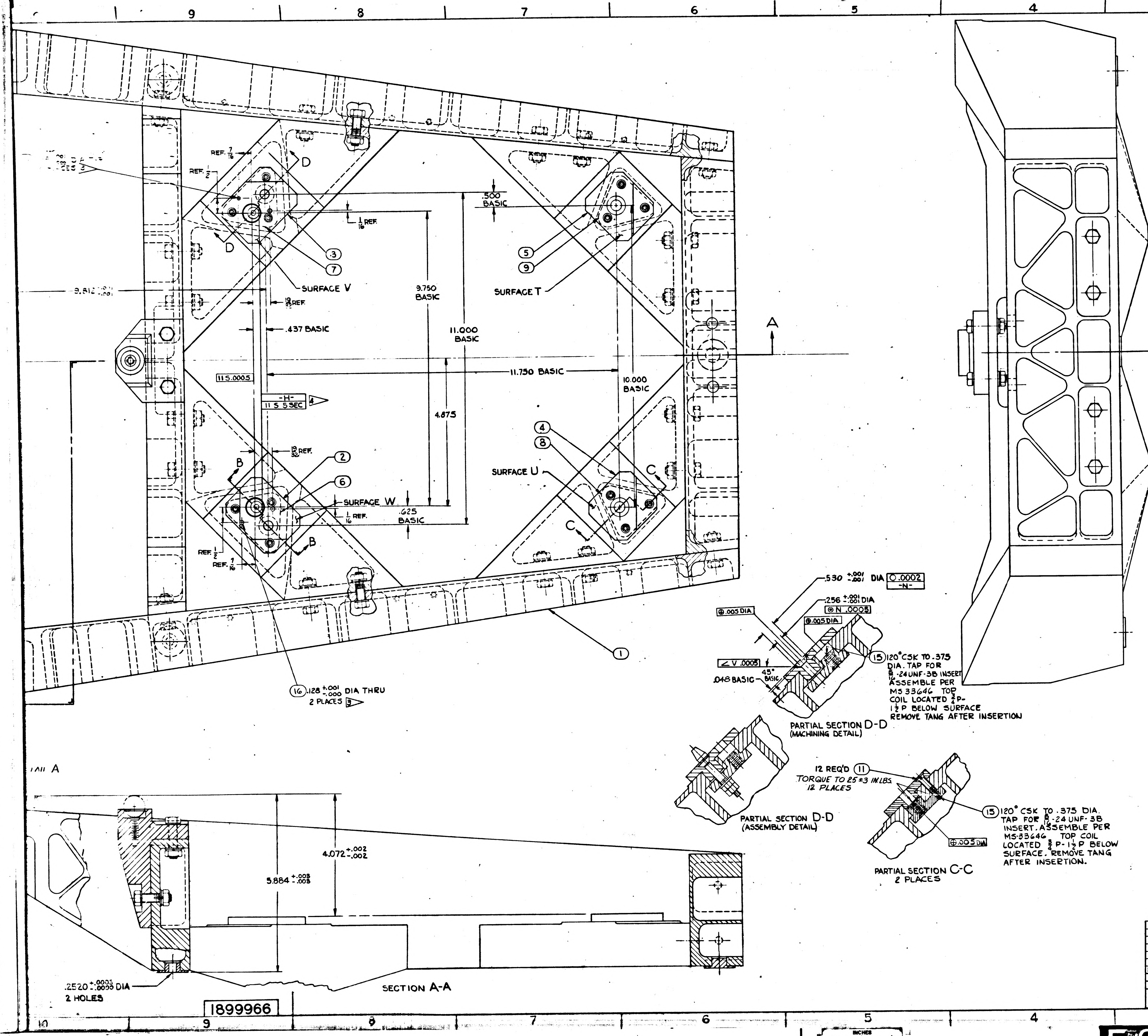
CODE IDENT NO.
SIZE J
1899966
SCALE 1:1
SHEET

1899966

INCHES
PHOTOGRAPHIC SCALE ONLY

F-3

SYM	ZONE	REVISIONS DESCRIPTION	CHG
D		UPDATED FOR CLASS A RELEASE	
E		REVISED IN ACCORDANCE WITH TDRR [illegible]	
F		REVISED IN ACCORDANCE WITH TDRR [illegible]	
		REVISED IN ACCORDANCE WITH TDRR	
		REVISED IN ACCORDANCE WITH TDRR	



9
8
7
6
5
4
3
2
REF. 7/16
REF. 1/2
D
D
3
7
1/16 REF.
.500 BASIC
5
9
9.812
SURFACE V
9.750 BASIC
SURFACE T
3/8 REF.
.437 BASIC
11.000 BASIC
A
11.750 BASIC
10.000 BASIC
11 S .0005
-H-
11 S .5 SEC
4
4.875
4
8
19/32 REF.
2
6
B
SURFACE U
C
SURFACE W
1/16 REF.
.625 BASIC
C
B
REF. 1/2
REF. 7/16
1
16 .128 +.001 -.000 DIA THRU
2 PLACES 3
.530 +.001 -.001 DIA ○ .0002 -N-
.256 +.001 -.001 DIA
◎ N .0005
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
15 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D 11
TORQUE TO 25 ±3 IN.LBS. 12 PLACES
⊕ .005 DIA
15 120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
PARTIAL SECTION C-C 2 PLACES
A
4.072 +.002 -.002
5.884 +.003 -.003
.2520 +.0005 -.0000 DIA
2 HOLES
SECTION A-A
10

1899966

DRAWING INCOMPLETE-

ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HAR

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKIN
17	2	MS-21209-F4-15	INSERT-SELF LOCKIN
16	4	MS-171524-101	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF L
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284-312	SCREW-FLAT HD,
10	3	1899965	INSERT-OPTICS
9	1	1899964	PLATE-BACK-UP,
8	1	1899963	↓
7	1	1899962	↓
6	1	1899961	↓
5	1	1899960	PAD-IMU MOUNT
4	1	1899959	↓
3	1	1899958	↓
2	1	1899957	↓
1	1	1899955	STRUCTURAL ASSY.-

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1899950-011	1899950-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING

MATERIAL
—

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 6 DEC 62
CHECKED [illegible] 17 JAN 63
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 2-27-63
MIT APPROVAL [illegible]

MANN
SPACECRAFT
HOUSTON,

FRAME ASSE
NAVIGATION
(FINAL MAC

CODE IDENT NO.
SIZE
189
SCALE

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1 INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

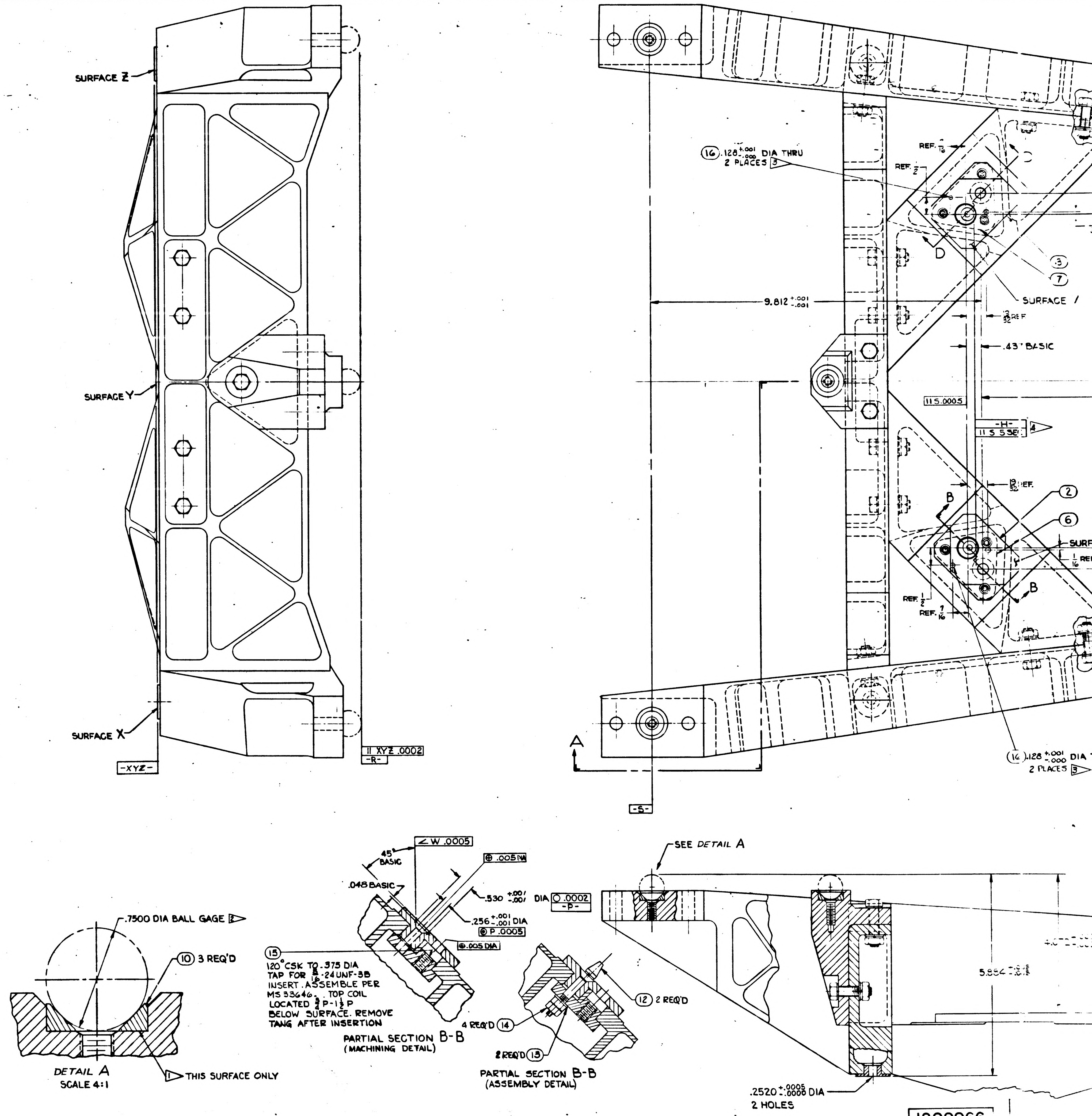
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68°±1°F.

2 THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

3 INSERT PINS 1/16 BELOW SURFACES "V" & "W PRIOR TO FINISH MACHINING OF THESE SURFACES.

SURFACES T, U, V & W AND OPTICS MOUNTING INSERTS (ITEM 10) TO BE PROTECTED AT ALL TIMES AFTER FINAL MACHINING

4 *AFTER ADJUSTMENT OF DATUM -H- TO -S-*
TORQE 1 EACH, ITEM 14, (2 PLACES) TO 85 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.
APPLY COMPOUND, MIL-S-40083 (ORD) CLASS 30, TO THDS. OF ITEM 12 (2 PLACES).
TORQE, 1 EACH, ITEM 14, (2 PLACES TO 60 ± 5 IN LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.

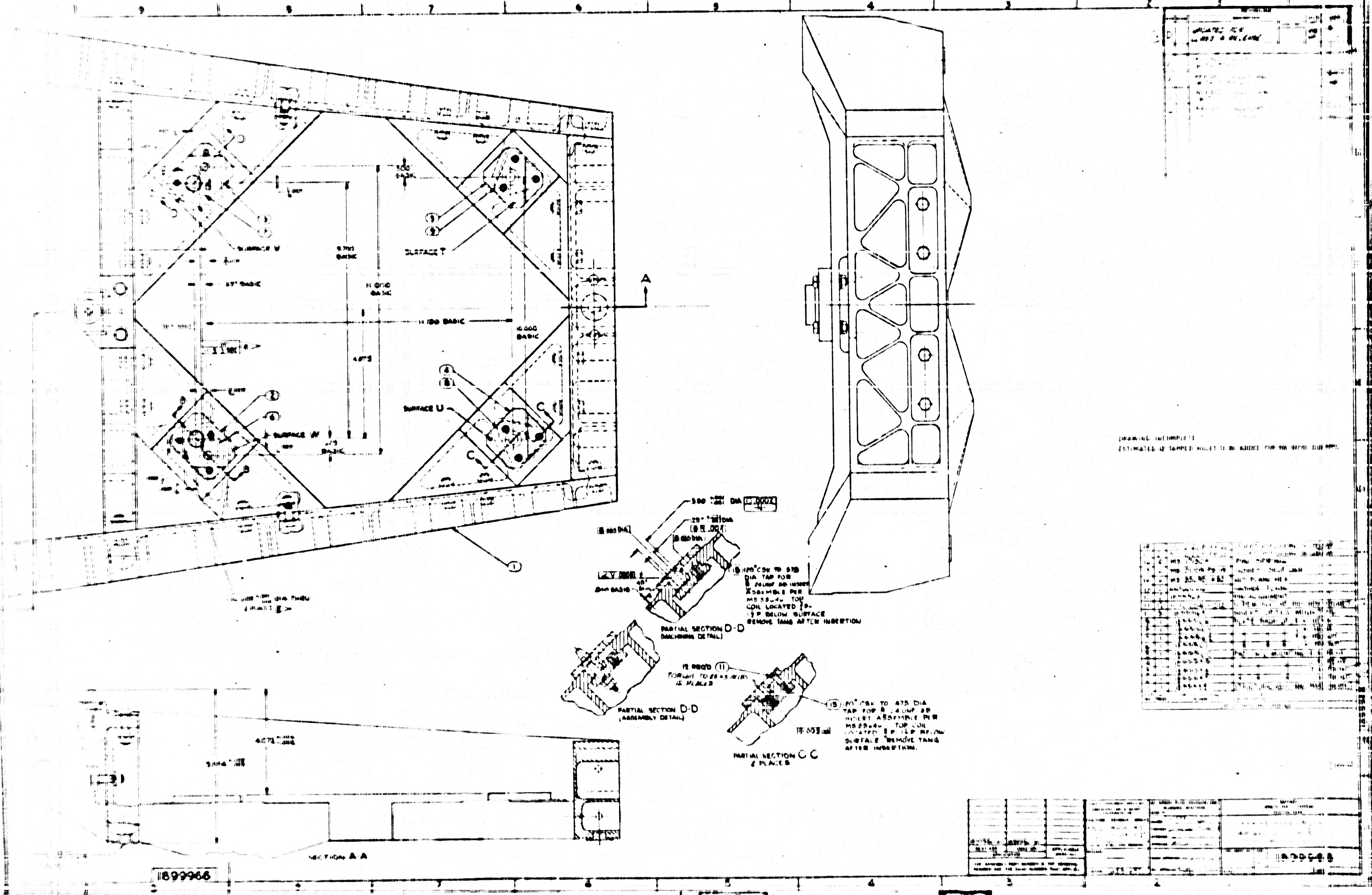

SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
∥ XYZ .0002
-R-
16 .128 +.001 −.000 DIA THRU 2 PLACES 3
REF. 1/16
REF. 1/2
D
3
7
SURFACE
9.812 +.001 −.001
13/32 REF
.43 BASIC
⊥ S .0005
-H-
∥ S .0005
4
19/32 REF.
B
2
6
SURF
1/16 REF
REF. 1/2
REF. 7/16
16 .128 +.001 −.000 DIA
2 PLACES 3
A
-S-
SEE DETAIL A
.7500 DIA BALL GAGE 2
10 3 REQ'D
1 THIS SURFACE ONLY
∠ W .0005
45° BASIC
.048 BASIC
⊕ .005 DIA
.530 +.001 −.001 DIA ○ .0002
-P-
.256 +.001 −.001 DIA
◎ P .0005
⊕ .005 DIA
15
120° CSK TO .375 DIA
TAP FOR 5/16-24 UNF-3B
INSERT. ASSEMBLE PER
MS 33646. TOP COIL
LOCATED 3/4 P-1 1/2 P
BELOW SURFACE. REMOVE
TANG AFTER INSERTION
12 2 REQ'D
4 REQ'D 14
2 REQ'D 13
5.554
.2520 +.0005 −.0000 DIA
2 HOLES

DETAIL A
SCALE 4:1

PARTIAL SECTION B-B
(MACHINING DETAIL)

PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

1899966

SURFACE V
SURFACE T
SURFACE U
SURFACE W
.500 BASIC
9.750 BASIC
11.000 BASIC
11.750 BASIC
10.000 BASIC
4.875 BASIC
.375 BASIC
A
C
.390 DIA
.0002
-N-
.281 DIA
.004
.188 DIA
.060 BASIC
45°
(15) 120° CSK TO .578 DIA TAP FOR INSERT ASSEMBLE PER MS 33540 TOP COIL LOCATED BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D (11)
TORQUE TO IN-LBS 4 PLACES
(15) 120° CSK TO .475 DIA TAP FOR INSERT ASSEMBLE PER MS 33540 TOP COIL LOCATED BELOW SURFACE. REMOVE TANG AFTER INSERTION.
PARTIAL SECTION C-C 2 PLACES
SECTION A-A
4.075
11899966
1
2
4
6
8
9

E-2

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED

MUST BE FREE FROM BURRS.
SURFACES [illegible] MUST BE FLAT WITHIN .0001
SURFACE [illegible] MUST BE PARALLEL WITH SURFACE
[illegible] WITHIN .0002
[illegible] MAY BE MACHINED OR LAPPED TO OBTAIN
THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

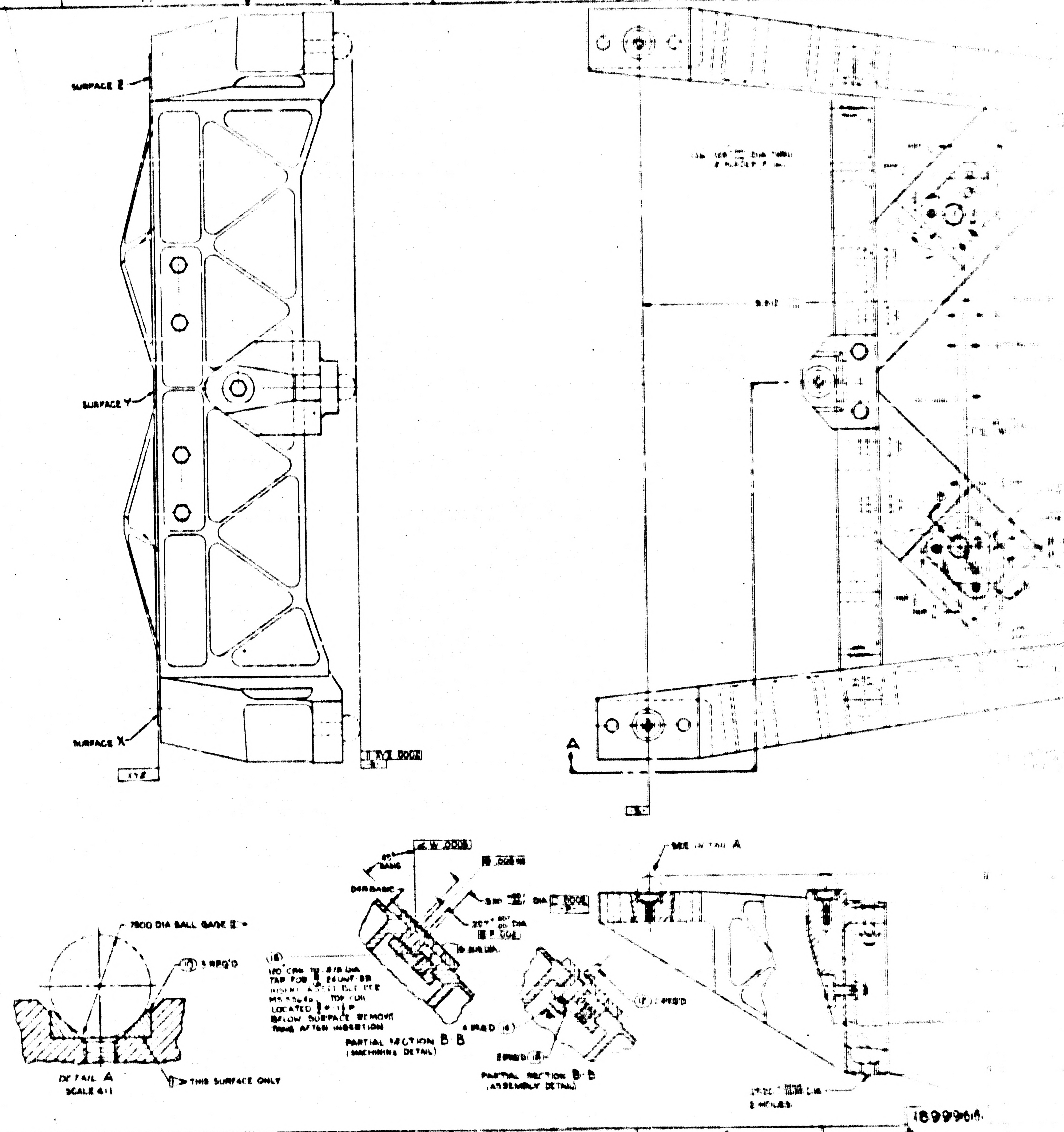
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A
UNIFORM PART TEMPERATURE OF 68°±1°F.

THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE
WITHIN [illegible] TOLERANCE ZONE.

INSERT PINS BELOW SURFACES V & W PRIOR
TO FINISH MACHINING OF THESE SURFACES.

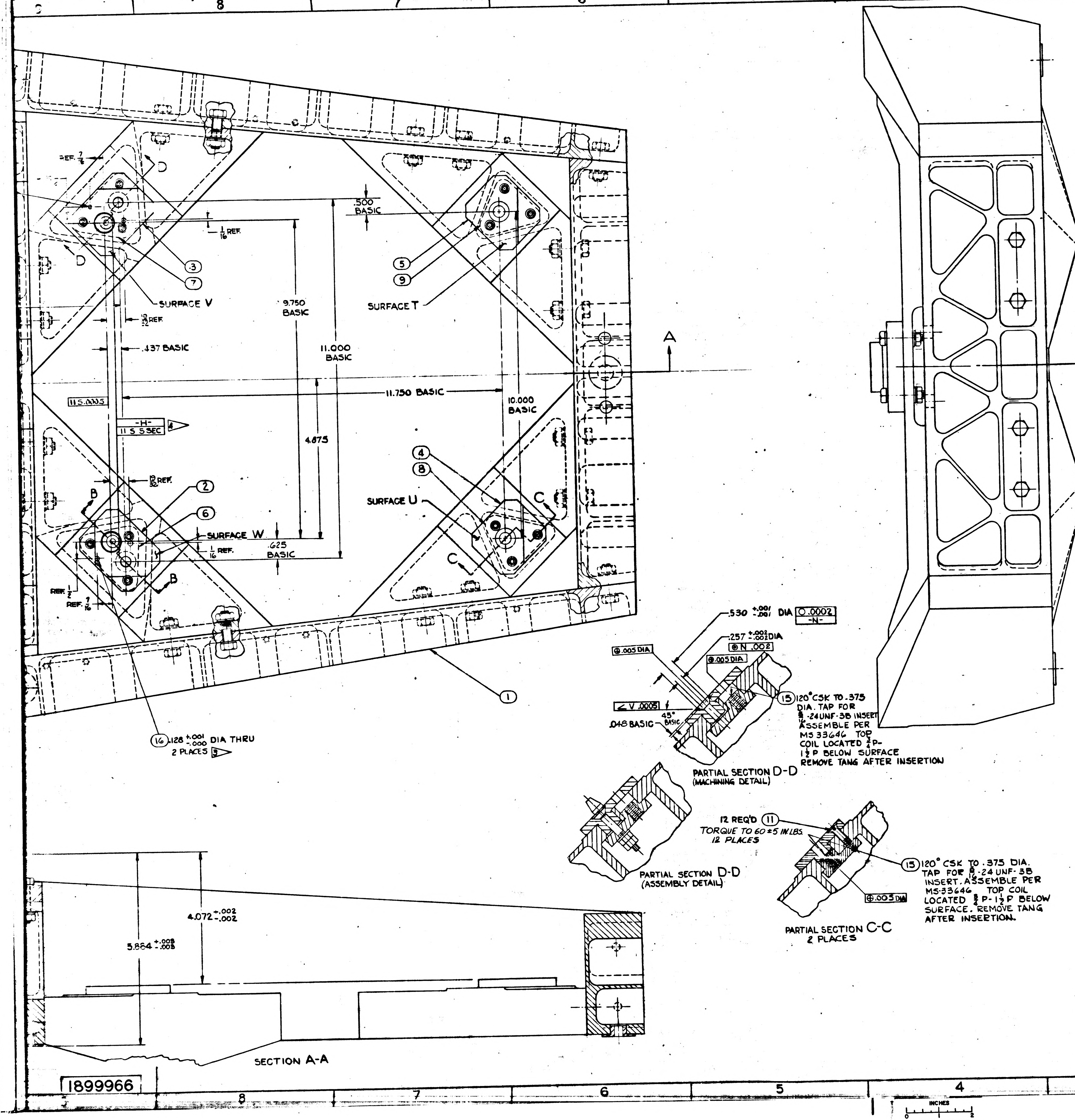
SURFACES T U V & W AND OPTICS MOUNTING INSERTS
SHALL BE PROTECTED AT ALL TIMES AFTER FINAL
MACHINING.

[illegible]


SURFACE Z
SURFACE Y
SURFACE X
A
SEE DETAIL A
.7500 DIA BALL GAGE
(10) 3 REQ'D
DETAIL A
SCALE 4:1
THIS SURFACE ONLY
(18)
120° CRN TO .878 DIA
TAP FOR 1/4-24UNF-3B
INSERT ASSEMBLY PER
MS 9564 TOP COIL
LOCATED BELOW SURFACE REMOVE
TANG AFTER INSERTION
45° BASIC
.048 BASIC
W .0005
4 REQ'D (14)
PARTIAL SECTION B-B
(MACHINING DETAIL)
(17) 2 REQ'D
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)
3 HOLES
1899964

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS
		TDRR 01092		1 MAY 63	
E		REVISED IN ACCORDANCE WITH TDRR 01596			
F		REVISED IN ACCORDANCE WITH TDRR 01836			23 JUL 63
G		REVISED IN ACCORDANCE WITH TDRR 01969			
H		REVISED IN ACCORDANCE WITH TDRR 01970			3
J		REVISED IN ACCORDANCE WITH TDRR 02310		6 AUG 63	

REVISIONS



8
7
6
5
4
3
2
1
REF. 7/16
.500 BASIC
1/16 REF.
3
7
5
9
SURFACE V
SURFACE T
9.750 BASIC
11.000 BASIC
13/32 REF.
.437 BASIC
A
11.750 BASIC
10.000 BASIC
-H-
4.875
13/32 REF.
2
6
4
8
SURFACE U
SURFACE W
1/16 REF.
.625 BASIC
B
C
REF. 1/2
REF. 7/16
1
16 .128 +.001 -.000 DIA THRU 2 PLACES
.530 +.001 -.001 DIA ○ .0002 -N-
.257 +.002 -.002 DIA
⊕ .005 DIA
◎ N .002
∠ V .0005
45° BASIC
.048 BASIC
15 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
12 REQ'D 11 TORQUE TO 60 ± 5 IN.LBS. 12 PLACES
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
15 120° CSK TO .375 DIA. TAP FOR 3/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 +.002 -.002
5.864 +.005 -.005
SECTION A-A

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284-312	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

00456 27Feb63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1899950-011	1899950-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 11 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 2-27-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

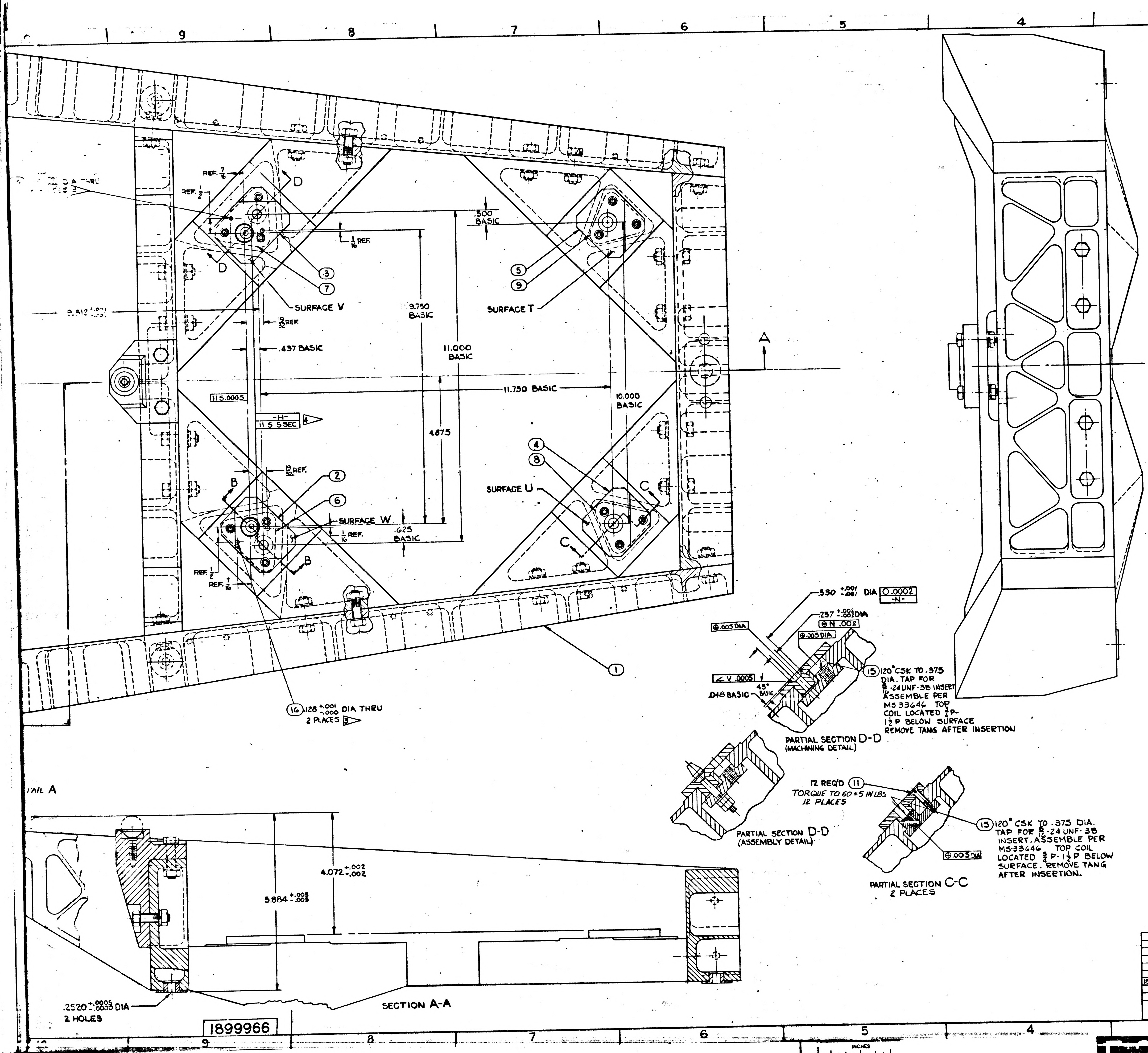
FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO
SIZE J
1899966
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F-3

		REVISIONS		
SYM	ZONE	DESCRIPTION	CHG NO	DATE
D		UPDATED FOR CLASS A RELEASE		27 APR 63
E		REVISED IN ACCORDANCE WITH TDRR 0 536		
F		REVISED IN ACCORDANCE WITH TDRR 0 836		
G		REVISED IN ACCORDANCE WITH TDRR 0 53		
H		REVISED IN ACCORDANCE WITH TDRR 0 87		
J		REVISED IN ACCORDANCE WITH TDRR 023 0		


9
8
7
6
5
4
3
2
.128 DIA THRU 2 PLACES 3
REF. 7/16
REF. 1/2
D
.500 BASIC
1/16 REF.
3
7
5
9
SURFACE V
SURFACE T
9.812 ±.001
13/32 REF.
9.750 BASIC
11.000 BASIC
.437 BASIC
A
11.750 BASIC
10.000 BASIC
115.0005
-H- 11 S SSEC 4
4.875
4
8
13/32 REF.
2
6
SURFACE U
SURFACE W
1/16 REF.
.625 BASIC
B
C
REF. 1/2
REF. 7/16
1
16 .128 +.001 -.000 DIA THRU 2 PLACES 3
.530 +.001 -.001 DIA 0.0002 -N-
.257 +.002 -.002 DIA
⊕ N .002
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
15 120° CSK TO .375 DIA. TAP FOR 1/4-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
12 REQ'D 11
TORQUE TO 60 ± 5 IN.LBS. 12 PLACES
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
15 120° CSK TO .375 DIA. TAP FOR 1/4-24 UNF-3B INSERT. ASSEMBLE PER MS33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
TAIL A
4.072 +.002 -.002
5.884 +.003 -.003
.2520 +.0005 -.0000 DIA 2 HOLES
SECTION A-A
1899966
9
8
7
6
5
4

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CL

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28
16	4	MS-171528	PIN SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284-312	SCREW-FLAT HD, 100° HEX
10	3	1899965	INSERT-OPTICS MOUNT
9	1	1899964	PLATE-BACK-UP, R H R
8	1	1899963	↓ ↓ ↓ L H R
7	1	1899962	R H F
6	1	1899961	L H F
5	1	1899960	PAD- M U MOUNTING, R
4	1	1899959	↓ ↓ ↓ L
3	1	1899958	R
2	1	1899957	L
1	1	1899955	STRUCTURAL ASSY.-NAV. BA
LIST OF PARTS AND MATERIALS			

00456

1899950-011	1899950-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 6 DEC 62
CHECKED 17 JAN 63
APPROVAL 17 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 2-27-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY
NAVIGATION BASE
(FINAL MACHINING)

CODE IEDNT NO
SIZE -
1899
SCALE 1:1

3
2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16√

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1 ▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

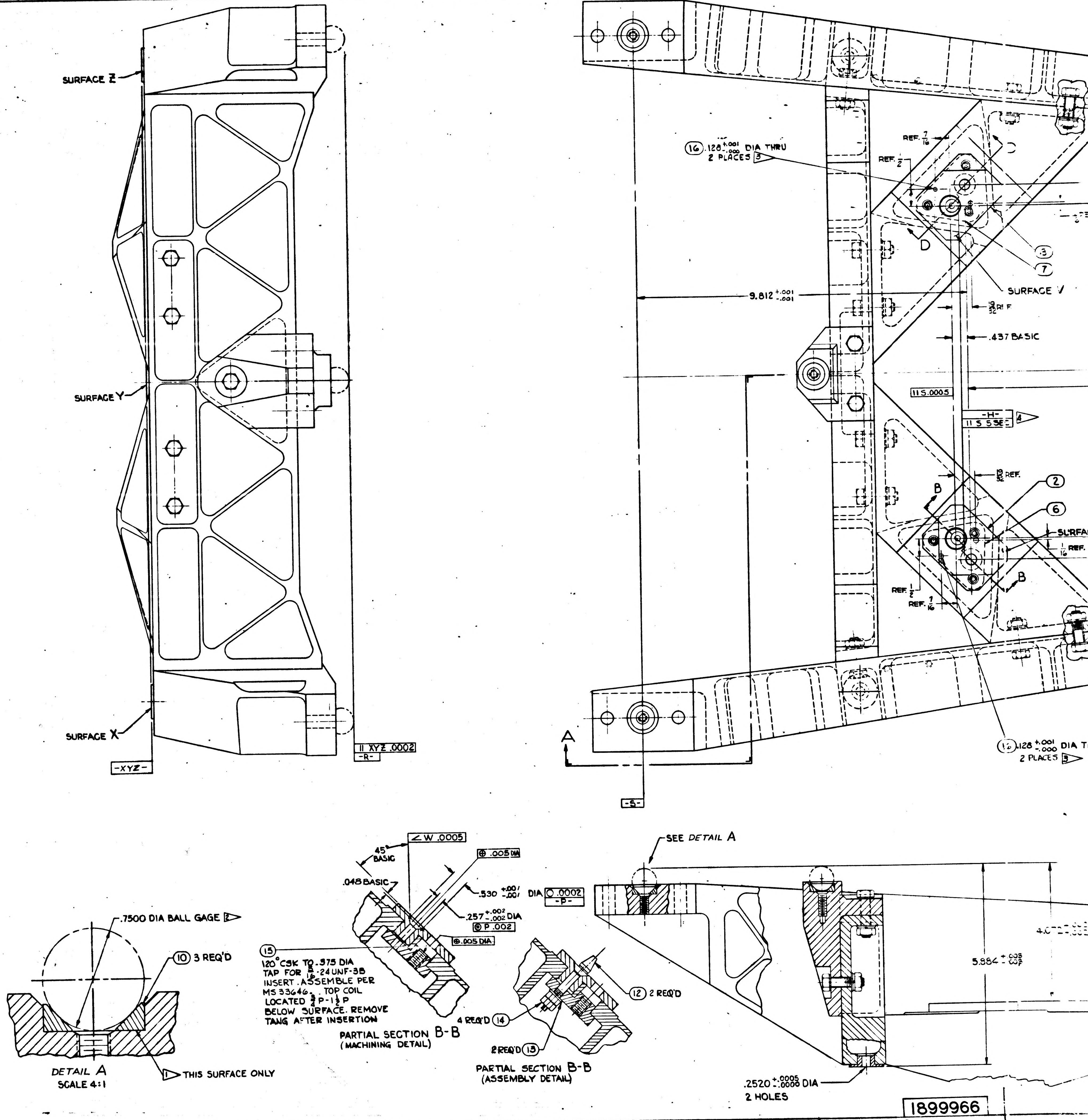
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68°±1°F.

2 ▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

3 ▷ INSERT PINS $\frac{1}{16}$ BELOW SURFACES "V" & "W PRIOR TO FINISH MACHINING OF THESE SURFACES.

SURFACES T, U, V & W AND OPTICS MOUNTING INSERTS (ITEM 10) TO BE PROTECTED AT ALL TIMES AFTER FINAL MACHINING

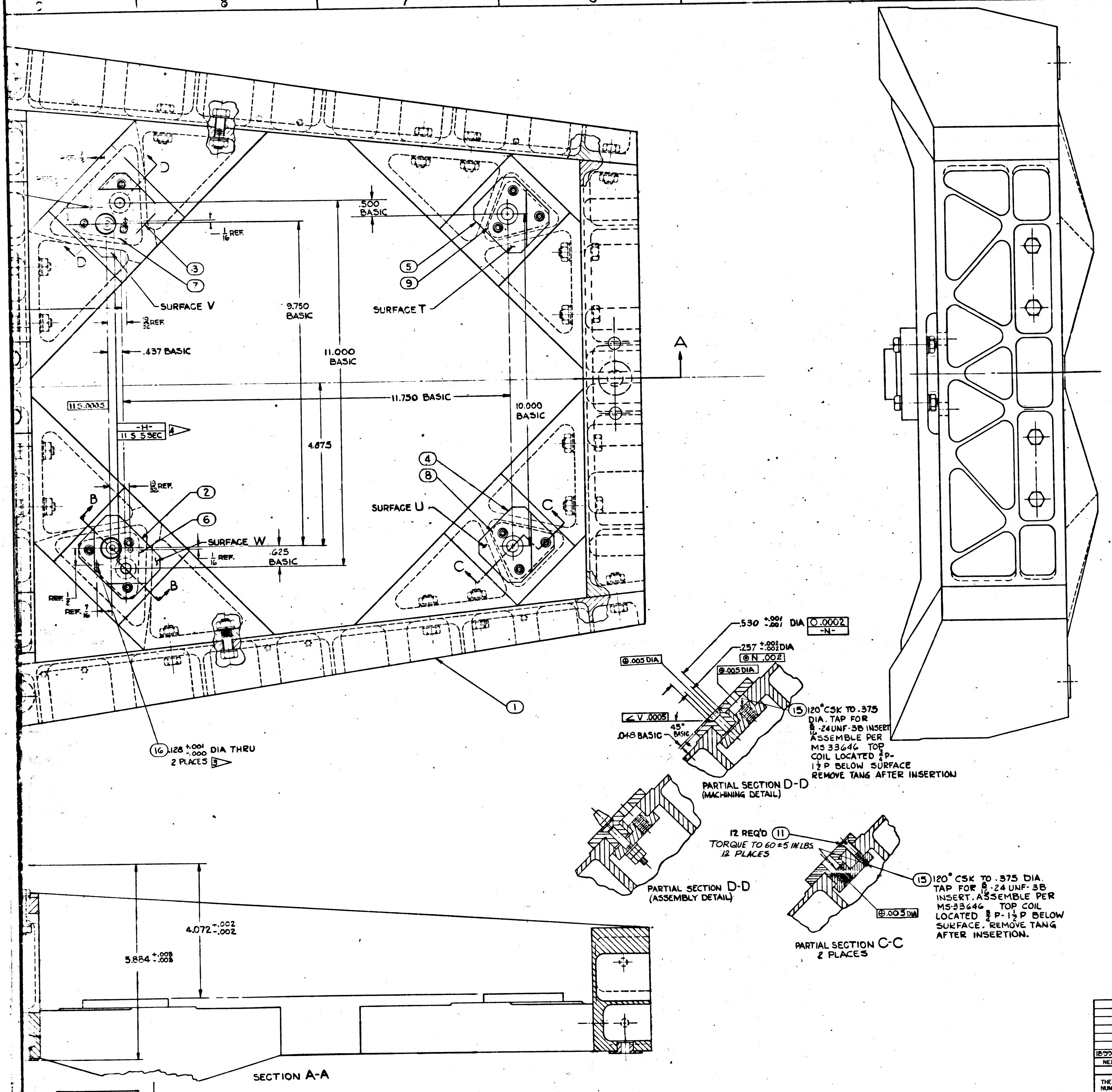
4 ▷ *AFTER ADJUSTMENT OF DATUM -H- TO -S-*
TORQE 1 EACH, ITEM 14, (2 PLACES) TO 85 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.
APPLY COMPOUND, MIL-S-40083 (ORD) CLASS 30, TO THDS. OF ITEM 12 (2 PLACES).
TORQE, 1 EACH, ITEM 14, (2 PLACES TO 60 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.


SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
∥ XYZ .0002
-R-
⑯ .128 +.001 −.000 DIA THRU
2 PLACES 3
REF. 7/16
REF. 1/2
D
③
⑦
SURFACE V
9.812 +.001 −.001
19/32 REF
.437 BASIC
∥ S .0005
-H-
∥ S 5 SEC
4
19/32 REF.
B
②
⑥
SURFACE
1/16 REF.
REF. 1/2
REF. 7/16
⑯ .128 +.001 −.000 DIA THRU
2 PLACES 3
A
-S-
SEE DETAIL A
5.884 +.005 −.005
.2520 +.0005 −.0000 DIA
2 HOLES
.7500 DIA BALL GAGE 2
⑩ 3 REQ'D
DETAIL A
SCALE 4:1
1 THIS SURFACE ONLY
∠ W .0005
45° BASIC
⊕ .005 DIA
.048 BASIC
.530 +.001 −.001 DIA
○ .0002
-P-
.257 +.002 −.002 DIA
◎ P .002
⊕ .005 DIA
⑮
120° CSK TO .375 DIA
TAP FOR 5/16-24 UNF-3B
INSERT. ASSEMBLE PER
MS 33646. TOP COIL
LOCATED 3/4 P-1 1/2 P
BELOW SURFACE. REMOVE
TANG AFTER INSERTION
PARTIAL SECTION B-B
(MACHINING DETAIL)
⑫ 2 REQ'D
4 REQ'D ⑭
2 REQ'D ⑬
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

1899966

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS
		TDRR 01092			
E		REVISED IN ACCORDANCE WITH TDRR 01596			
F		REVISED IN ACCORDANCE WITH TDRR 01836			23 63
G		REVISED IN ACCORDANCE WITH TDRR 01969			
H		REVISED IN ACCORDANCE WITH TDRR 01970			3
J		REVISED IN ACCORDANCE WITH TDRR 02310		6 AUG 63	RWG
K		REVISED IN ACCORDANCE WITH TDRR 02404		12 AUG 63	RWG



SURFACE V
SURFACE T
SURFACE U
SURFACE W
.500 BASIC
9.750 BASIC
11.000 BASIC
11.750 BASIC
10.000 BASIC
4.875
.437 BASIC
.625 BASIC
1/16 REF.
3/32 REF.
13/32 REF.
REF. 1/2
REF. 7/16
-H-
11 S .0005
11 S 5SEC
A
B
C
D
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑯ .128 +.001 -.000 DIA THRU 2 PLACES 3
.530 +.001 -.001 DIA 0.0002 -N-
.257 +.002 -.002 DIA
⊕ N .002
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
⑮ 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D ⑪
TORQUE TO 60 ± 5 IN.LBS. 12 PLACES
⑮ 120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 +.002 -.002
5.884 +.003 -.003
SECTION A-A

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ ↓ ↓ L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ ↓ ↓ L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

1899966

00455 27FEB63

1899950-011	1899950-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 17 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

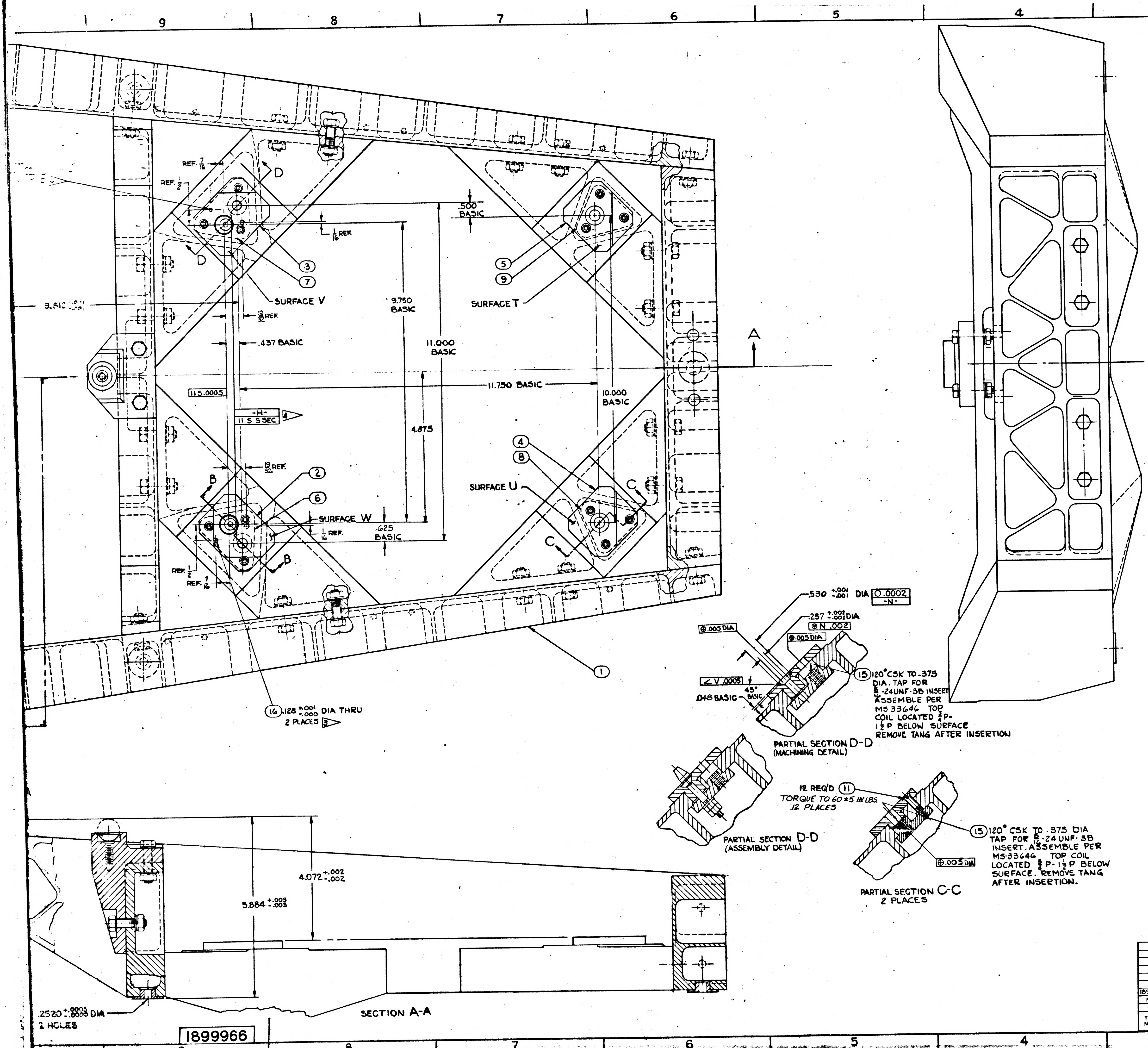
FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO.
SIZE J
1899966
SCALE 1:1
SHEET

1899966

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

E3


REF. 7/16
REF. 1/2
D
D
.500 BASIC
1/16 REF.
③
⑦
⑤
⑨
SURFACE V
9.750 BASIC
SURFACE T
9.812
3/32 REF.
.437 BASIC
11.000 BASIC
A
11.750 BASIC
11 S .0005
-H-
11 S .5 SEC
10.000 BASIC
4.875
19/32 REF.
B
②
⑥
④
⑧
SURFACE U
C
SURFACE W
1/16 REF.
.625 BASIC
C
B
REF. 1/2
REF. 7/16
①
⑯ .128 +.001 -.000 DIA THRU
2 PLACES
.530 +.001 -.001 DIA ○ .0002 -N-
.257 +.002 -.002 DIA
⊕ N .002
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
⑮ 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 1/4 P-1 1/2 P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
12 REQ'D ⑪
TORQUE TO 60 ±5 IN.LBS. 12 PLACES
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
⑮ 120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C
2 PLACES
4.072 +.002 -.002
5.884 +.003 -.003
.2520 +.0005 -.0005 DIA
2 HOLES
SECTION A-A
A

DRAWING INCOMPLETE-
ESTIMATED 12 TAPPED HOLES TO BE ADDED FOR HARNESS CLAMPS.

		REVISIONS			
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS
		TDRR 0104			
E		REVISED IN ACCORDANCE WITH TDRR 0.596			
F		REVISED IN ACCORDANCE WITH TDRR 01836			
G		REVISED IN ACCORDANCE WITH TDRR 01969			
H		REVISED IN ACCORDANCE WITH TDRR 0197O			
J		REVISED IN ACCORDANCE WITH TDRR 0239			
K		REVISED IN ACCORDANCE WITH TDRR 02454		2 AUG 63	

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKE
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK UP, R H REAR
8	1	1899963	L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-IMU MOUNTING, R H REAR
4	1	1899959	L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSE

LIST OF PARTS AND MATERIALS

00456 27FEB

1899950-011	1899950-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 11 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 2-27-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO. | SIZE | 1899966
SCALE 1:1 | SHEET

1899966

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F-2

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE
R WITHIN .0002.

1▷ INSERT MAY BE MACHINED OR LAPPED TO CBTAIN
THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

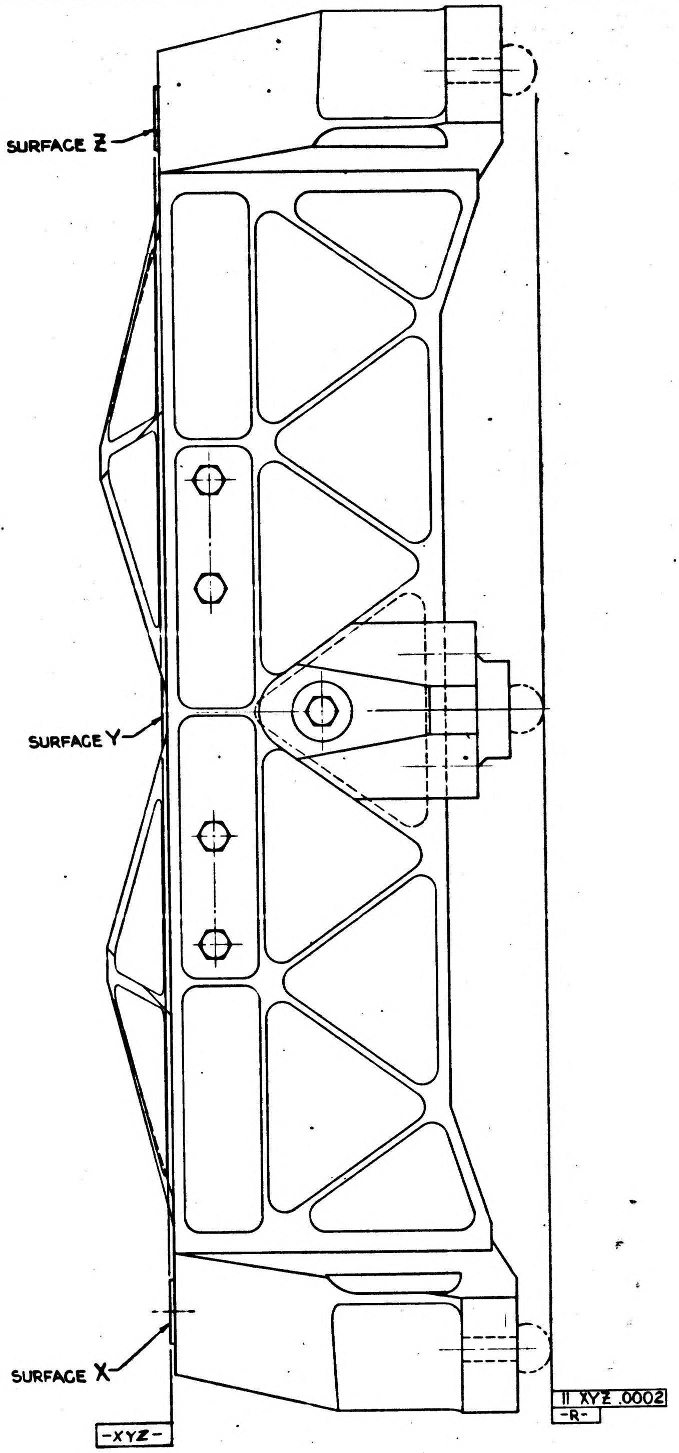
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A
UNIFORM PART TEMPERATURE OF 68°±1°F.

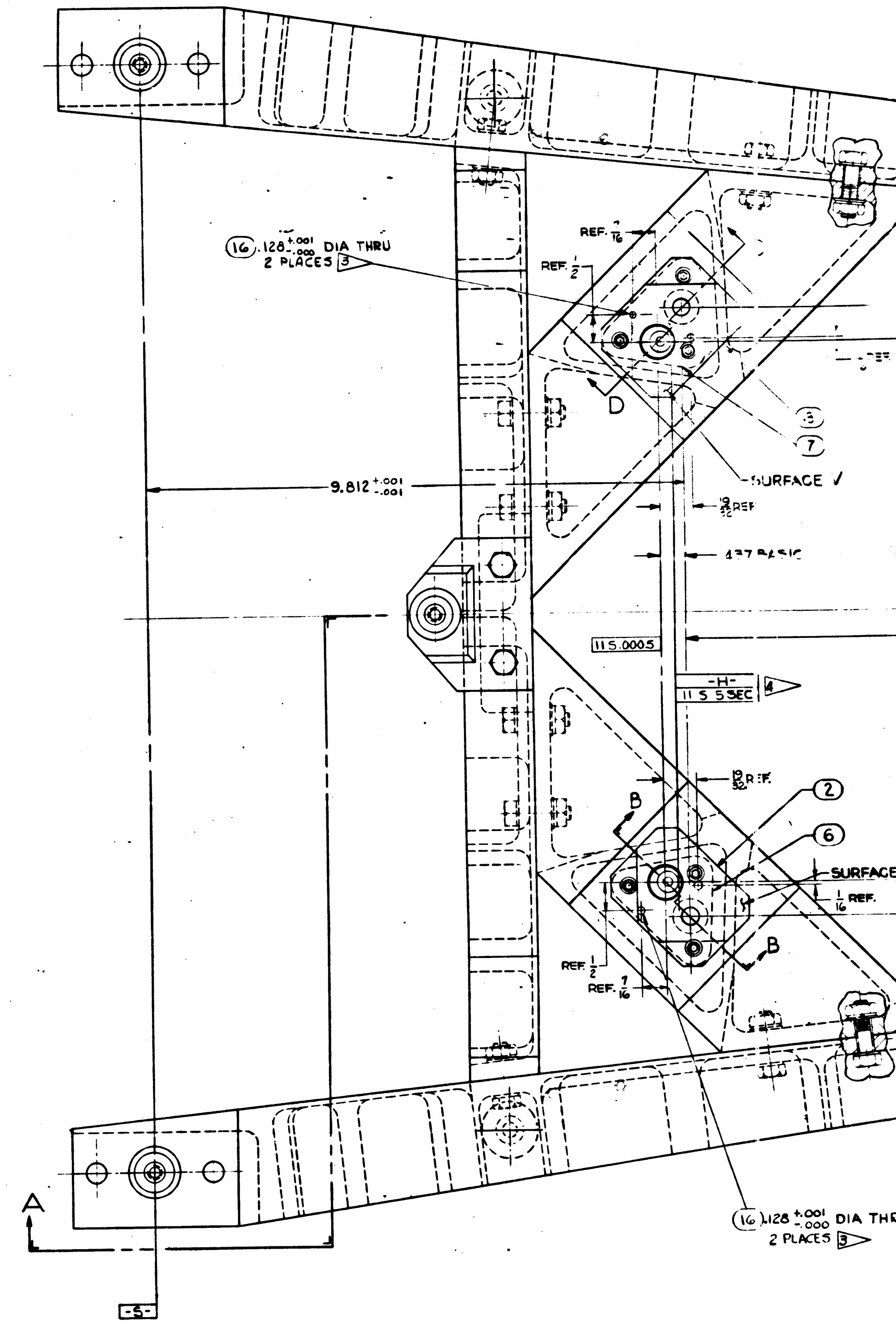
2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE
WITHIN A .000010 TOLERANCE ZONE.

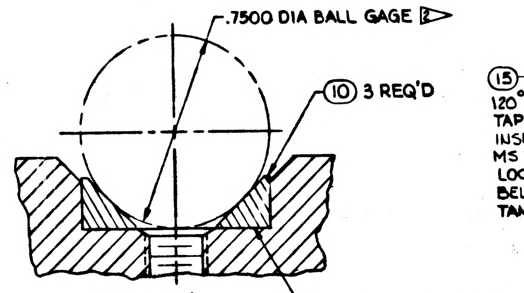
3▷ INSERT PINS 1/16 BELOW SURFACES "V" & "W PRIOR
TO FINISH MACHINING OF THESE SURFACES.

SURFACES T, U, V & W AND OPTICS MOUNTING INSERTS
(ITEM 10) TO BE PROTECTED AT ALL TIMES AFTER FINAL
MACHINING

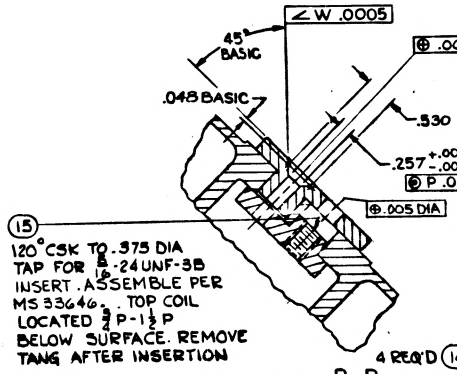
4▷ *AFTER ADJUSTMENT OF DATUM* -H- *TO* -S-
TORQE 1 EACH, ITEM 14, (2 PLACES) TO 85 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- *TO* -S-.
APPLY COMPOUND, MIL-S-40083 (ORD) CLASS 30, TO
THDS. OF ITEM 12 (2 PLACES).
TORQE, 1 EACH, ITEM 14, (2 PLACES TO 60 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- *TO* -S-.


SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
∥ XYZ .0002
-R-

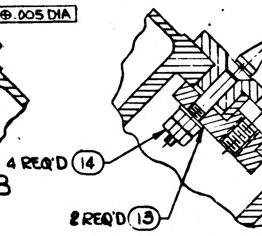

(16) .128 +.001 -.000 DIA THRU
2 PLACES 3▷
REF. 7/16
REF. 1/2
D
(3)
(7)
SURFACE V
9.812 +.001 -.001
19/32 REF
.437 BASIC
∥ S .0005
-H-
∥ S 5 SEC 4▷
19/32 REF.
B
(2)
(6)
SURFACE
1/16 REF.
REF. 1/2
REF. 7/16
B
(16) .128 +.001 -.000 DIA THR
2 PLACES 3▷
A
-S-


.7500 DIA BALL GAGE 2▷
(10) 3 REQ'D
1▷ THIS SURFACE ONLY

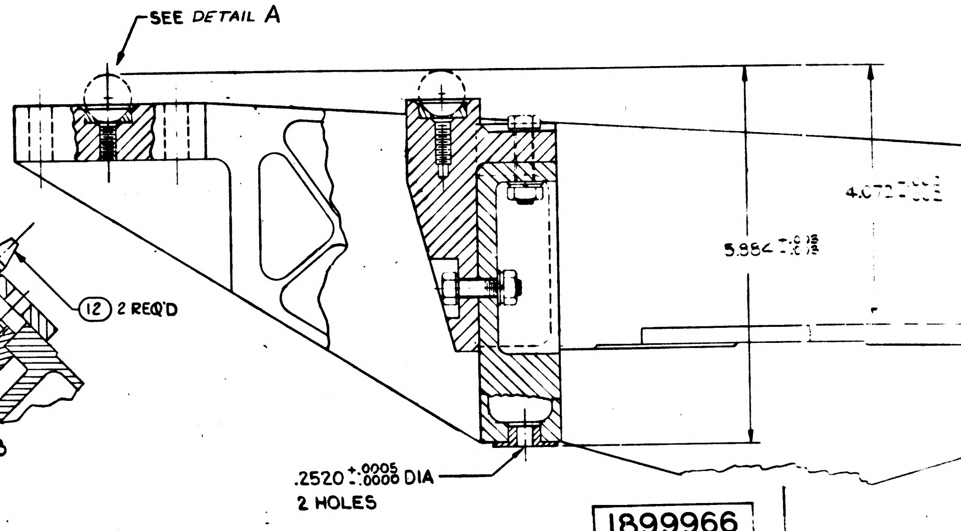
DETAIL A
SCALE 4:1


∠ W .0005
45° BASIC
⊕ .005 DIA
.048 BASIC
.530 +.001 -.001 DIA ○ .0002
-P-
.257 +.002 -.002 DIA
◎ P .002
⊕ .005 DIA
(15)
120° CSK TO .375 DIA
TAP FOR 5/16-24UNF-3B
INSERT. ASSEMBLE PER
MS 33646. . TOP COIL
LOCATED 3/4 P-1 1/2 P
BELOW SURFACE. REMOVE
TANG AFTER INSERTION

PARTIAL SECTION B-B
(MACHINING DETAIL)

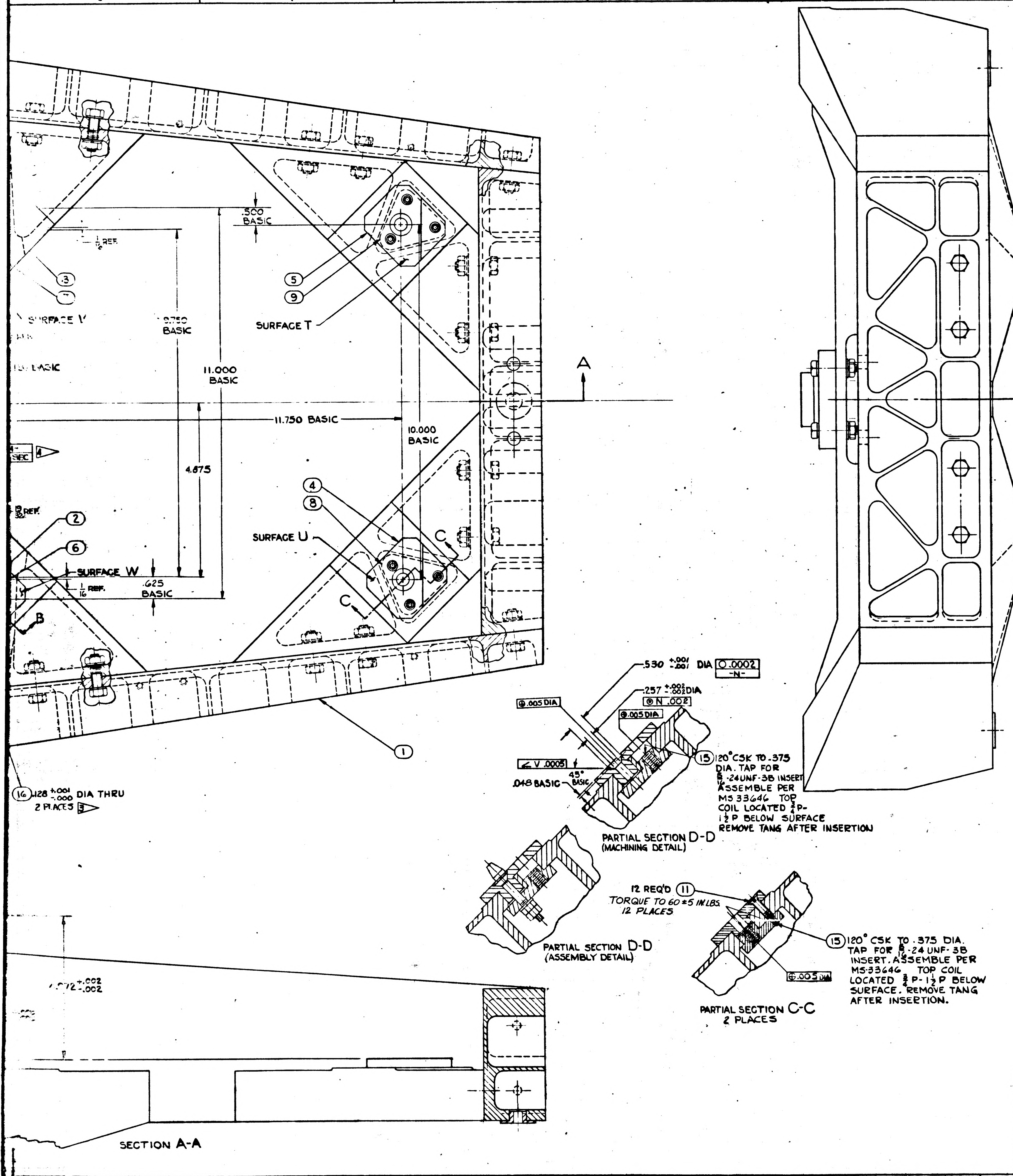

4 REQ'D (14)
(12) 2 REQ'D
2 REQ'D (13)

PARTIAL SECTION B-B
(ASSEMBLY DETAIL)


SEE *DETAIL A*
4.072
5.954
.2520 +.0005 -.0000 DIA
2 HOLES

1899966

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY


8
7
6
5
4
3
2
1
A
.500 BASIC
$\frac{1}{16}$ REF.
③
⑦
⑤
⑨
SURFACE V
SURFACE T
9.750 BASIC
11.000 BASIC
BASIC
11.750 BASIC
10.000 BASIC
4.875
SEC
$\frac{13}{32}$ REF.
②
⑥
④
⑧
SURFACE U
C
C
SURFACE W
$\frac{1}{16}$ REF.
.625 BASIC
B
①
⑯ .128 $^{+.001}_{-.000}$ DIA THRU 2 PLACES
.530 $^{+.001}_{-.001}$ DIA ○ .0002 -N-
.257 $^{+.002}_{-.002}$ DIA
⊕ .005 DIA
⊚ N .002
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
⑮ 120° CSK TO .375 DIA. TAP FOR $\frac{5}{16}$-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED $\frac{3}{4}$P-1$\frac{1}{2}$P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D ⑪
TORQUE TO 60 ±5 IN.LBS. 12 PLACES
⑮ 120° CSK TO .375 DIA. TAP FOR $\frac{5}{16}$-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED $\frac{3}{4}$P-1$\frac{1}{2}$P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
.572 $^{+.002}_{-.002}$
SECTION A-A

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
Ⓜ D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS
		TDRR 01092		14 MAY 63	
E		REVISED IN ACCORDANCE WITH TDRR 01596			
F		REVISED IN ACCORDANCE WITH TDRR 01836			23 Jul 63
G		REVISED IN ACCORDANCE WITH TDRR 01969			
Ⓜ H		REVISED IN ACCORDANCE WITH TDRR 01970			3
Ⓜ J		REVISED IN ACCORDANCE WITH TDRR 02310		6 AUG 63	RWG
Ⓜ K		REVISED IN ACCORDANCE WITH TDRR 02404		12 AUG 63	RWG
Ⓜ L		REVISED IN ACCORDANCE WITH TDRR 02516		20 AUG 63	RWG

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING ¼-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING ¼-28 UNF
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ ↓ ↓ L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ ↓ ↓ L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

1899966

00455 27FEB63

1899950-011	1899950-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
−1/64	−.005	−2°

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 18 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 2-27-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

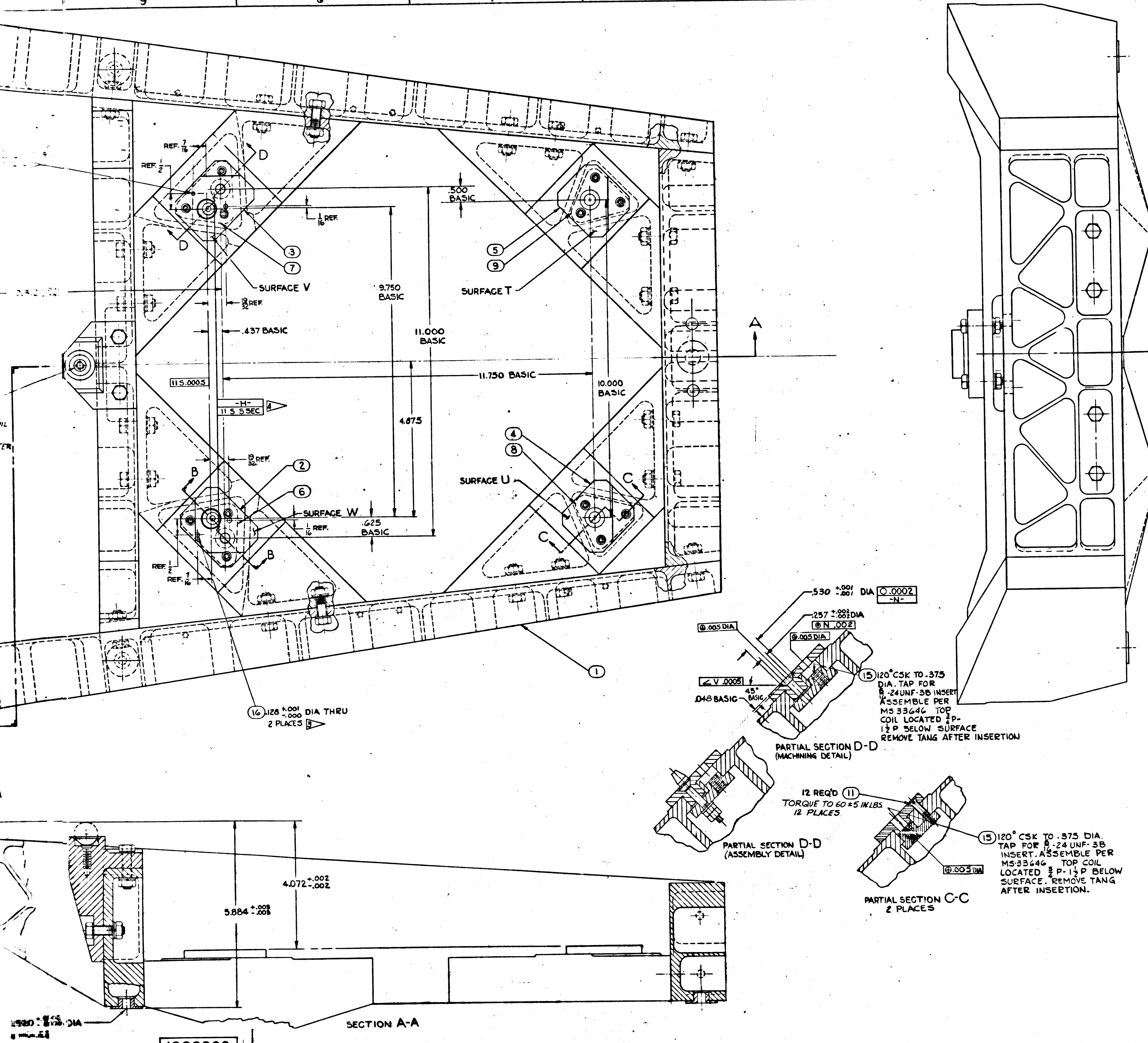
CODE IDENT NO. SIZE J 1899966

SCALE 1:1 SHEET

(3)

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1899966


REF. 7/16
REF. 1/2
D
D
.500 BASIC
1/16 REF.
3
7
5
9
SURFACE V
SURFACE T
19/32 REF.
9.750 BASIC
11.000 BASIC
.437 BASIC
A
11.750 BASIC
11 S .0005
-H-
11 S 5 SEC
4
10.000 BASIC
4.875
19/32 REF.
2
6
4
8
B
SURFACE U
C
SURFACE W
1/16 REF.
.625 BASIC
C
B
REF. 1/2
REF. 7/16
1
16 .128 +.001 -.000 DIA THRU
2 PLACES 3
.530 +.001 -.001 DIA ○ .0002 -N-
.257 +.002 -.002 DIA
◎ N .002
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
15 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
12 REQ'D 11
TORQUE TO 60 ± 5 IN LBS. 12 PLACES
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
15 120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 +.002 -.002
5.884 +.003 -.003
DIA
SECTION A-A

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APP
D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS
		[illegible]			
E		REVISED IN ACCORDANCE WITH TDRR [illegible]			
F		REVISED IN ACCORDANCE WITH TDRR [illegible]			
G		REVISED IN ACCORDANCE WITH TDRR [illegible]			
H		REVISED IN ACCORDANCE WITH TDRR [illegible]			
J		REVISED IN ACCORDANCE WITH TDRR [illegible]		AUG 63	
K		REVISED IN ACCORDANCE WITH TDRR [illegible]		12 AUG 63	
L		REVISED IN ACCORDANCE WITH TDRR [illegible]		20 AUG 63	

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171528	PIN - SPRING,
15	4	MS-21209-F5-15	INSERT - SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER - PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCK
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSE

LIST OF PARTS AND MATERIALS

1899950-011	1899950-011		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES +2° -2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN L. COOPER DATE 10 DEC 62 CHECKED 17 JAN 63 APPROVAL APPROVAL 18 MAR 63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS FRAME ASSEMBLY-NAVIGATION BASE (FINAL MACHINING)
NEXT ASSY	USED ON	APPLICABLE DASH NO.	MATERIAL —	NASA APPROVAL 12-27-63	CODE IDENT NO. / SIZE / 1899966
APPLICATION					
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES			CONTRACT NAS9-497	MIT APPROVAL	SCALE 1:1 / SHEET

00455

1899966 L

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

E2 1899966

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE
R WITHIN .0002.

1▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN
THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

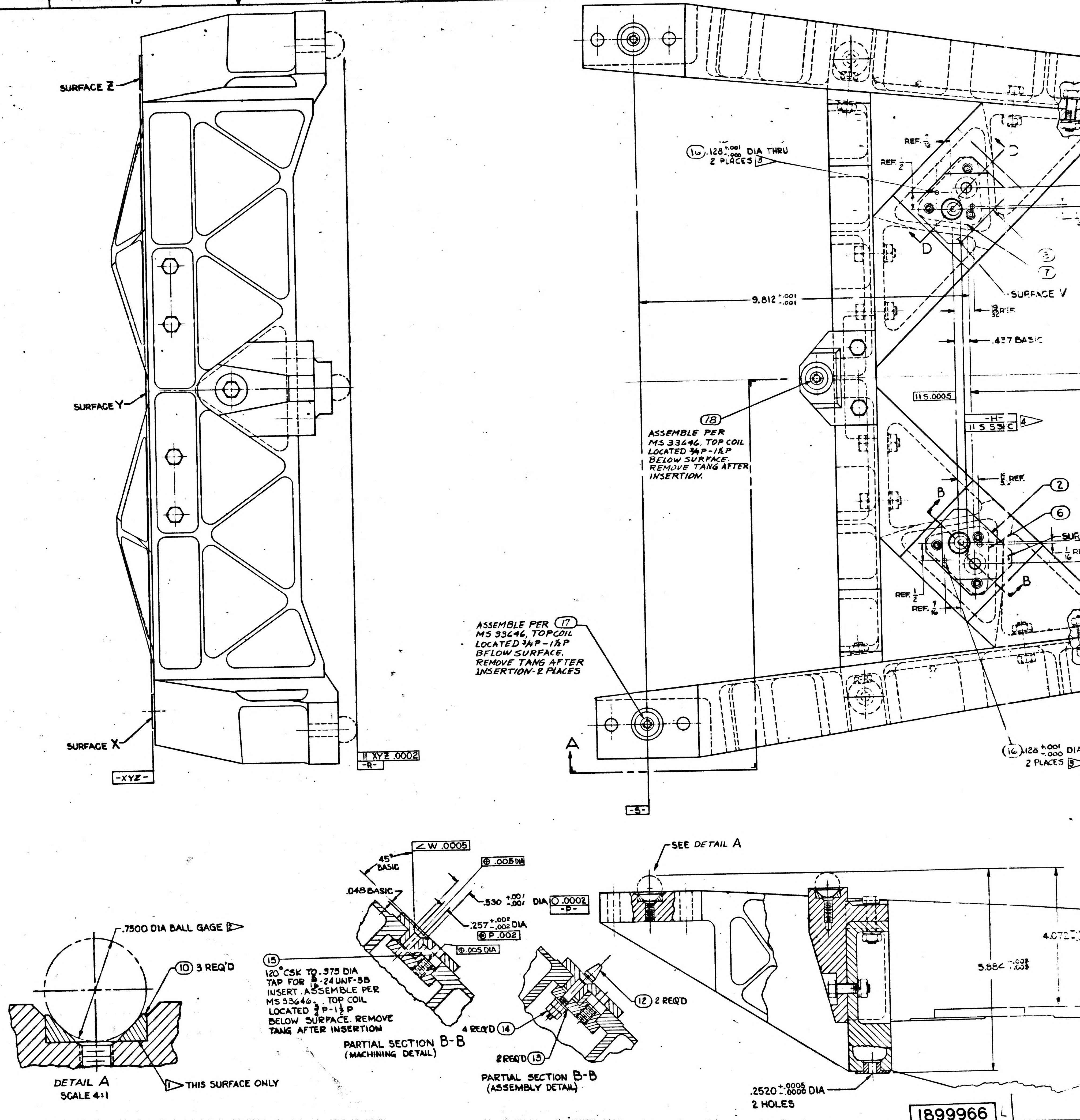
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A
UNIFORM PART TEMPERATURE OF 68°±1°F.

2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE
WITHIN A .000010 TOLERANCE ZONE.

3▷ INSERT PINS 1/16 BELOW SURFACES "V" & "W PRIOR
TO FINISH MACHINING OF THESE SURFACES.

SURFACES T, U, V & W AND OPTICS MOUNTING INSERTS
(ITEM 10) TO BE PROTECTED AT ALL TIMES AFTER FINAL
MACHINING

4▷ *AFTER ADJUSTMENT OF DATUM -H- TO -S-*
TORQE 1 EACH, ITEM 14, (2 PLACES) TO 85 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.
APPLY COMPOUND, MIL-S-40083 (ORD) CLASS 30, TO
THDS. OF ITEM 12 (2 PLACES).
TORQE, 1 EACH, ITEM 14, (2 PLACES TO 60 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.

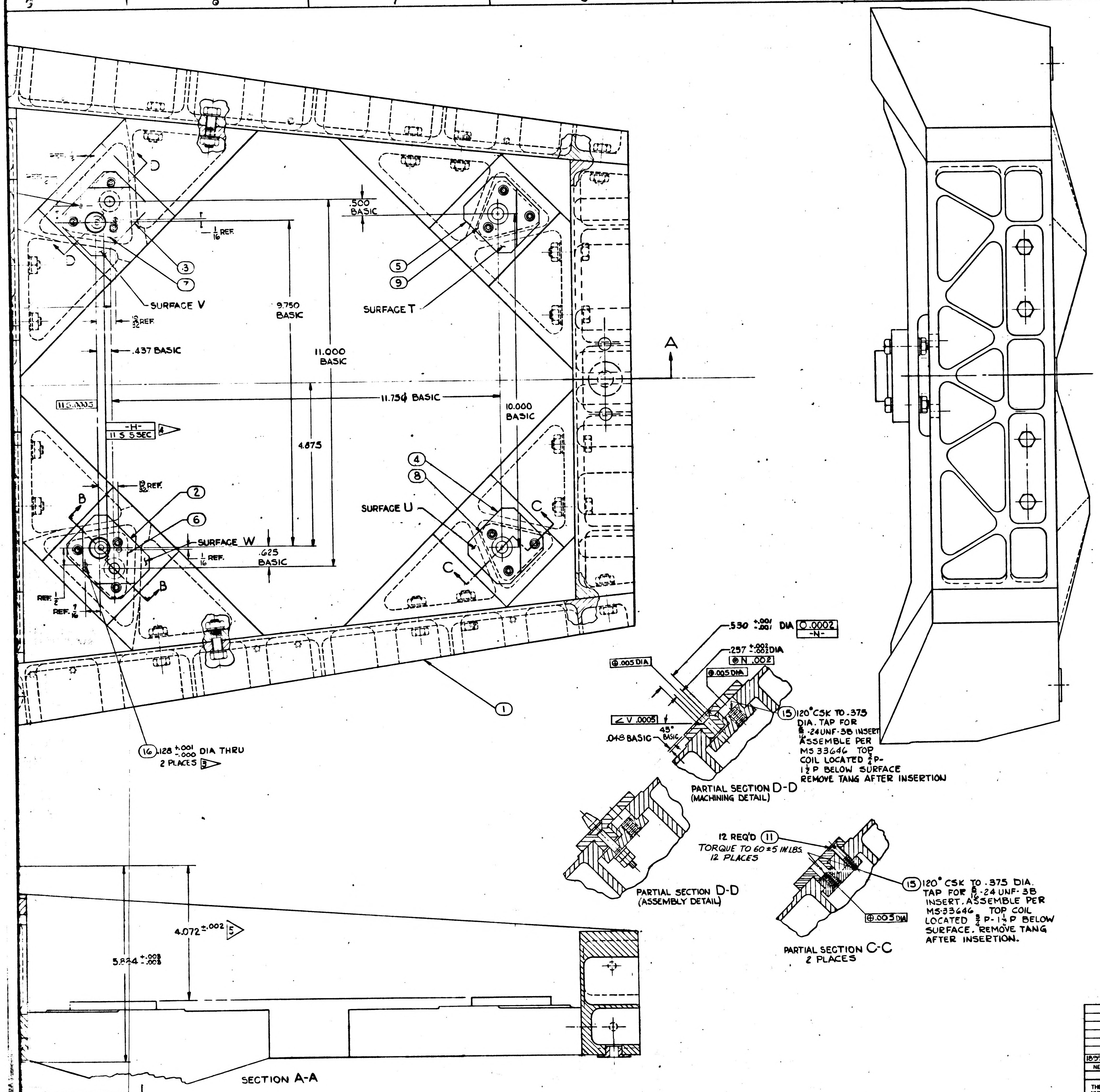

SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
// XYZ .0002
-R-
⑯ .128 +.001 -.000 DIA THRU
2 PLACES 3
REF. 7/16
REF. 1/2
D
⑤
⑦
SURFACE V
9.812 +.001 -.001
13/32 REF.
.437 BASIC
11 S .0005
-H-
11 S .55 C 4
5/8 REF.
②
⑥
B
SUR
1/16 RE
REF. 1/2
REF. 7/16
⑱
ASSEMBLE PER MS 33646, TOP COIL LOCATED 3/4P - 1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
ASSEMBLE PER ⑰ MS 33646, TOPCOIL LOCATED 3/4P - 1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION - 2 PLACES
⑯ .128 +.001 -.000 DIA
2 PLACES 3
A
-S-
SEE DETAIL A
4.072
5.884 +.005 -.005
.2520 +.0005 -.0000 DIA
2 HOLES
.7500 DIA BALL GAGE 2
⑩ 3 REQ'D
1 THIS SURFACE ONLY
DETAIL A
SCALE 4:1
∠ W .0005
45° BASIC
⊕ .005 DIA
.048 BASIC
.530 +.001 -.001 DIA
○ .0002
-P-
.257 +.002 -.002 DIA
◎ P .002
⊕ .005 DIA
⑮
120° CSK TO .375 DIA TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS 33646. TOP COIL LOCATED 3/4 P - 1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION
PARTIAL SECTION B-B
(MACHINING DETAIL)
4 REQ'D ⑭
⑫ 2 REQ'D
8 REQ'D ⑬
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

1899966 L

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

E1 1899966

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
REVISIONS					
D		UPDATED FOR CLASS A RELEASE		27 APR 63	LS
		TDRR 01092		1 MAY	
E		REVISED IN ACCORDANCE WITH TDRR 01596			
F		REVISED IN ACCORDANCE WITH TDRR 01836			
G		REVISED IN ACCORDANCE WITH TDRR 01969			
H		REVISED IN ACCORDANCE WITH TDRR 01970			
J		REVISED IN ACCORDANCE WITH TDRR 02310		6 AUG 63	RWG
K		REVISED IN ACCORDANCE WITH TDRR 02404		12 AUG 63	RWG
L		REVISED IN ACCORDANCE WITH TDRR 02516		20 AUG 63	RWS
M		REVISED PER TDRR NO. 03.0			


.500 BASIC
1/16 REF.
③
⑦
SURFACE V
9.750 BASIC
11.000 BASIC
⑤
⑨
SURFACE T
19/32 REF.
.437 BASIC
A
11.75Ø BASIC
10.000 BASIC
11 S .0005
-H-
11 S 5 SEC
4
4.875
④
⑧
SURFACE U
19/32 REF.
②
⑥
SURFACE W
1/16 REF.
.625 BASIC
B
C
REF. 1/2
REF. 7/16
D
①
⑯ .128 +.001 -.000 DIA THRU 2 PLACES 3
.530 +.001 -.001 DIA ○ .0002 -N-
.257 +.002 -.002 DIA
⊕ .005 DIA
◎ N .002
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
⑮ 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D ⑪
TORQUE TO 60 ± 5 IN.LBS. 12 PLACES
⑮ 120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 ±.002 5
5.884 +.003 -.003
SECTION A-A

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ L H REAR
7	1	1899962	↓ R H FRONT
6	1	1899961	↓ L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ L H REAR
3	1	1899958	↓ R H FRONT
2	1	1899957	↓ L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

M

1899966

00455 27FEB63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1899950-011	1899950-011	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 18 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

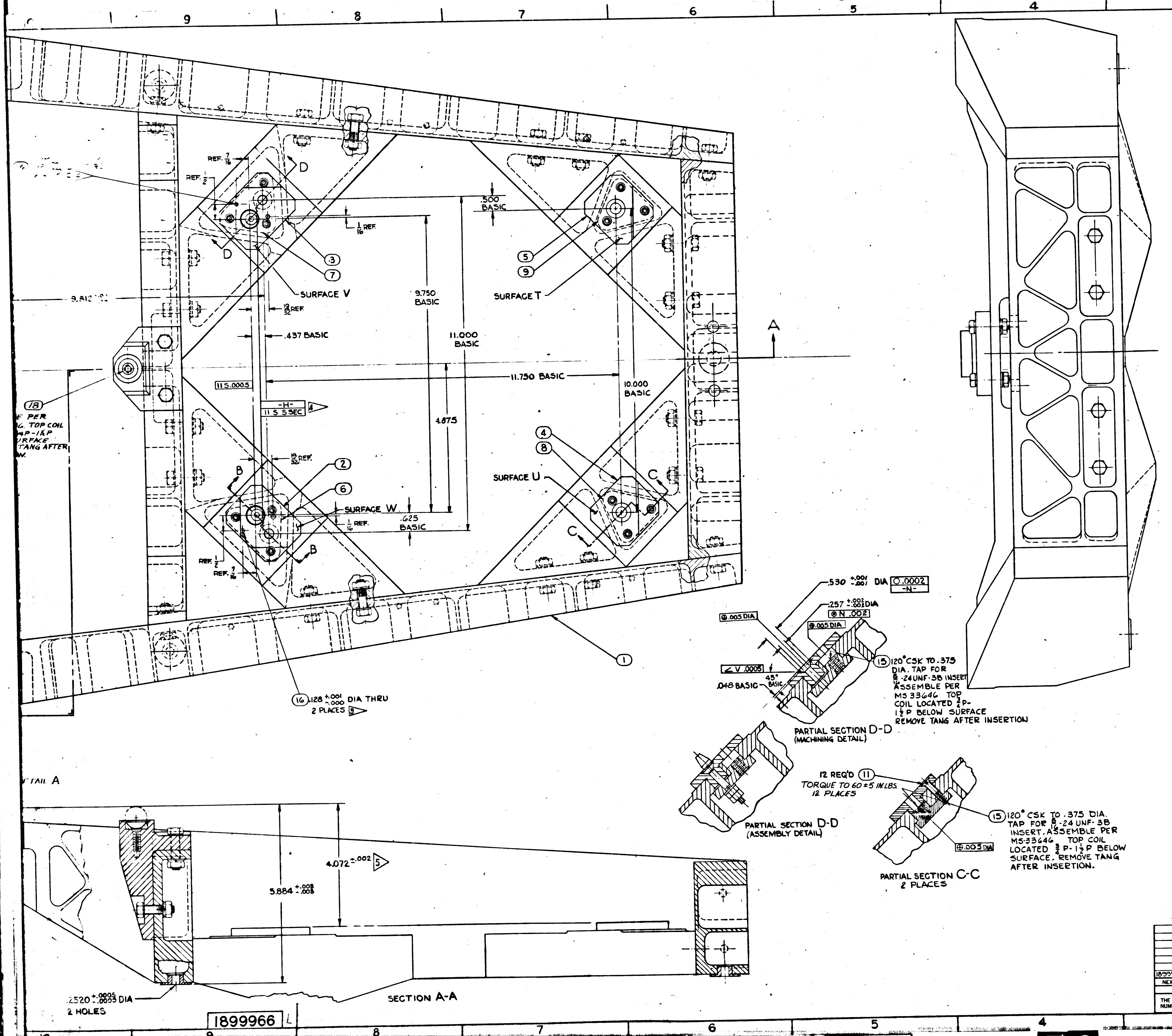
FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO.
SIZE J
1899966
SCALE 1:1
SHEET

1899966

INCHES
PHOTOGRAPHIC SCALE ONLY

E3


9
8
7
6
5
4
3
2
1
REF. 7/16
REF. 1/2
D
D
.500 BASIC
1/16 REF.
3
7
5
9
SURFACE V
SURFACE T
9.750 BASIC
9.812
13/32 REF.
.437 BASIC
11.000 BASIC
A
11.750 BASIC
10.000 BASIC
115.0005
-H-
11 5 5SEC
4
4.875
18
E PER
G. TOP COIL
MP-1½P
URFACE
TANG AFTER
N.
13/32 REF.
2
6
4
8
SURFACE U
C
C
B
B
SURFACE W
1/16 REF.
.625 BASIC
REF. 1/2
REF. 7/16
1
16 .128 +.001 -.000 DIA THRU
2 PLACES 3
.530 +.001 -.001 DIA 0.0002 -N-
.257 +.001 -.002 DIA
⊕ N .002
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
15
TAIL A
12 REQ'D 11
TORQUE TO 60 ± 5 IN LBS.
12 PLACES
15
⊕ .005 DIA
4.072 ±.002 5
5.884 +.003 -.003
.2520 +.0005 -.0000 DIA
2 HOLES
1899966 L

120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED ¾P-1½P BELOW SURFACE REMOVE TANG AFTER INSERTION

PARTIAL SECTION D-D (MACHINING DETAIL)

PARTIAL SECTION D-D (ASSEMBLY DETAIL)

120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED ¾P-1½P BELOW SURFACE. REMOVE TANG AFTER INSERTION.

PARTIAL SECTION C-C
2 PLACES

SECTION A-A

SYM	ZONE	DESCRIPTION	CHG NO
D		UPDATED FOR CLASS A RELEASE	
		TDRR 0[illegible]	
E		REVISED IN ACCORDANCE WITH TDRR 01590	
F		REVISED IN ACCORDANCE WITH TDRR 01880	
G		REVISED IN ACCORDANCE WITH TDRR 0[illegible]353	
H		REVISED IN ACCORDANCE WITH TDRR 0970	
J		REVISED IN ACCORDANCE WITH TDRR 02319	
K		REVISED IN ACCORDANCE WITH TDRR 02404	
L		REVISED IN ACCORDANCE WITH TDRR 02516	
M		REVISED PER TDRR NO. 0350	

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING
17	2	MS-21209-F4-15	INSERT-SELF LOCKING
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100
10	3	1899965	INSERT-OPTICS MO
9	1	1899964	PLATE-BACK-UP, R
8	1	1899963	L
7	1	1899962	R
6	1	1899961	L
5	1	1899960	PAD-IMU MOUNTING
4	1	1899959	
3	1	1899958	
2	1	1899957	
1	1	1899955	STRUCTURAL ASSY.-NA

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1899950-011	1899950-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL ——
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 6 DEC 62
CHECKED 17 JAN 63
APPROVAL
APPROVAL 18 MAR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CE
HOUSTON, TE

FRAME ASSE
NAVIGATION BA
(FINAL MAT

CODE IDENT NO
SIZE -
'899
SCALE

00456

F2

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16√

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001

1▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68°±1°F.

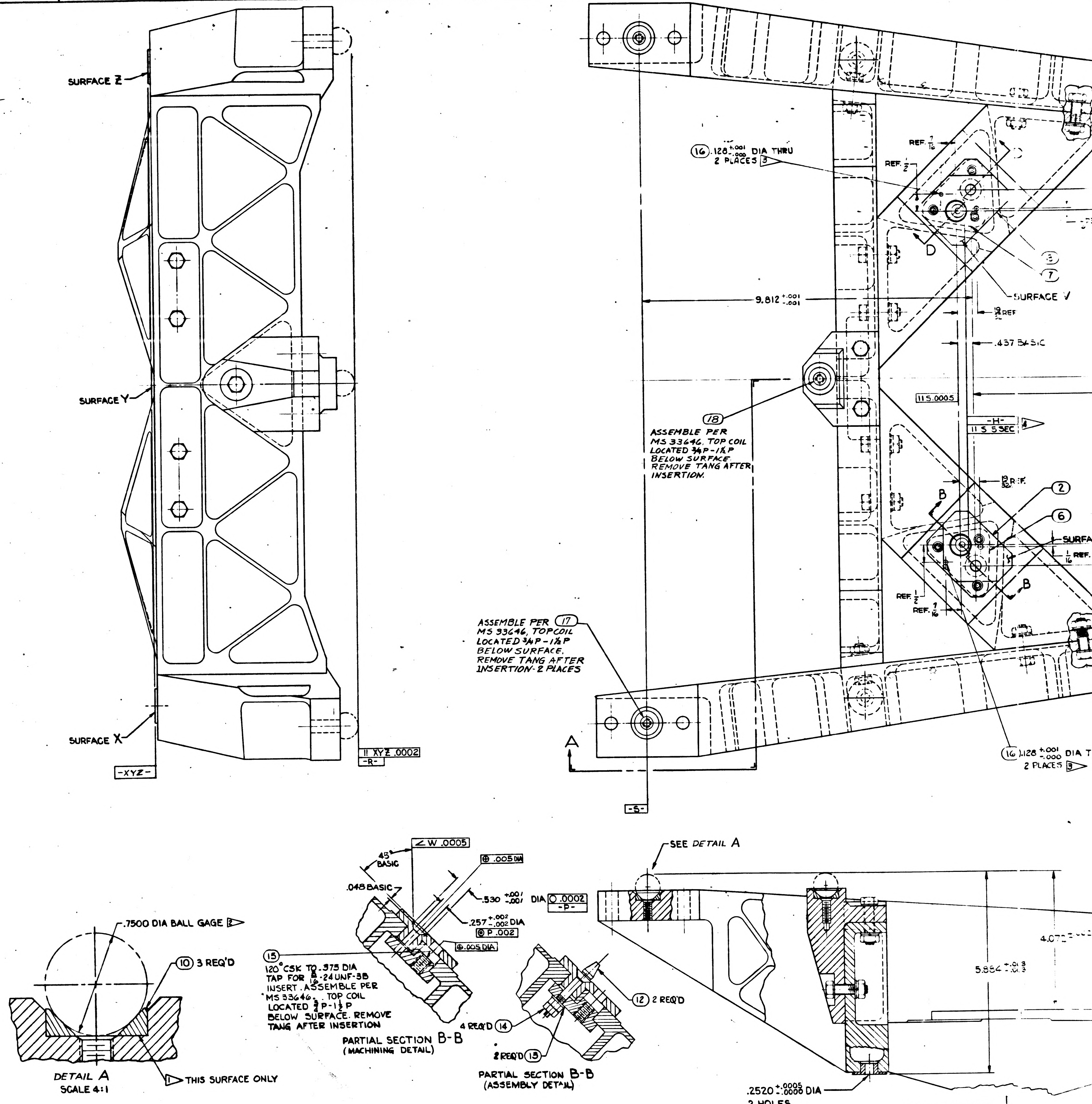
2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

3▷ INSERT PINS $\frac{1}{16}$ BELOW SURFACES "V" & "W PRIOR TO FINISH MACHINING OF THESE SURFACES.

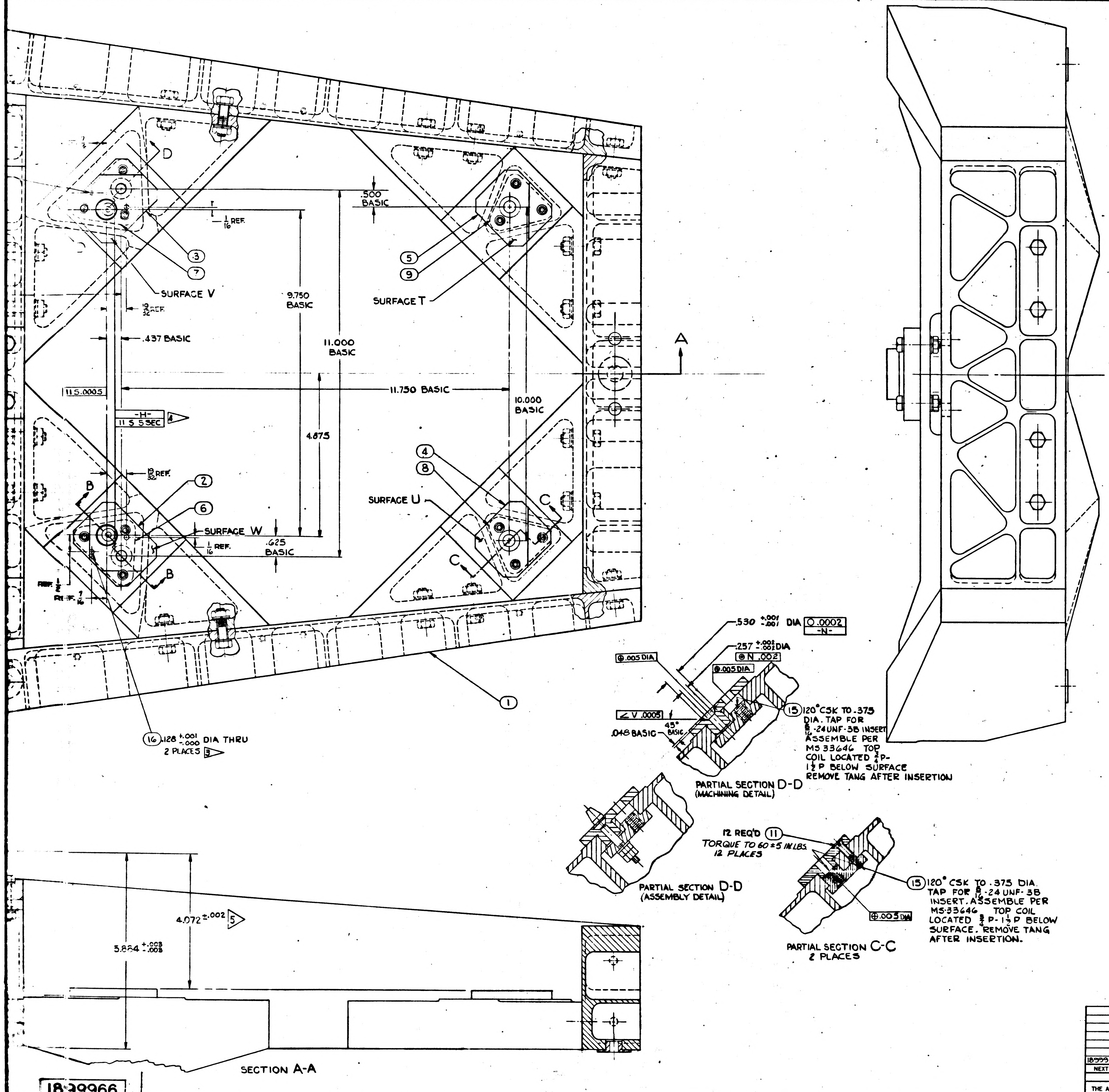
SURFACES T, U, V & W AND OPTICS MOUNTING INSERTS (ITEM 10) TO BE PROTECTED AT ALL TIMES AFTER FINAL MACHINING

4▷ *AFTER ADJUSTMENT OF DATUM -H- TO -S-*
TORQE 1 EACH, ITEM 14, (2 PLACES) TO 85 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.
APPLY COMPOUND, MIL-S-40083 (ORD) CLASS 30, TO THDS. OF ITEM 12 (2 PLACES).
TORQE, 1 EACH, ITEM 14, (2 PLACES TO 60 ± 5 IN. LBS.
RECHECK ALIGNMENT OF DATUM -H- TO -S-.

5▷ THE ESTABLISHED DIMENSION SHALL NOT VARY MORE THAN .0002 FROM SURFACE R TO ANY POINT ON SURFACES T, U, V & W.


SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
II XYZ .0002
-R-
16 .128 +.001 -.000 DIA THRU
2 PLACES 3
REF. 7/16
REF. 1/2
D
3
7
SURFACE V
9.812 +.001 -.001
19/32 REF
.437 BASIC
115.0005
-H-
11 S 5 SEC 4
18
ASSEMBLE PER MS 33646, TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE REMOVE TANG AFTER INSERTION.
19/32 REF.
2
6
B
SURFA
1/16 REF.
REF. 1/2
REF. 7/16
ASSEMBLE PER 17 MS 33646, TOPCOIL LOCATED 3/4P-1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION-2 PLACES
A
-S-
16 .128 +.001 -.000 DIA T
2 PLACES 3
SEE DETAIL A
.7500 DIA BALL GAGE 2
10 3 REQ'D
DETAIL A
SCALE 4:1
1 THIS SURFACE ONLY
∠ W .0005
45° BASIC
.048 BASIC
⊕ .005 DIA
.530 +.001 -.001 DIA ○ .0002 -P-
.257 +.002 -.002 DIA
◎ P .002
⊕ .005 DIA
15
120° CSK TO .375 DIA TAP FOR 5/16-24UNF-3B INSERT. ASSEMBLE PER MS 33646. TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION
PARTIAL SECTION B-B
(MACHINING DETAIL)
12 2 REQ'D
4 REQ'D 14
2 REQ'D 13
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)
5.884 +.003 -.003
4.072
.2520 +.0005 -.0000 DIA
2 HOLES

1899966


SURFACE V
SURFACE T
SURFACE U
SURFACE W
.500 BASIC
9.750 BASIC
11.000 BASIC
11.750 BASIC
10.000 BASIC
4.875
.437 BASIC
.625 BASIC
$\frac{1}{16}$ REF.
$\frac{19}{32}$ REF.
-H-
A
B
C
D
.530 +.001 -.001 DIA ○ .0002 -N-
.257 +.002 -.002 DIA
⊕ .005 DIA
◎ N .002
∠ V .0005
.048 BASIC
45° BASIC
⑮ 120° CSK TO .375 DIA. TAP FOR $\frac{5}{16}$-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED $\frac{3}{4}$P-1$\frac{1}{2}$P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D ⑪ TORQUE TO 60 ± 5 IN LBS. 12 PLACES
⑮ 120° CSK TO .375 DIA. TAP FOR $\frac{5}{16}$-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED $\frac{3}{4}$P-1$\frac{1}{2}$P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
⑯ .128 +.001 -.000 DIA THRU 2 PLACES
4.072 ±.002
5.864 +.003 -.003
SECTION A-A
①
②
③
④
⑤
⑥
⑦
⑧
⑨
1899966

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
ⓜ D		UPDATED FOR CLASS A RELEASE TDRR 01092		27 APR 63	LS
E		REVISED IN ACCORDANCE WITH TDRR 01596			
F		REVISED IN ACCORDANCE WITH TDRR 01836			23 Aug 63
G		REVISED IN ACCORDANCE WITH TDRR 01969			
ⓜ H		REVISED IN ACCORDANCE WITH TDRR 01970			3
ⓜ J		REVISED IN ACCORDANCE WITH TDRR 02310		6 AUG 63	
ⓜ K		REVISED IN ACCORDANCE WITH TDRR 02404		12 AUG 63	
ⓜ L		REVISED IN ACCORDANCE WITH TDRR 02516		20 AUG 63	
ⓜ M		REVISED PER TDRR NO. 03.0.			"
N		REVISED PER TDRR NO. 03674		21 OCT 63	"

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ L H REAR
7	1	1899962	↓ R H FRONT
6	1	1899961	↓ L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ L H REAR
3	1	1899958	↓ R H FRONT
2	1	1899957	↓ L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

1899966

00455 27FEB63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1899950-011	1899950-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL 18 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL 2-27-63
MIT APPROVAL

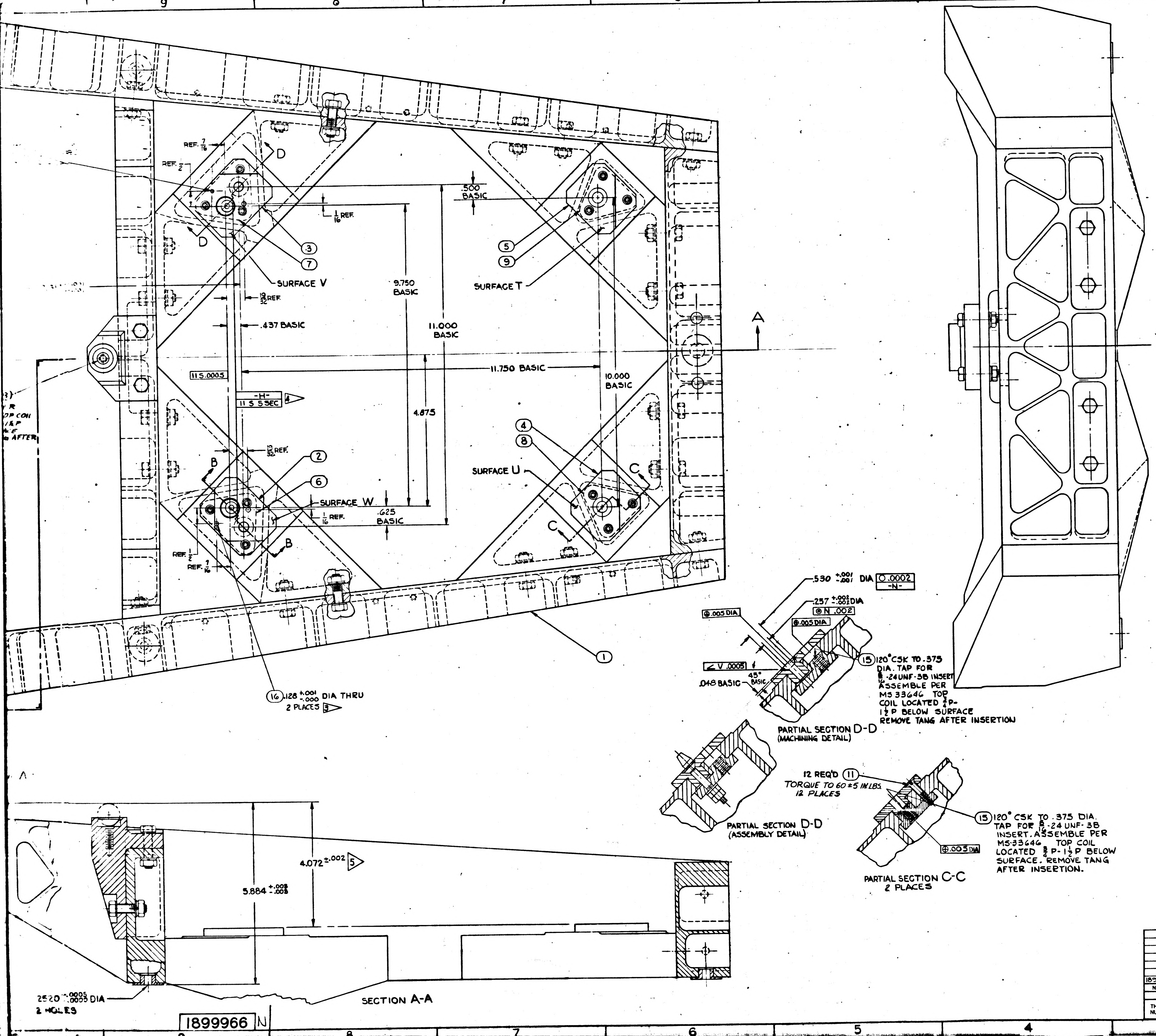
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO.
SIZE J
1899966
SCALE 1:1
SHEET

E3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		UPDATED FOR CLASS A RELEASE		27 APR 63	65
E		REVISED IN ACCORDANCE WITH TDRR 01596			
F		REVISED IN ACCORDANCE WITH TDRR 0185[illegible]			
G		REVISED IN ACCORDANCE WITH TDRR 01[illegible]			
H		REVISED IN ACCORDANCE WITH TDRR [illegible]			
J		REVISED IN ACCORDANCE WITH TDRR 023[illegible]		6 AUG 63	
K		REVISED IN ACCORDANCE WITH TDRR 024[illegible]		12 AUG 63	
L		REVISED IN ACCORDANCE WITH TDRR 02[illegible]6		20 AUG	
M		REVISED PER TDRR NO [illegible]			
N		REVISED PER TDRR NO 03[illegible]74		2 OCT	



REF. 7/16
REF. 1/2
D
.500 BASIC
1/16 REF.
3
7
5
9
SURFACE V
9.750 BASIC
SURFACE T
11.000 BASIC
13/32 REF.
.437 BASIC
A
115.0005
11.750 BASIC
10.000 BASIC
-H-
11 S .5 SEC
4.875
4
8
2
6
B
SURFACE U
C
13/32 REF.
SURFACE W
1/16 REF.
.625 BASIC
REF. 1/2
REF. 7/16
1
16 .128 +.001 -.000 DIA THRU 2 PLACES 3
.530 +.001 -.001 DIA ○.0002 -N-
.257 +.002 -.002 DIA
⊚N .002
⊕.005 DIA
∠V .0005
.048 BASIC
45° BASIC
15 120° CSK TO .375 DIA. TAP FOR 5/16-24UNF-3B INSERT ASSEMBLE PER MS 33646 TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE REMOVE TANG AFTER INSERTION
PARTIAL SECTION D-D (MACHINING DETAIL)
12 REQ'D 11 TORQUE TO 60 ±5 IN.LBS. 12 PLACES
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
15 120° CSK TO .375 DIA. TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS-33646 TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION.
⊕.005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 ±.002 5
5.884 +.003 -.003
.2520 +.0005 -.0000 DIA 2 HOLES
SECTION A-A

18	1	MS-21209-F4-20	INSERT-SELF LOCKING 1/4-28 UNF
17	2	MS-21209-F4-15	INSERT-SELF LOCKING 1/4-28 UNF
16	4	MS-171528	PIN-SPRING,
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ ↓ ↓ L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ ↓ ↓ L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)
ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

1899966

00456 27FEB63

1899950-011	1899950-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 10 DEC 62
CHECKED 17 JAN 63
APPROVAL
APPROVAL 18 JAN 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

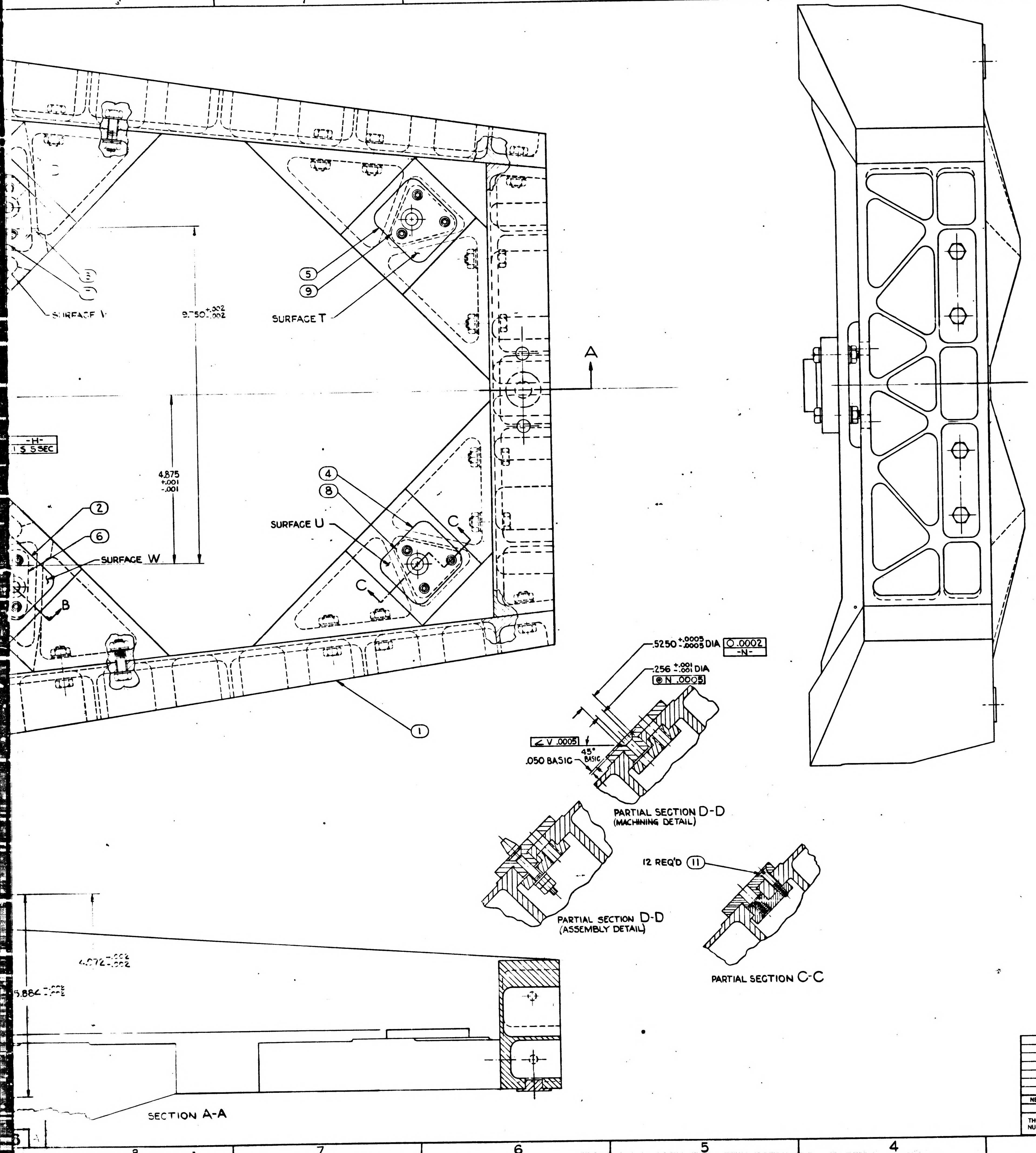
FRAME ASSEMBLY - NAVIGATION BASE (FINAL MACHINING)

CODE IDENT NO. | SIZE J | 1899966
SCALE 1:1 | SHEET

1899966 N

F-2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		Ⓐ [illegible] [illegible] TO ASSEMBLY	[illegible]	[illegible]	AJ



SURFACE V
9.750 +.002 -.002
SURFACE T
⑤
⑨
A
-H-
SURFACE U
SURFACE W
4.875 +.001 -.001
②
⑥
④
⑧
C
C
B
①
.5250 +.0005 -.0005 DIA ○ .0002 -N-
.256 +.001 -.001 DIA ◎ N .0005
∠ V .0005
45° BASIC
.050 BASIC
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D ⑪
PARTIAL SECTION C-C
4.072 +.002 -.002
5.884 +.002 -.002
SECTION A-A

ITEM NO	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
14	4	AN315-4R	NUT-PLAIN
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284 - 312	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	↓ L H REAR
7	1	1899962	↓ R H FRONT
6	1	1899961	↓ L H FRONT
5	1	1899960	PAD-I M U MOUNTING, R H REAR
4	1	1899959	↓ L H REAR
3	1	1899958	↓ R H FRONT
2	1	1899957	↓ L H FRONT
1	1	1899955	STRUCTURAL ASSY.-NAV. BASE (INSEP.)

LIST OF PARTS AND MATERIALS

1899966

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00455 DATE 27 Feb 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 10 DEC 62
CHECKED Taylor 17 JAN 63
APPROVAL [illegible] 17 JAN 63
APPROVAL [illegible] 18 JAN 63
NASA APPROVAL W J [illegible] 2-27-63
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY -
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO. SIZE J 1899966

SCALE 1:1 SHEET

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R. OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 15√ AA

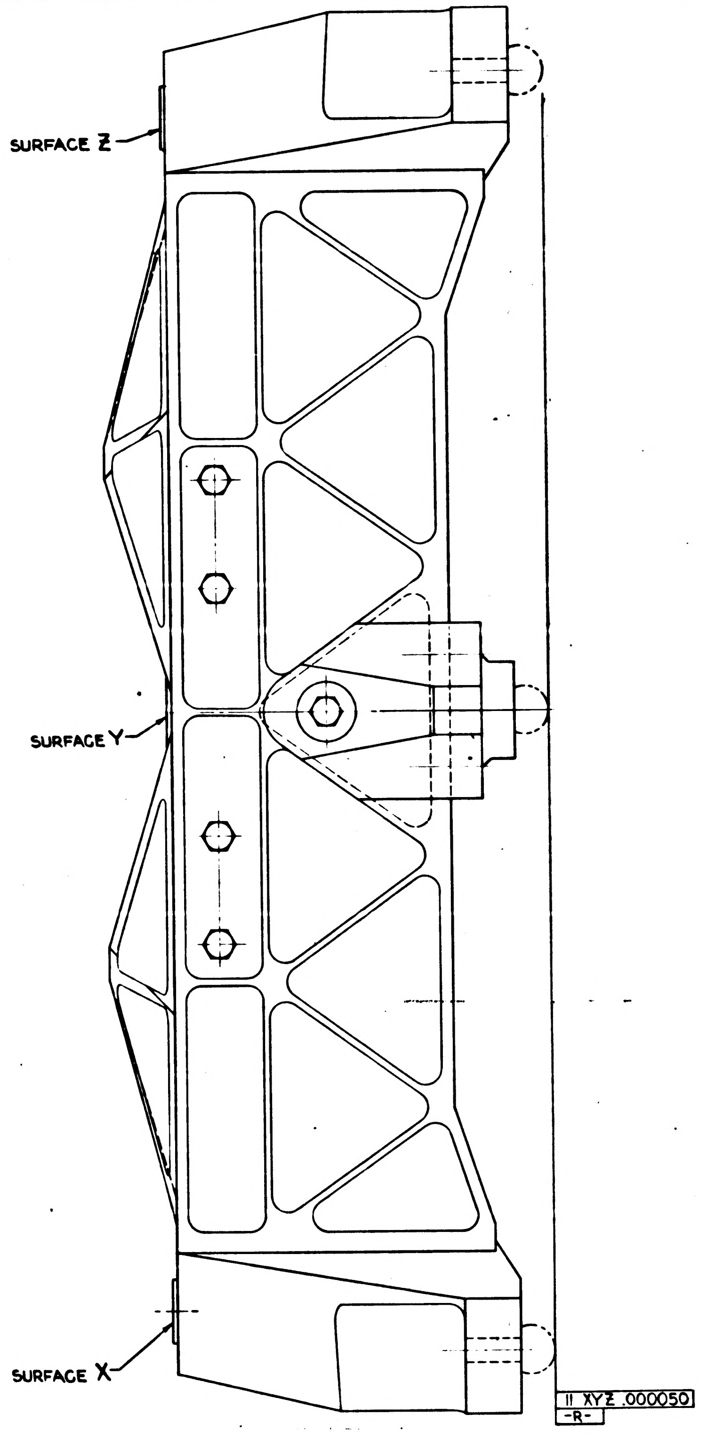
MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

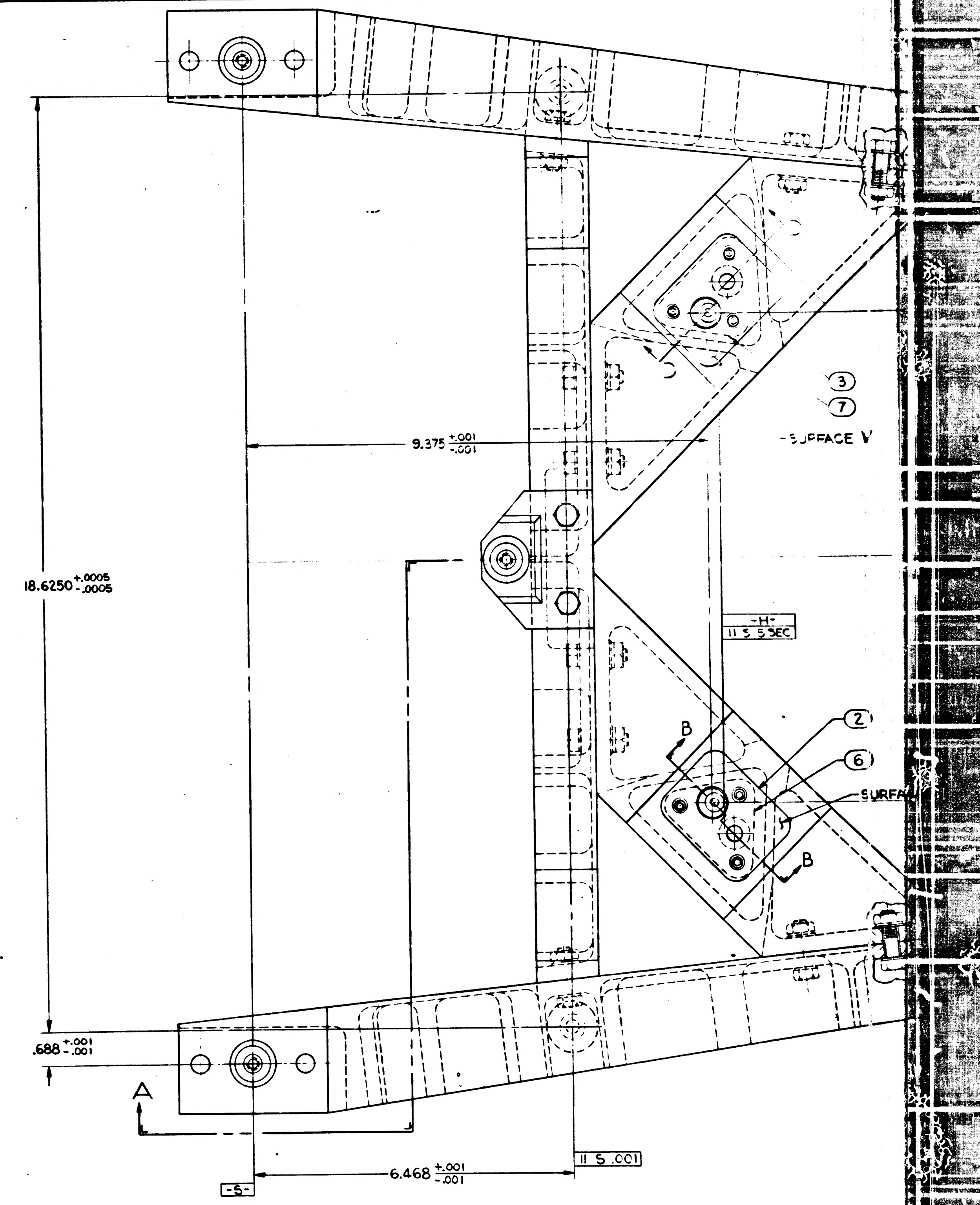
1▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

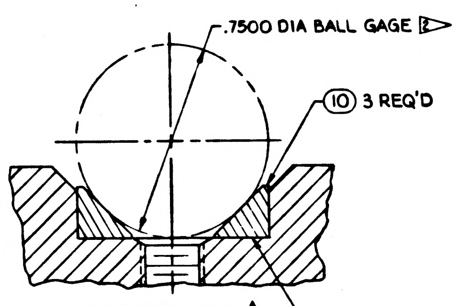
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68°±1°F.

2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

APPLY LOCKTITE MIL-S-40083 (ORD) CLASS 30 TO JAM NUTS AFTER ADJUSTMENT OF DATUM -H- TO -S-.

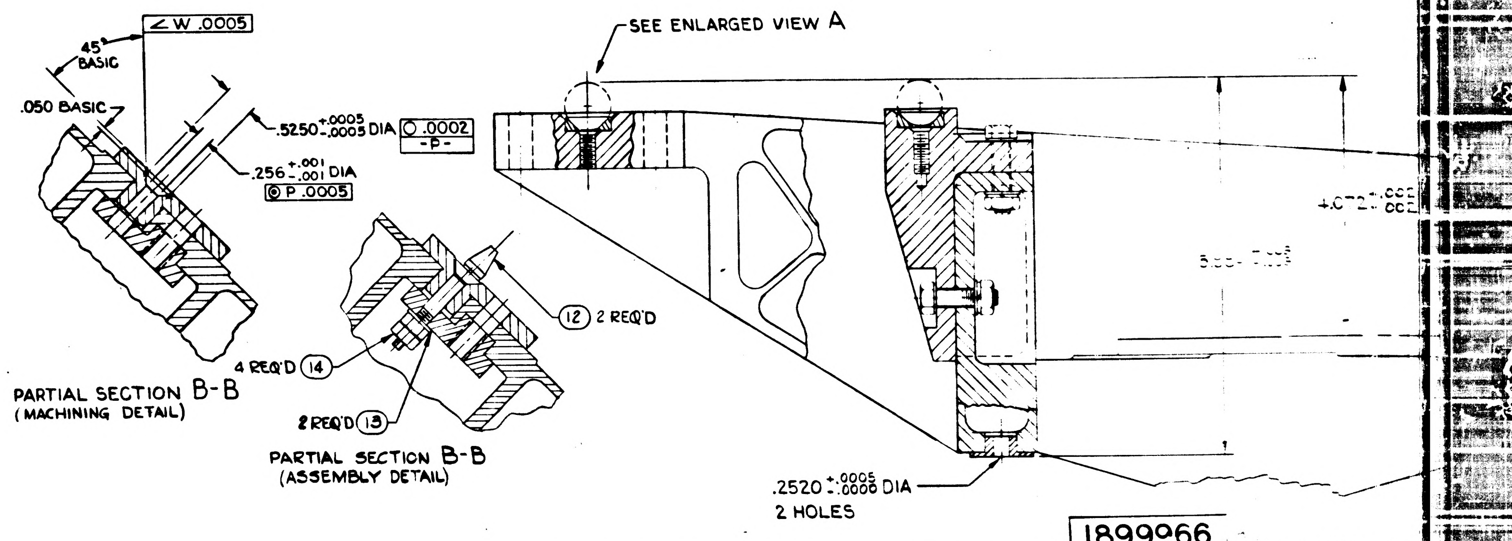

SURFACE Z
SURFACE Y
SURFACE X
∥ XYZ .000050
-R-


18.6250 +.0005 -.0005
9.375 +.001 -.001
.688 +.001 -.001
6.468 +.001 -.001
-S-
∥ S .001
-H-
∥ S 5 SEC
③
⑦
SURFACE V
②
⑥
SURFA
B
B
A


.7500 DIA BALL GAGE 2▷
⑩ 3 REQ'D
1▷

ENLARGED VIEW A
SCALE 4:1

1▷ THIS SURFACE ONLY


∠ W .0005
45° BASIC
.050 BASIC
.5250 +.0005 -.0005 DIA
○ .0002 -P-
.256 +.001 -.001 DIA
◎ P .0005
⑫ 2 REQ'D
4 REQ'D ⑭
2 REQ'D ⑬
SEE ENLARGED VIEW A
.2520 +.0005 -.0000 DIA
2 HOLES

PARTIAL SECTION B-B
(MACHINING DETAIL)

PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

1899966

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		UPGRADED FOR CLASS A RELEASE TPR 0071		27. APR. 63	A.J.F. / WK

Ⓜ

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1 ▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 440 C, COND A.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005-.015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 125√

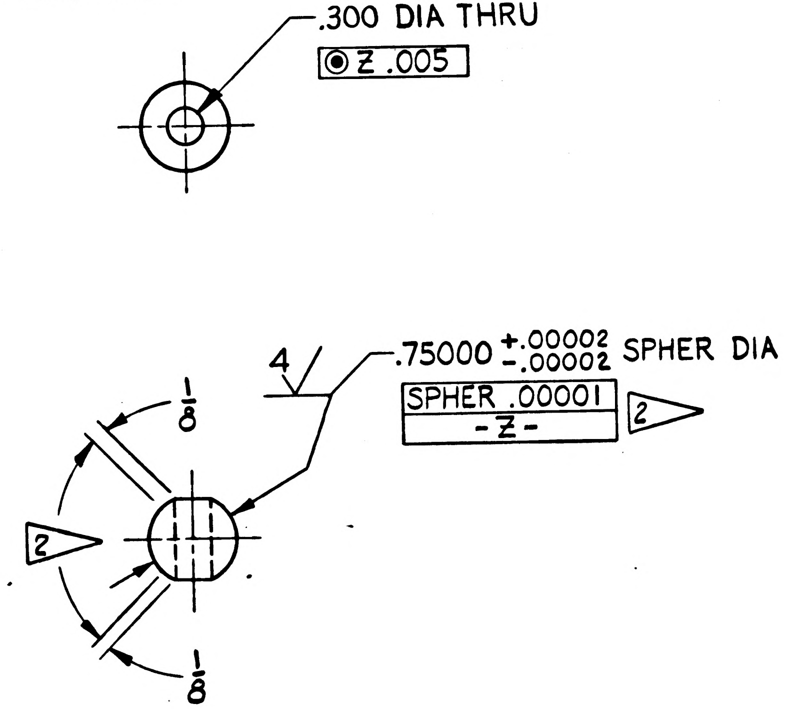
MUST BE FREE FROM BURRS.

HEAT TREAT PER MIL-H-6875 TO R_C 58-60.

IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

TO BE INDIVIDUALLY PACKAGED IN PRESERVATION PACKAGING PER MIL-B-197.

2 ▷ SPHERICITY REQUIREMENTS APPLY ONLY TO AREA INDICATED.



00298
23 Jan 63

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.005	+ —
— —	−.005	— —

DO NOT SCALE THIS DRAWING

MATERIAL 1 ▷
J Smi 18 Jan 63
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C. LENZ DATE 11 DEC '62
CHECKED J Sayles 17 JAN 63
APPROVAL J. Hamm 18 JAN 63
APPROVAL A Kodel 18 JAN 63
NASA APPROVAL W J Rhine 1-23-63 R. Bras
MIT APPROVAL W Kupfer 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BALL - PRECISION

CODE IDENT NO.
SIZE C
1899967
SCALE FULL
SHEET

MIL 1077C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899967C

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1▷ MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 440 C, COND A.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005-.015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 125√.

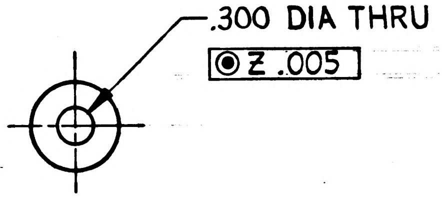
MUST BE FREE FROM BURRS.

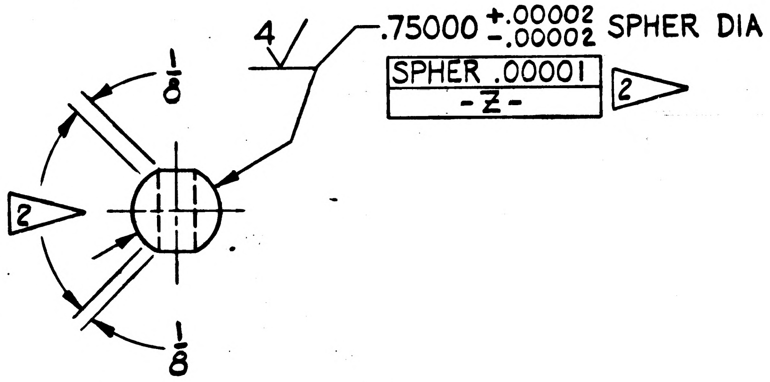
HEAT TREAT PER MIL-H-6875 TO R_c 58-60.

IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

PACKING AND SHIPPING SHALL BE IN ACCORDANCE WITH MIL-P-116 SUB-METHOD IA-13

2▷ SPHERICITY REQUIREMENTS APPLY ONLY TO AREA INDICATED.





REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) B		UPGRADED FOR CLASS A RELEASE TDRR 00071		27 APR. 63	A.J.F. / WK
C		REVISED PER TDRR NO. 05054		16 DEC 63	12/17

00298
23 Jan 63

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.005	+ —
— —	-.005	— —

DO NOT SCALE THIS DRAWING

MATERIAL 1▷
J Smics 18 Jan 63
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C. LENZ DATE 11 DEC '62
CHECKED J Sayles 17 JAN 63
APPROVAL J. Hanna 18 JAN 63
APPROVAL A Kodel 18 JAN 63
NASA APPROVAL W J Rhine 1-23-63
R. Bras
MIT APPROVAL W Kupfer 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BALL - PRECISION

CODE IDENT NO.
SIZE C
1899967
SCALE FULL
SHEET

MIL 1077C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

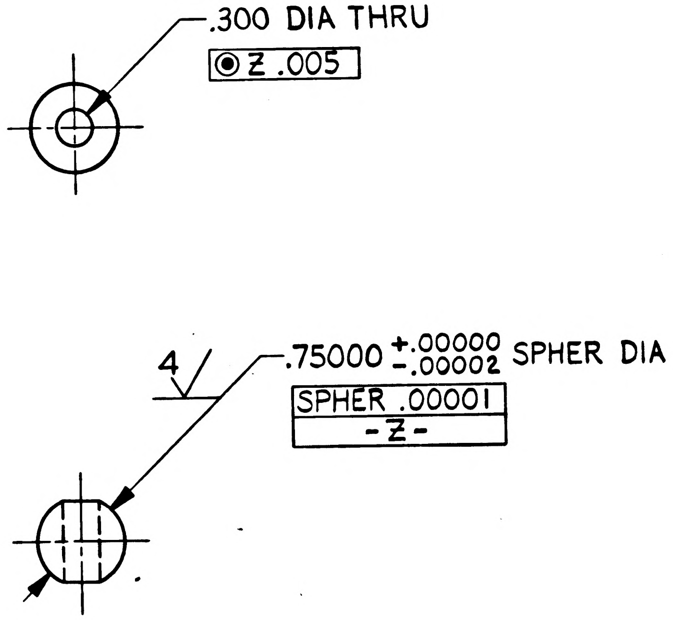
INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 440 C, COND A.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005-.015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED $125\sqrt{}$/AA.

MUST BE FREE FROM BURRS.

HEAT TREAT PER MIL-H-6875 TO R_C 58-60.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 **DATE** 23 Jan 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.005	+ —
— —	−.005	— —

DO NOT SCALE THIS DRAWING
MATERIAL 1
18 Jan 63
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C. LENZ DATE 11 DEC '62
CHECKED J Sayles 17 JAN 63
APPROVAL 18 JAN 63
APPROVAL 18 JAN 63
NASA APPROVAL W J -23-63
MIT APPROVAL 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BALL - PRECISION

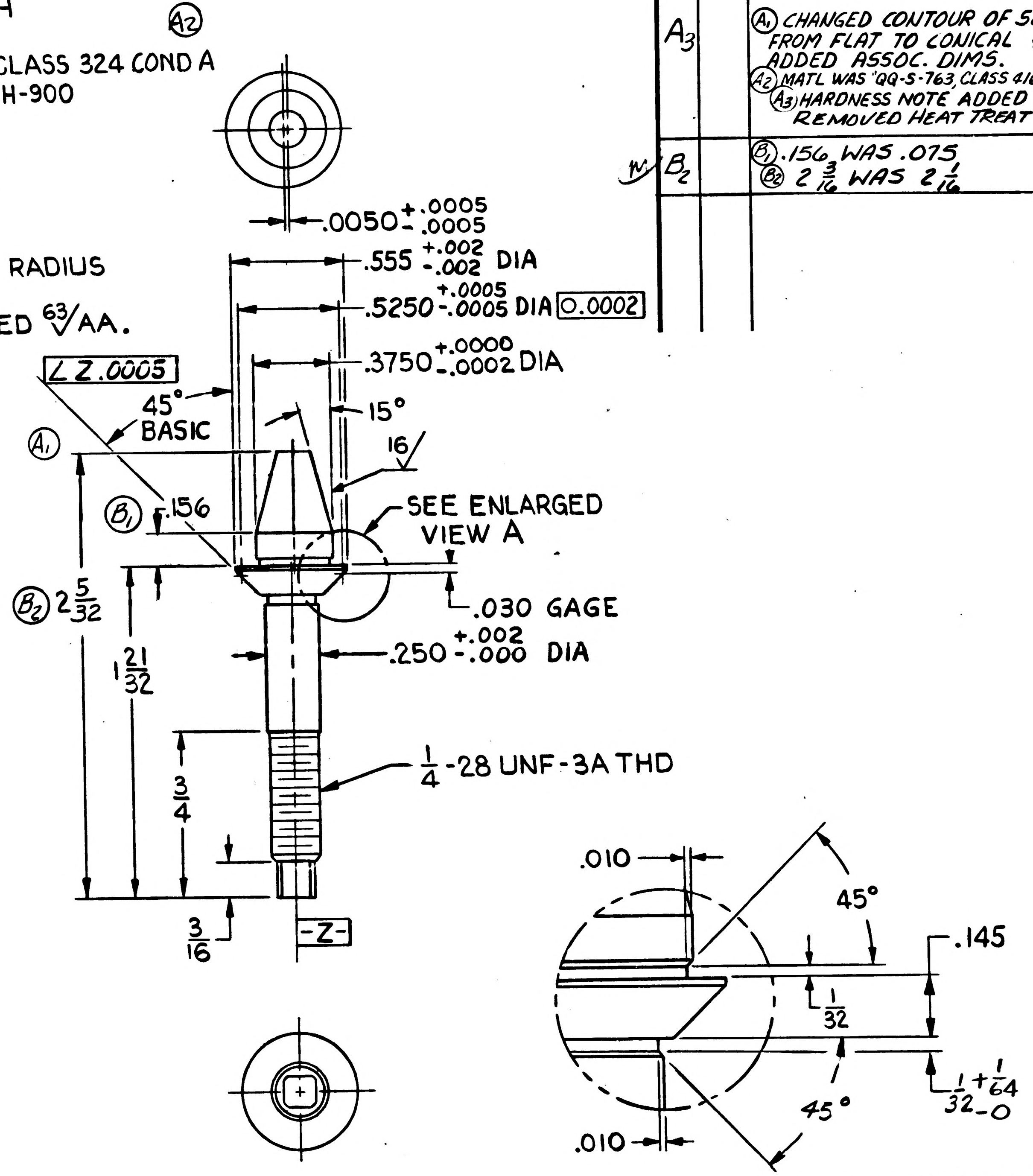
CODE IDENT NO.
SIZE C
1899967
SCALE FULL
SHEET

MIL 1077C—P

INTERPRET DRAWING IN ACCORDANCE WITH
MIL-D-70327.
MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324 COND A Ⓐ2
Ⓐ3 HARDEN PER MIL-H-6875 TYPE 17-4-PH, CONDITION H-900
TO Rc 40-45.
FINISH: PASSIVATE IN ACCORDANCE WITH
MIL-F-14072, (SIG C) FINISH E-300.

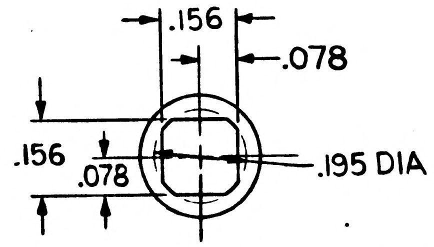
UNLESS OTHERWISE SPECIFIED:
ALL CORNERS MUST BE .005 TO .015 RADIUS
OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63/AA.
MUST BE FREE FROM BURRS.
PIECEMARK 1899968 PER MIL-STD-130.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A3		Ⓐ1 CHANGED CONTOUR OF SEAT FROM FLAT TO CONICAL & ADDED ASSOC. DIMS. Ⓐ2 MATL WAS "QQ-S-763, CLASS 416, COND A. Ⓐ3 HARDNESS NOTE ADDED REMOVED HEAT TREAT NOTE	DO 51263	7 JAN 63	L.S. WM
B2		Ⓑ1 .156 WAS .075 Ⓑ2 2 3/16 WAS 2 1/16	D.O. 51288	22-JAN-63	A.J.F.



.0050 +.0005 -.0005
.555 +.002 -.002 DIA
.5250 +.0005 -.0005 DIA
0.0002
.3750 +.0000 -.0002 DIA
∠ Z .0005
45° BASIC
15°
16
Ⓐ1
Ⓑ1 .156
SEE ENLARGED VIEW A
Ⓑ2 2 5/32
.030 GAGE
1 21/32
.250 +.002 -.000 DIA
1/4-28 UNF-3A THD
3/4
3/16
-Z-
.010
45°
.145
1/32
1/32 +1/64 -0
45°
.010

ENLARGED VIEW A
SCALE 4:1



.156
.078
.156
.078
.195 DIA

ENLARGED VIEW SHOWING
SQUARE END
SCALE 4:1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00298 **DATE** 23 JAN 63

–	–
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING

MATERIAL ▷ 1

J Somes 14 Dec 62
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 DEC 62
CHECKED J Sayles 14 DEC 62
APPROVAL J Hamm 14 Dec 62
APPROVAL A Hodel 14 DEC 62
NASA APPROVAL W J Rhine 1-23-63
MIT APPROVAL W A Ruffer 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PIN- ALIGNMENT

CODE IDENT NO.
SIZE C
1899968
SCALE 2:1
SHEET

MIL 1077C-P

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		UPGRADED FOR CLASS A RELEASE TDRR01070		27-APR-63	A.J.F. / WR

Ⓜ

INTERPRET DRAWING IN ACCORDANCE WITH
MIL-D-70327.

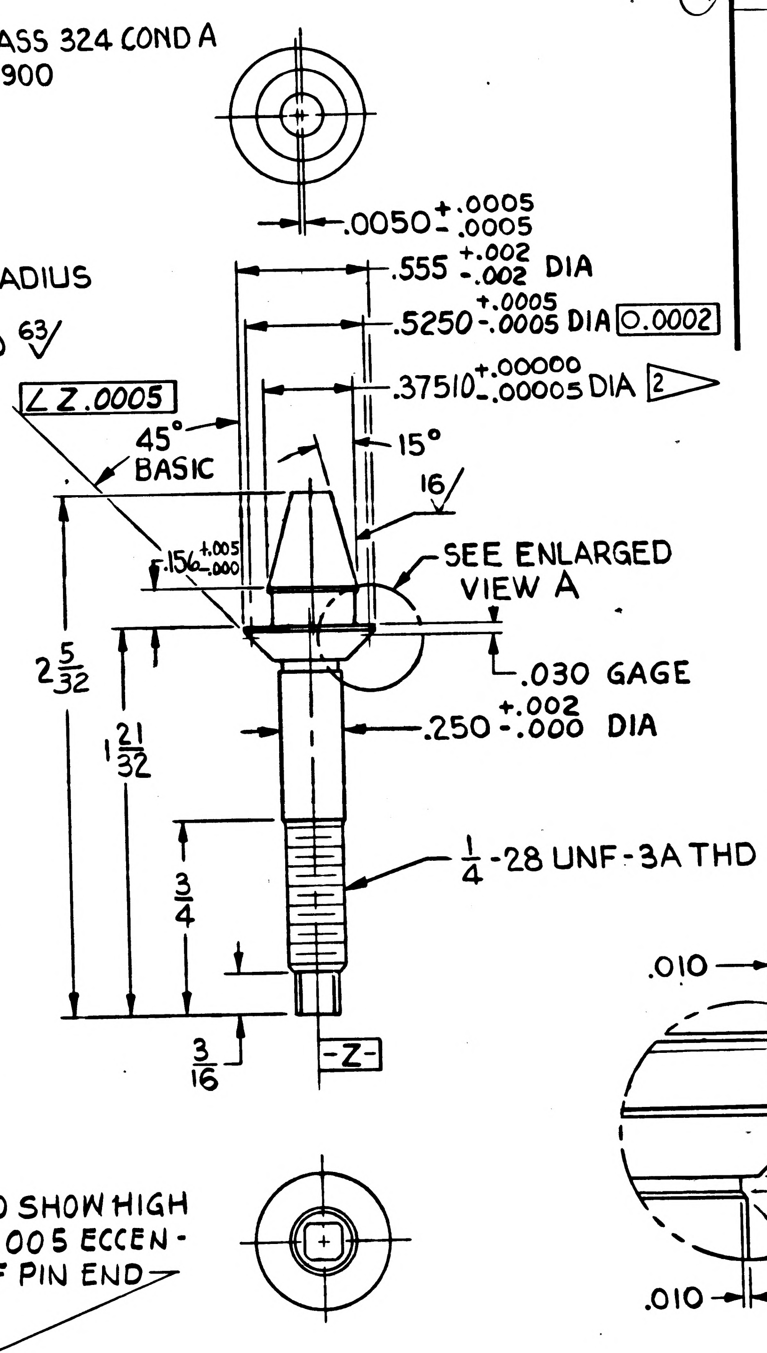
▷1 MATERIAL: STAINLESS STEEL PER QQ-S-763, CLASS 324 COND A
HARDEN PER MIL-H-6875 TYPE 17-4-PH, CONDITION H-900

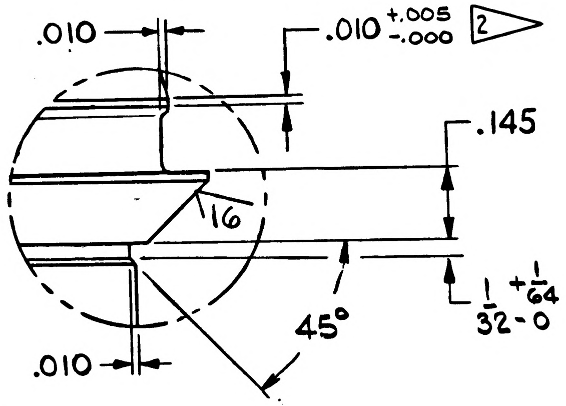
FINISH: PASSIVATE IN ACCORDANCE WITH
MIL-F-14072, (SIG C) FINISH E-300.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS MUST BE .005 TO .015 RADIUS
OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 63√
MUST BE FREE FROM BURRS.

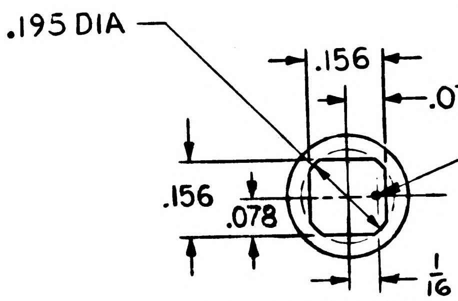
IDENTIFY USING DWG NO. AND REVISION
LETTER PER MIL-STD-130.

▷2 $.37510^{+.00000}_{-.00005}$ DIA MUST BE MAINTAINED
OVER $.010^{+.005}_{-.000}$ LENGTH.


.0050 +.0005 -.0005
.555 +.002 -.002 DIA
.5250 +.0005 -.0005 DIA ⊙0.0002
.37510 +.00000 -.00005 DIA ▷2
∠ Z .0005
45° BASIC
15°
16
.156 +.005 -.000
SEE ENLARGED VIEW A
.030 GAGE
.250 +.002 -.000 DIA
2 5/32
1 21/32
3/4
1/4-28 UNF-3A THD
3/16
-Z-
PUNCH TO SHOW HIGH POINT OF .005 ECCENTRICITY OF PIN END


.010
.010 +.005 -.000 ▷2
.145
16
45°
1/32 +1/64 -0
.010

ENLARGED VIEW A
SCALE 4:1


.195 DIA
.156
.078
.156
.078
1/16

ENLARGED VIEW SHOWING
SQUARE END
SCALE 4:1

00298

23 JAN 63

1899966	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL ▷1
J. Sames 14 Dec 62
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 12 DEC 62
CHECKED J. Sayles 14 DEC 62
APPROVAL J. Hann 14 Dec '62
APPROVAL S. Kodel 14 DEC 62
NASA APPROVAL W. J. Rhine 1-23-63
R. Bean
MIT APPROVAL W. Ruffin 23 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PIN- ALIGNMENT

CODE IDENT NO.
SIZE C
1899968
SCALE 2:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 1077C-P

ↄ 6966681

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		UPGRADED FOR CLASS A RELEASE	—	63	

NOTES:

ISOLATOR CHARACTERISTICS:

ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

EFFECTIVE 1G LOAD PER ISOLATOR - 46 LBS.

DESIGN REQUIREMENTS:

DRIFT: (AFTER INITIAL DEFLECTION)
LESS THAN $\frac{1}{32}$ IN UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS
RADIAL - 4000 LBS

PEEL STRENGTH - AXIAL SNUBBER BOND SHALL NOT PEEL WITH A 3/8 INCH AXIAL DEFLECTION CONCURRENT WITH THE APPLICATION OF A 400 LB RADIAL LOAD ON FIND #3

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL
50±5 DUROMETER.

ISOLATOR MATERIAL
THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCES WITH OBJECTIONABLE ODOR.

ENVIRONMENTAL REQUIREMENTS

THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:

TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.

PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ± 5%

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS

LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION $\frac{1}{8}$ IN. FROM THE ZERO LOAD ℄.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT EXCEED THE DETAIL ENVELOPE.

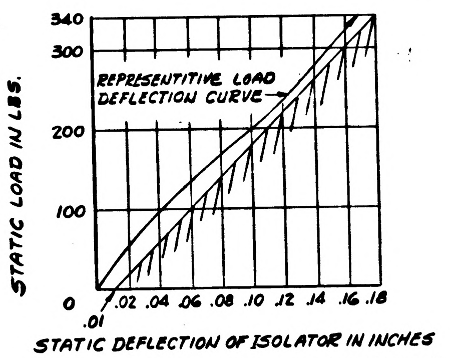
1▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

2▷ QQ-S-763 CLASS 302, COND A, STAINLESS STEEL

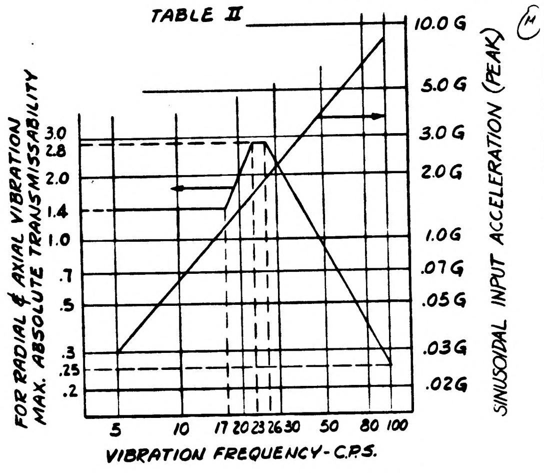
3▷ MIL-F-14072 (SIG C) FIN E-300 (PASSIVATE)

TABLE I

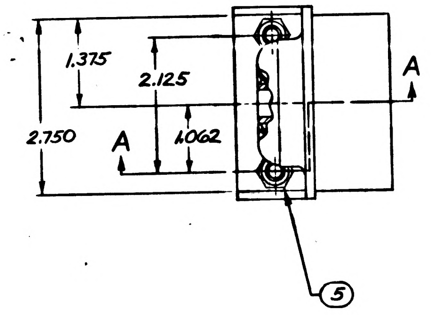
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

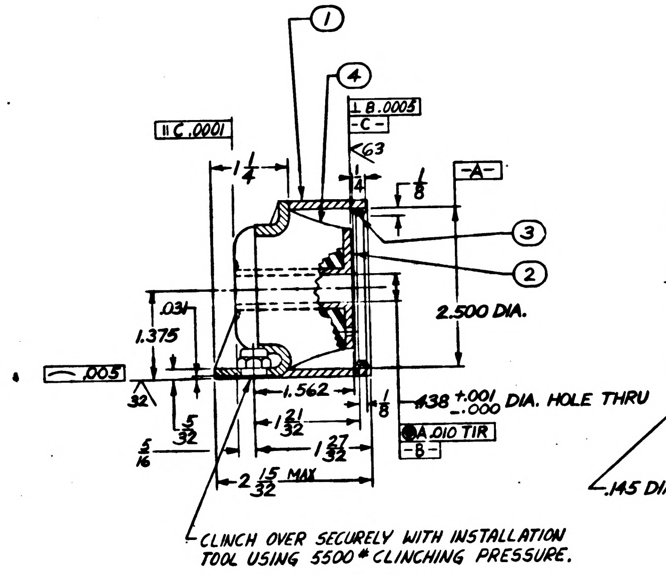


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD



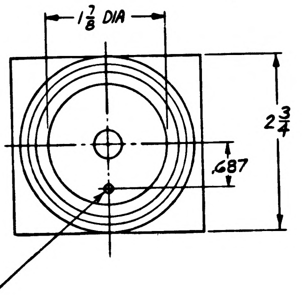
ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



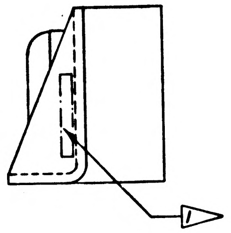


CLINCH OVER SECURELY WITH INSTALLATION TOOL USING 5500# CLINCHING PRESSURE.

SECTION A-A



.145 DIA. HOLE THRU ITEM 2



ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
5	2	1010404 - 019	NUT-CLINCH, SELF LOCKING
4	1	1899969 - 4	ISOLATOR
3	1	1899969 - 3	SNUBBER
2	1	1899969 - 2	BUSHING 2▷ 3▷
1	1	1899969 - 1	ISOLATOR HOUSING 2▷ 3▷

LIST OF PARTS AND MATERIALS

C 1899969

0055-

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± $\frac{1}{64}$ DECIMALS ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL 2▷
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 18 FEB 63
MALIKOWSKI 5 MAR 63
CHECKED
APPROVAL J. HANN 5 MAR 63
A. J. RODEL 5 MAR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO
SIZE E
1899969
SCALE 1/1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

ISOLATOR CHARACTERISTICS:

ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

EFFECTIVE 1G LOAD PER ISOLATOR - 46 LBS.

DESIGN REQUIREMENTS:

DRIFT: (AFTER INITIAL DEFLECTION)
LESS THAN 1/32 IN UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

RADIAL - 78 G's, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE

PEEL STRENGTH - AXIAL SNUBBER BOND SHALL NOT PEEL WITH A 3/8 INCH AXIAL DEFLECTION CONCURRENT WITH THE APPLICATION OF A 400 LB RADIAL LOAD ON FIND #3

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL
50±5 DUROMETER.

ISOLATOR MATERIAL
THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCES WITH OBJECTIONABLE ODOR.

ENVIRONMENTAL REQUIREMENTS

THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:

TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.

PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ± 5%

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS

LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION 1/8 IN. FROM THE ZERO LOAD ℄.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT EXCEED THE DETAIL ENVELOPE.

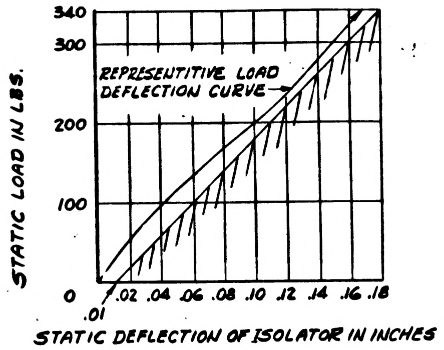
1▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

2▷ QQ-S-763 CLASS 302, COND A, STAINLESS STEEL

3▷ MIL-F-14072 (SIG C) FIN E-300 (PASSIVATE)

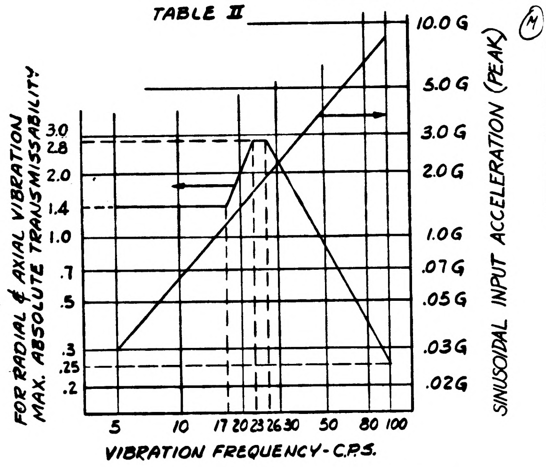
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

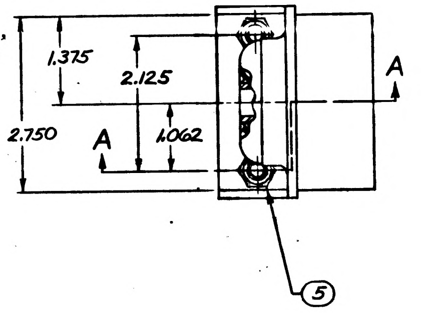
TABLE II

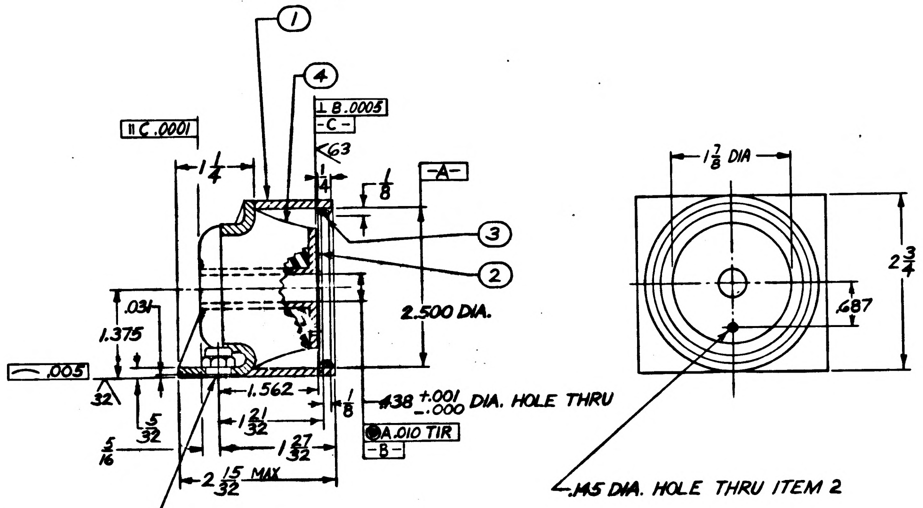


ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)

C 6966681

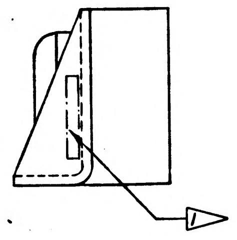
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS "A" RELEASE TDRR [illegible]	—	[illegible] APR 63	
D		REVISED IN ACCORDANCE WITH TDRR 01971			





CLINCH OVER SECURELY WITH INSTALLATION TOOL USING 5500 # CLINCHING PRESSURE.

SECTION A-A



ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
5	2	1010404 - 019	NUT-CLINCH, SELF LOCKING
4	1	1899969 - 4	ISOLATOR
3	1	1899969 - 3	SNUBBER
2	1	1899969 - 2	BUSHING 2▷ 3▷
1	1	1899969 - 1	ISOLATOR HOUSING 2▷ 3▷

LIST OF PARTS AND MATERIALS

1899969 C

C0554

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS +.005 -.005 ANGLES + — - —
DO NOT SCALE THIS DRAWING
MATERIAL 2▷
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P.E. Jones DATE 18 FEB 63
MALIKOWSKI 5 MAR 63
CHECKED
APPROVAL J. Hanna 5 MAR 63
A.J. RODEL 5 MAR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL 13 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REAR (INSEPARABLE) ASSEMBLY

CODE IDENT NO.
SIZE E
1899969
SCALE 1/1
SHEET

3 6966681

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UPGRADED FOR CLASS "A" RELEASE	—	2 APR 63	WF
D		REVISED IN ACCORDANCE WITH TDRR 01971			23 WK
E		REPLACED BY REV F WITH CHANGE TDRR 02829		28 AUG 63	

NOTES:

ISOLATOR CHARACTERISTICS:
ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

EFFECTIVE 1G LOAD PER ISOLATOR - 46 LBS.

DESIGN REQUIREMENTS:
DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN $\frac{1}{32}$ IN UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.
RADIAL - 78 G's, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE

PEEL STRENGTH - AXIAL SNUBBER BOND SHALL NOT PEEL WITH A 3/8 INCH AXIAL DEFLECTION CONCURRENT WITH THE APPLICATION OF A 400 LB RADIAL LOAD ON FIND #3

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL
50±5 DUROMETER.

ISOLATOR MATERIAL
THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCES WITH OBJECTIONABLE ODOR.

ENVIRONMENTAL REQUIREMENTS
THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.
PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.
HUMIDITY - 95% ± 5%
FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).
SHELF LIFE - 3 YEARS
LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION $\frac{1}{8}$ IN. FROM THE ZERO LOAD ℄.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT EXCEED THE DETAIL ENVELOPE.

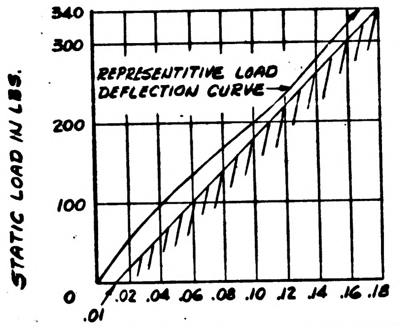
1▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

2▷ QQ-S-763 CLASS 302, COND A, STAINLESS STEEL

3▷ MIL-F-14072 (SIG C) FIN E-300 (PASSIVATE)

TABLE I

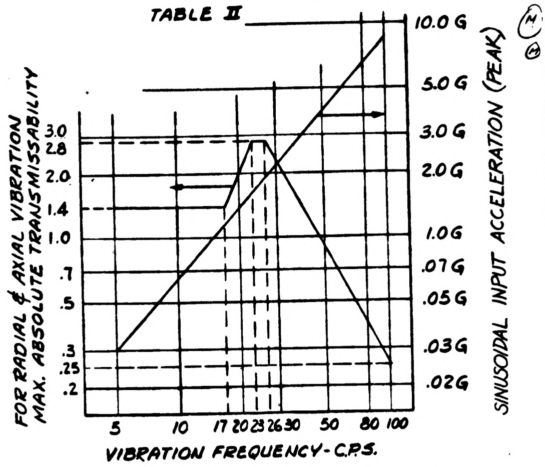
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



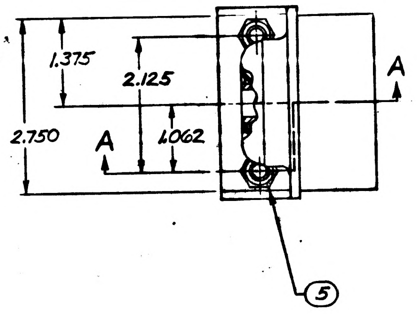
STATIC DEFLECTION OF ISOLATOR IN INCHES

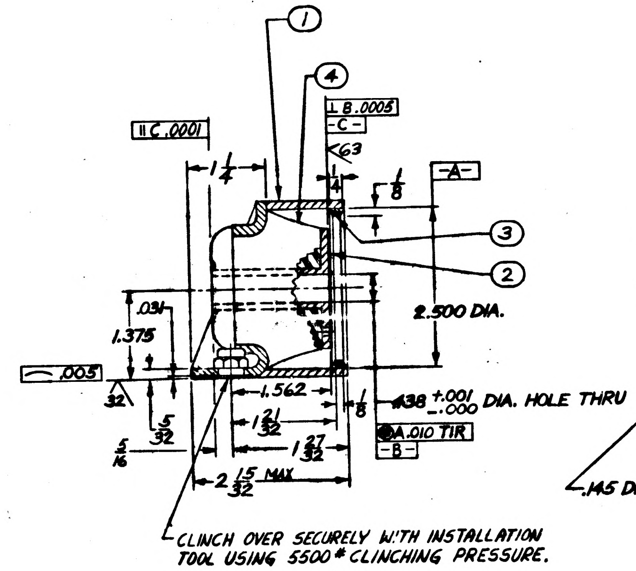
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



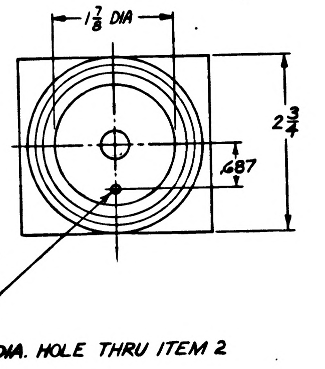
ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



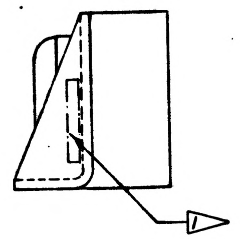


CLINCH OVER SECURELY WITH INSTALLATION TOOL USING 5500# CLINCHING PRESSURE.

SECTION A-A



Ⓔ REPLACED BY REV. F WITH CHANGE



ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION		
5	2	1010404-019	NUT-CLINCH, SELF LOCKING		
4	1	1899969-4	ISOLATOR		
3	1	1899969-3	SNUBBER		
2	1	1899969-2	BUSHING	2▷	3▷
1	1	1899969-1	ISOLATOR HOUSING	2▷	3▷

LIST OF PARTS AND MATERIALS

1899969

co55-

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64
DECIMALS +.005 -.005
ANGLES + - - -
DO NOT SCALE THIS DRAWING
MATERIAL 2▷
CONTRACT NAS 9-487

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 18 FEB 63
MALIKOWSKI 5 MAR 63
CHECKED
APPROVAL J. HANW 5 MAR 63
A. J. KODEL 5 MAR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REFR (INSEPARABLE) ASSEMBLY

CODE IDENT NO.
SIZE E
1899969
SCALE 1/1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER MIL-STD-130 (ES-267).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

4. ISOLATOR CHARACTERISTICS:
ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.

5. DESIGN REQUIREMENTS:
DRIFT: (AFTER INITIAL DEFLECTION)
LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .37 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

6. ENVIRONMENTAL REQUIREMENTS:
THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95 % ± 5 %.

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS.

LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION .12 IN. FROM THE ZERO LOAD ℄.

7. MATERIAL: ISOLATOR HOUSING - CAST PER USING 220 T4 ALUM. ALLOY PER QQ-A-601.
SNUBBER RING - 50 ± 5 DUROMETER.

INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

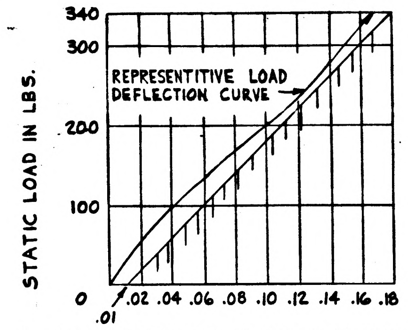
CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES-591).
CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

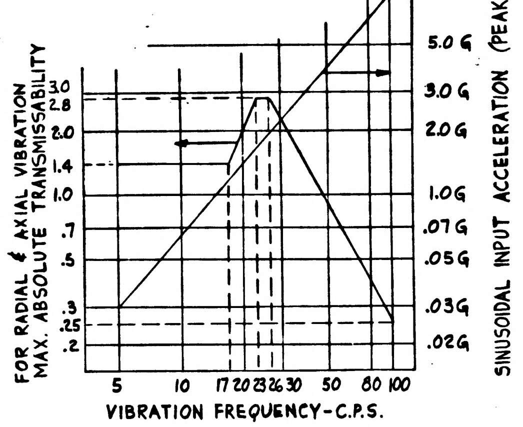
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



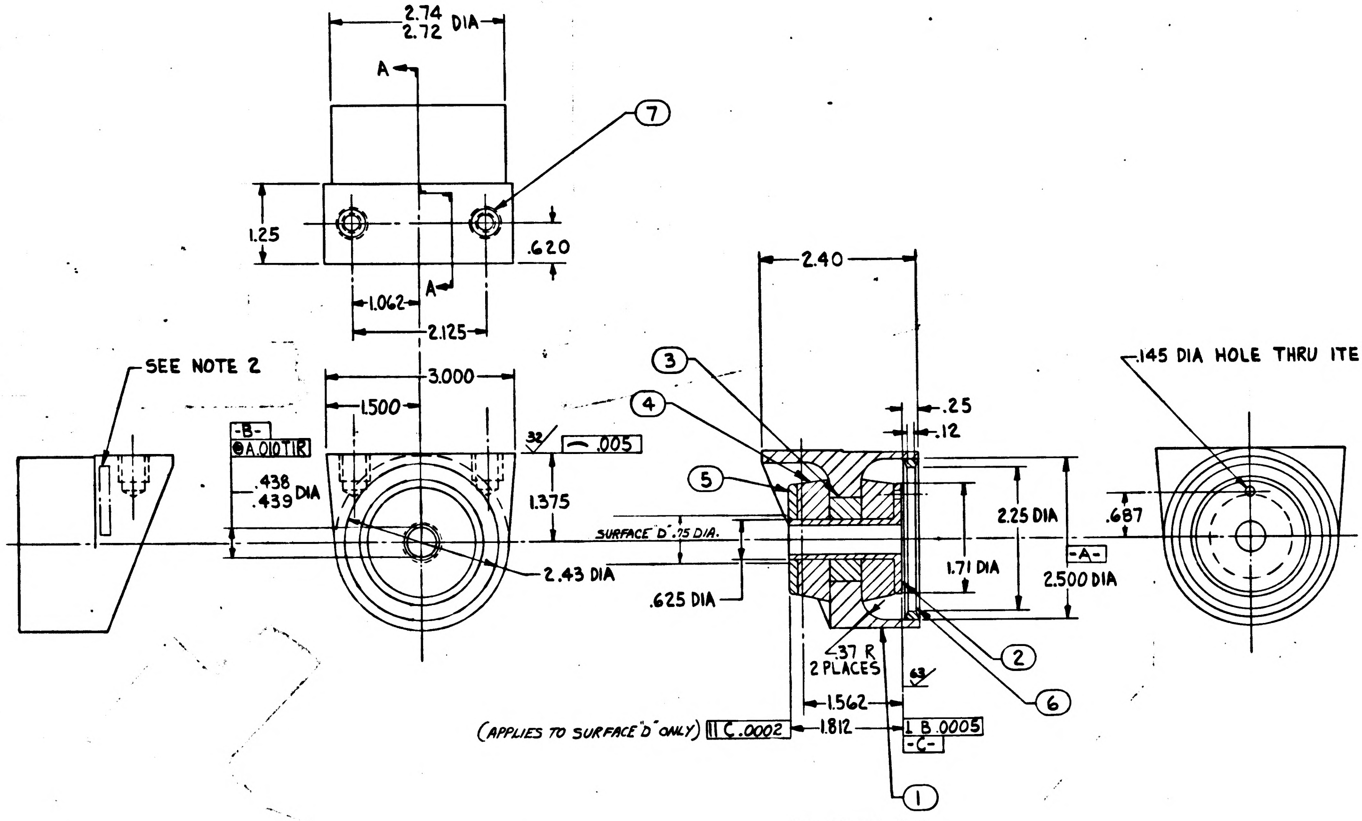
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REVISED AND REDRAWN DRR 22829		8/28/63	K.E.



Ⓕ REPLACES REV. E WITH CHANGES

7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899969 -6	RING, SNUBBER
5	1	1899969 -5	WASHER
4	2	1899969 -4	INSERT, RESILIENT
3	1	1899969 -3	INSERT, RESILIENT
2	1	1899969 -2	CORE
1	1	1899969 -1	ISOLATOR, HOUSING
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	± .02	+ 1°
- —	± .005	- 1°

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 7

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN J. Korasin DATE 13 AUG 63
CHECKED Ogawa 19 AUG 63
APPROVAL Lietz 19 AUG 63
APPROVAL R. Koeppen 19 AUG 63
NASA APPROVAL 9/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899969
SCALE 1:1
SHEET 1 OF 1

1899969 F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
=		REVISED AND REDRAWN TDRR 02839		8/28/63	[illegible]
G		REVISED PER TDRR NO.03675		21 OCT. 63	[illegible]

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER [illegible] 002023 (ES-267).
3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.
4. ISOLATOR CHARACTERISTICS:
   ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
   EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.
5. DESIGN REQUIREMENTS:
   DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

   SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

   RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .37 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.
6. ENVIRONMENTAL REQUIREMENTS:
   THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
   TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

   PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
   1×10^{-4} MM HG FOR 100 HOURS.
   TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

   HUMIDITY - 95 % ± 5 %.

   FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

   SHELF LIFE - 3 YEARS.

   LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION .12 IN. FROM THE ZERO LOAD ℄.
7. MATERIAL: ISOLATOR HOUSING - CAST PER USING 220 T4 ALUM. ALLOY PER QQ-A-601.

   SNUBBER RING - 50 ± 5 DUROMETER.

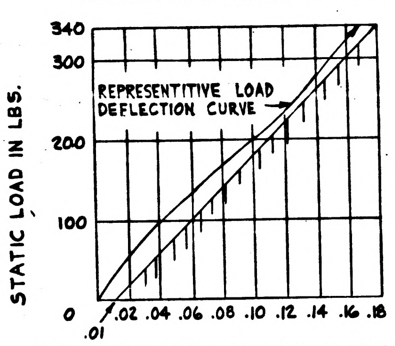
   INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

   CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

   WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).
8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES-591).
   CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

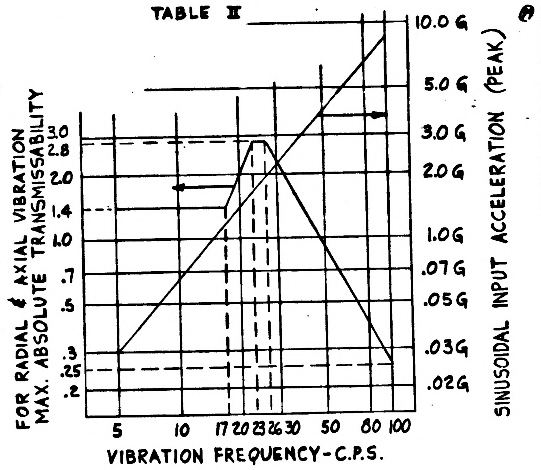
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

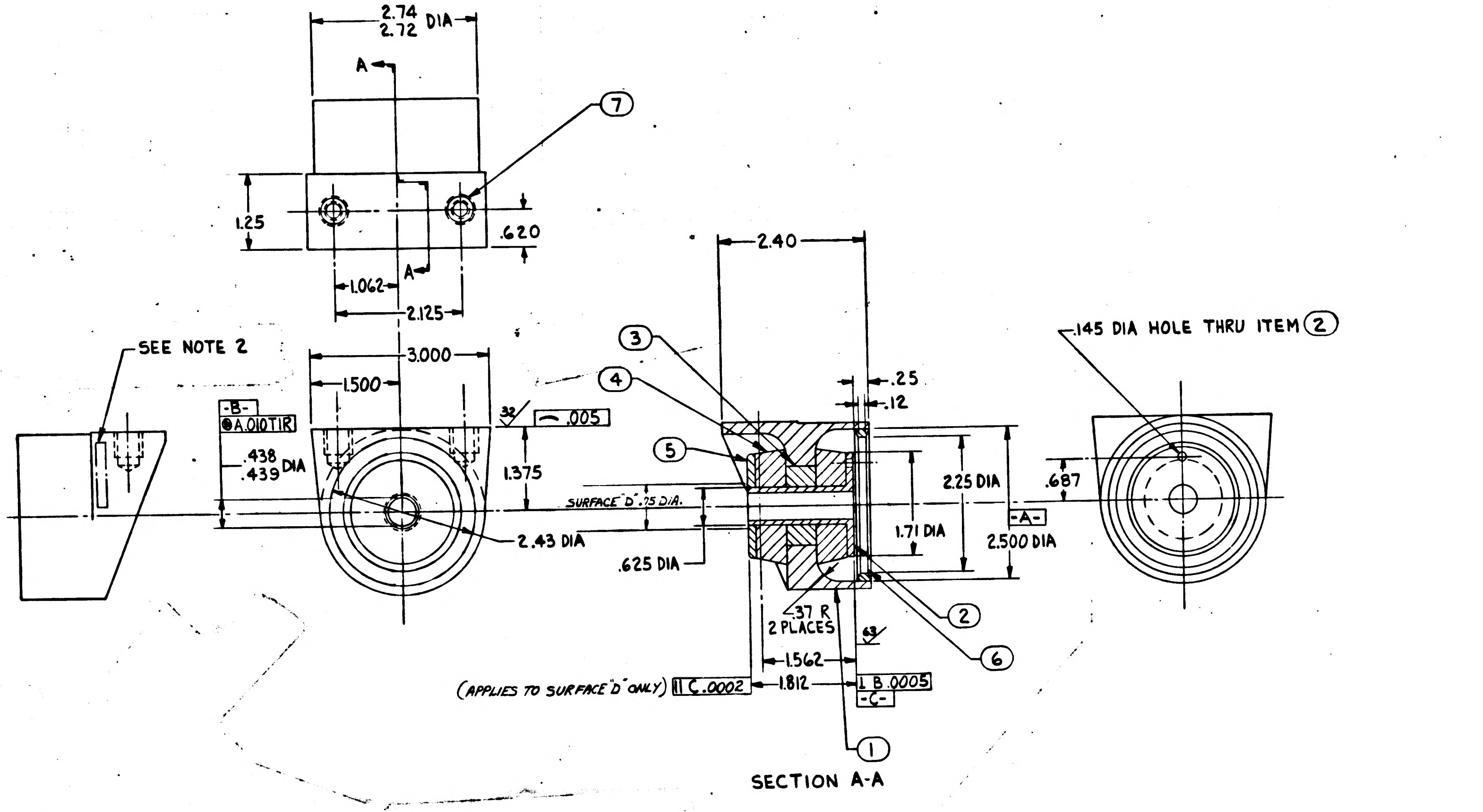


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

Ⓕ REPLACES REV. E WITH CHANGES

ITEM NO	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899969 -6	RING, SNUBBER
5	1	1899969 -5	WASHER
4	2	1899969 -4	INSERT, RESILIENT
3	1	1899969 -3	INSERT, RESILIENT
2	1	899969 -2	CORE
1	1	1899969 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS ±.02 ±.005
ANGLES +1° −1°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 7
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Koracin DATE 13 AUG 63
CHECKED Ogawa 19 AUG 63
APPROVAL LIETZ 19 AUG 63
APPROVAL [illegible] 19 AUG 63
NASA APPROVAL [illegible] 9/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899969
SCALE 1:1
SHEET 1 OF 1

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER [illegible] LETTER SERIAL NO. & CURE DATE PER MIL-STD-130 (ES-807).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE METAL ENVELOPE.

4. ISOLATOR CHARACTERISTICS:
   ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
   EFFECTIVE 1G LOAD PER ISOLATOR = 46 LBS.

5. DESIGN REQUIREMENTS:
   DRIFT (AFTER INITIAL DEFLECTION)
   LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

   SHOCK LOADS RADIAL AND AXIAL DIRECTION.
   75 G'S, 11 MILLI SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

   RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .37 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .030 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

6. ENVIRONMENTAL REQUIREMENTS
   THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS.
   TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

   PRESSURE - 5 PSIA (100 % O₂) FOR 400 HOURS
   [illegible]
   TEST PER MIL-STD 810, METHOD 500 PROCEDURE II AT 70°F.

   HUMIDITY - 95 % ± 5 %.

   FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (1 ALTERNATE).

   SHELF LIFE - 5 YEARS.

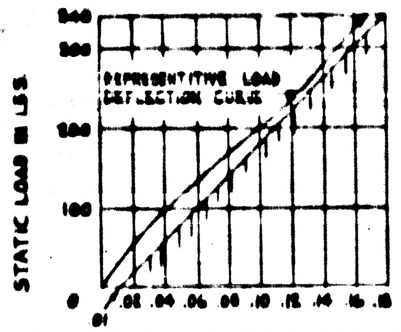
   LIFE - EQUIVALENT TO 4 X 10⁶ CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION .12 IN. FROM THE ZERO LOAD ℄.

7. MATERIAL: ISOLATOR HOUSING - CAST PER [illegible] USING 220 T4 ALUM ALLOY PER QQ-A-601.
   SNUBBER RING - 50 ± 5 DUROMETER.
   INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.
   CAPS QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-360).
   WASHER QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-360).

8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES 591)
   CAPS & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES 588 PASSIVATE).

TABLE I

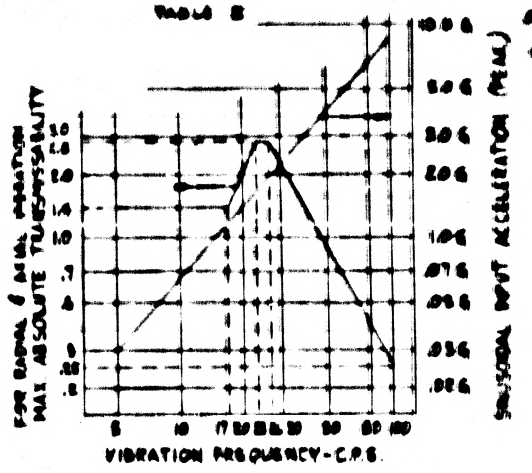
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



STATIC DEFLECTION OF ISOLATOR IN INCHES

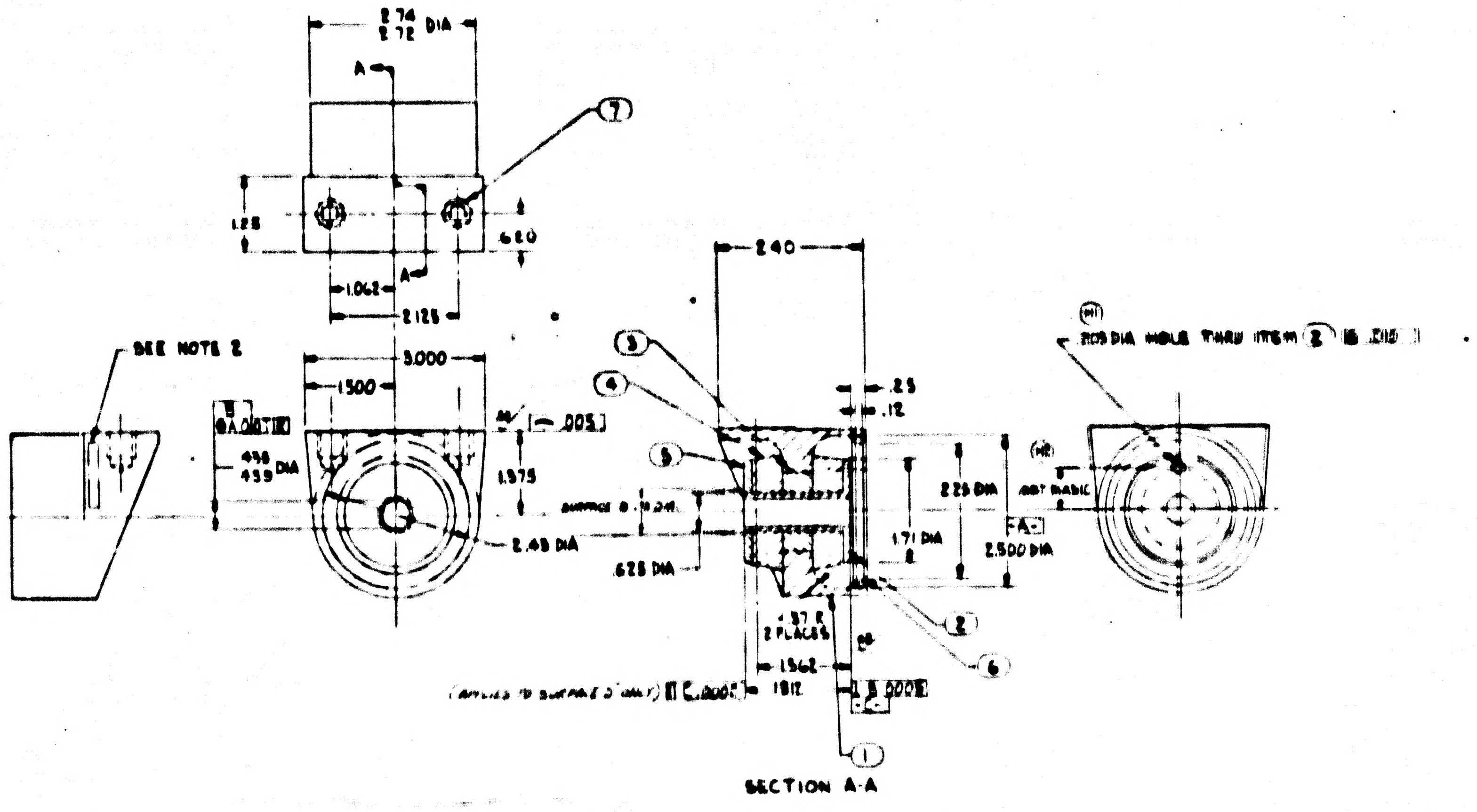
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



VIBRATION FREQUENCY - C.P.S.

ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR 46 LBS)



SECTION A-A

① [illegible]

7	2	NAS 1395 C 8L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	[illegible] -6	RING, SNUBBER
5	1	[illegible] -5	WASHER
4	2	[illegible] -4	INSERT, RESILIENT
3	1	[illegible] -3	INSERT, RESILIENT
2	1	[illegible] -2	CAPS
1	1	[illegible]	ISOLATOR HOUSING
ITEM NO.	NO. REQD	[illegible]	[illegible]

MOUNT, RESILIENT [illegible]
(INSERT AND [illegible])
ASSEMBLY

SEE NOTE 7

11A9[illegible]

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER ND1002023 (ES-267).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

4. ISOLATOR CHARACTERISTICS:
ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.

5. DESIGN REQUIREMENTS:
DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .32 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

6. ENVIRONMENTAL REQUIREMENTS:
THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95 % ± 5 %.

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS.

LIFE - EQUIVALENT TO 30 MINUTES RESONANCE ENDURANCE UNDER 3G PEAK SINUSOIDAL INPUT ALONG EACH AXIS. A 7G SUSTAINED ACCELERATION SHALL BE APPLIED PARALLEL TO THE AXIS OF EXCITATION. (J2)

7. MATERIAL: ISOLATOR HOUSING - CAST USING 220 T4 ALUM. ALLOY PER QQ-A-601.
SNUBBER RING - 50 ± 5 DUROMETER.
INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.
CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).
WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

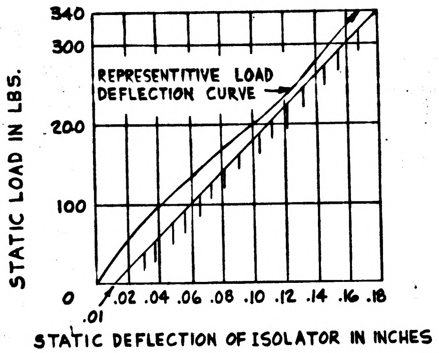
8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES-591).
CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

9. BOND STRENGTH ITEM NO.6 (RING, SNUBBER) TO ITEM NO.1 (ISOLATOR HOUSING) SNUBBER SHOULD NOT PEEL OFF UNDER A 3/8 INCH AXIAL DEFLECTION CONCURRENT WITH THE APPLICATION OF A 400 LB. LOAD ON THE SNUBBER ELEMENT WITH EQUIVALENT OF SNUBBER BRACKET IN PLACE.

10. ALTERNATE FABRICATION AND ASSEMBLY OF MOUNT, RESILIENT, REAR (INSEPARABLE) ASSEMBLY.

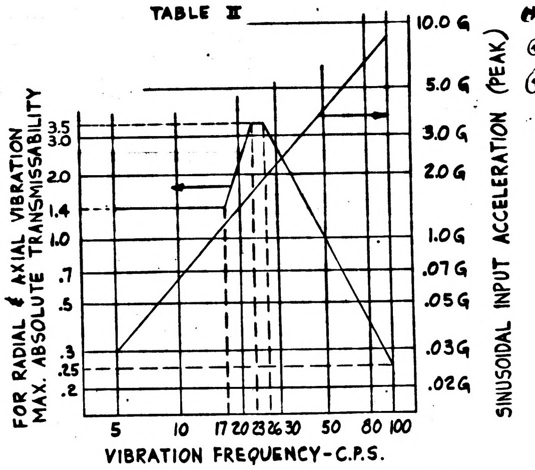
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



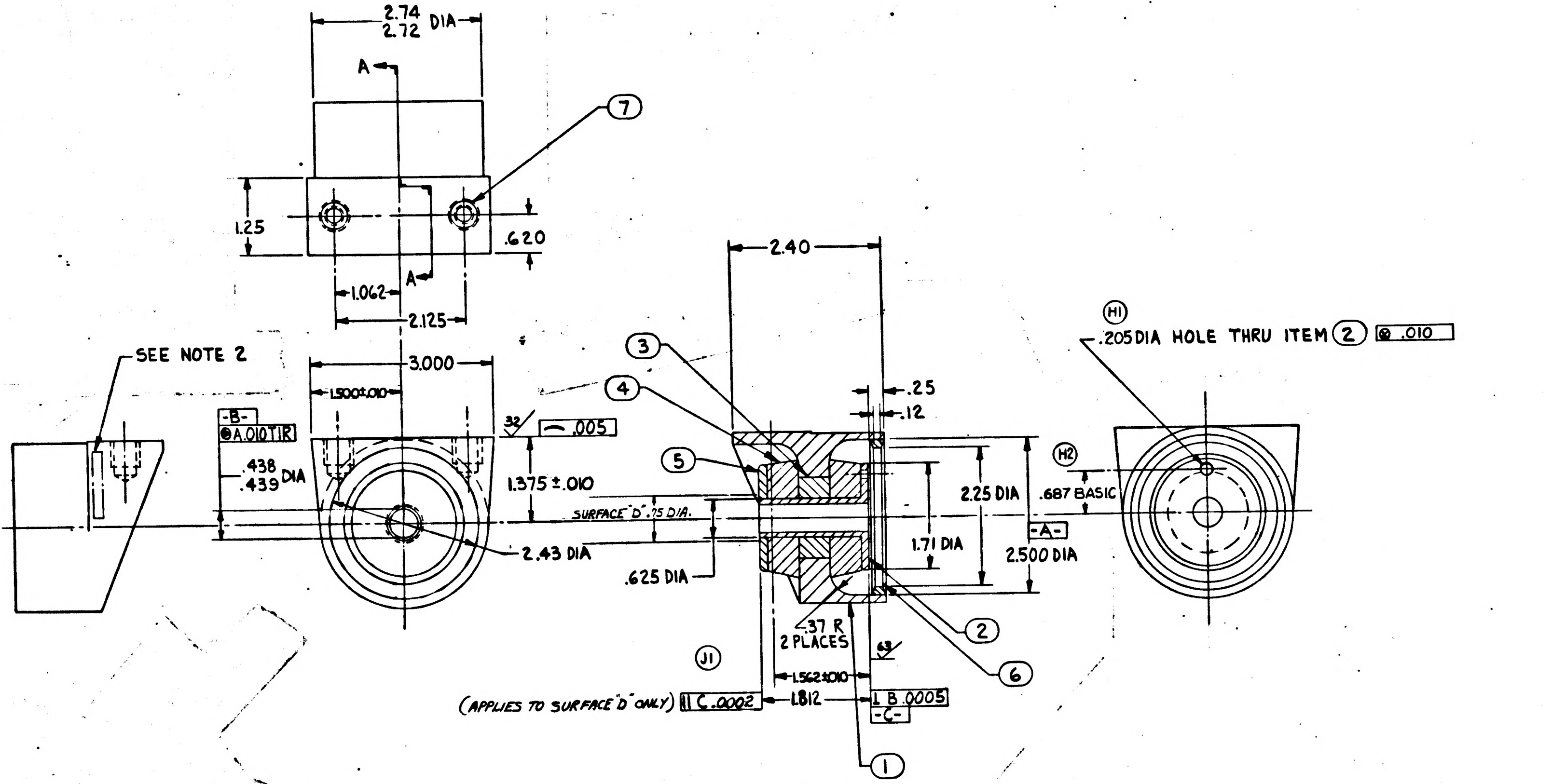
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II

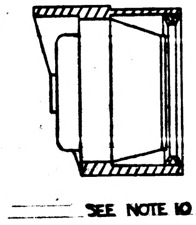


ISOLATOR DYNAMIC CHARACTERISTICS
(EFFECTIVE LOAD PER ISOLATOR: 46 LBS)

(J3)



SECTION A-A



SEE NOTE 10

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
F		REVISED AND REDRAWN TDRR 02839		8/28/63	
G		REVISED PER TDRR NO. 03675		21 OCT. 63	WK
H_2		REVISED PER TDRR NO. 04083.		31 OCT. 63	WK
J_3		REVISED PER TDRR NO. 04619		20 NOV. 63	WK

(F) REPLACES REV. E WITH CHANGES

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899969 -6	RING, SNUBBER
5	1	1899969 -5	WASHER
4	2	1899969 -4	INSERT, RESILIENT
3	1	1899969 -3	INSERT, RESILIENT
2	1	1899969 -2	CORE
1	1	1899969 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — —
DECIMALS ± .02 ± .005
ANGLES + 1° − 1°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 7
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Korasin DATE 13 AUG 63
CHECKED Ogawa 19 AUG 63
APPROVAL LIETZ 19 AUG 63
APPROVAL 19 AUG 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899969
SCALE 1:1
SHEET 1 OF 1

1899969 J

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER ND1002023 (ES-267).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

4. ISOLATOR CHARACTERISTICS:
ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.

5. DESIGN REQUIREMENTS:
DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .32 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

6. ENVIRONMENTAL REQUIREMENTS:
THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95 % ± 5 %.

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS.

LIFE - EQUIVALENT TO 30 MINUTES RESONANCE ENDURANCE UNDER 3G PEAK SINUSOIDAL INPUT ALONG EACH AXIS. A 3G SUSTAINED ACCELERATION SHALL BE APPLIED PARALLEL TO THE AXIS OF EXCITATION. (J2)

7. MATERIAL: ISOLATOR HOUSING - CAST USING 220 T4 ALUM. ALLOY PER QQ-A-601.
SNUBBER RING - 50 ± 5 DUROMETER.

INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

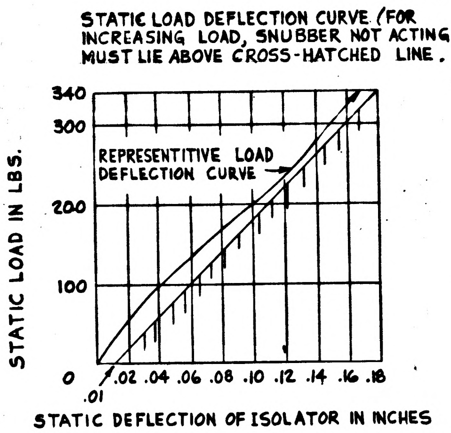
WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES-591).
CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

9. BOND STRENGTH ITEM NO. 6 (RING, SNUBBER) TO ITEM NO. 1 (ISOLATOR HOUSING) SNUBBER SHOULD NOT PEEL OFF UNDER A 3/8 INCH AXIAL DEFLECTION CONCURRENT WITH THE APPLICATION OF A 400 LB. LOAD ON THE SNUBBER ELEMENT WITH EQUIVALENT OF SNUBBER BRACKET IN PLACE.

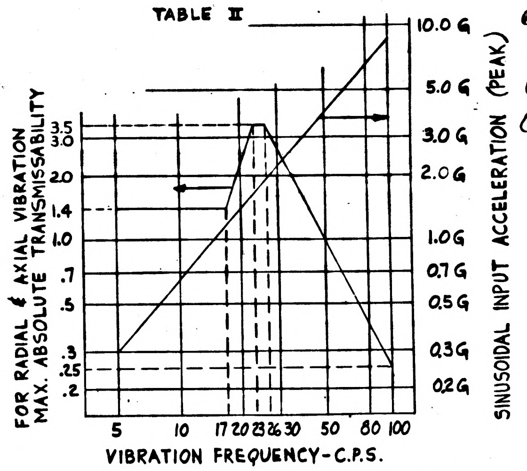
10. ALTERNATE FABRICATION AND ASSEMBLY OF MOUNT, RESILIENT, REAR (INSEPARABLE) ASSEMBLY.

TABLE I



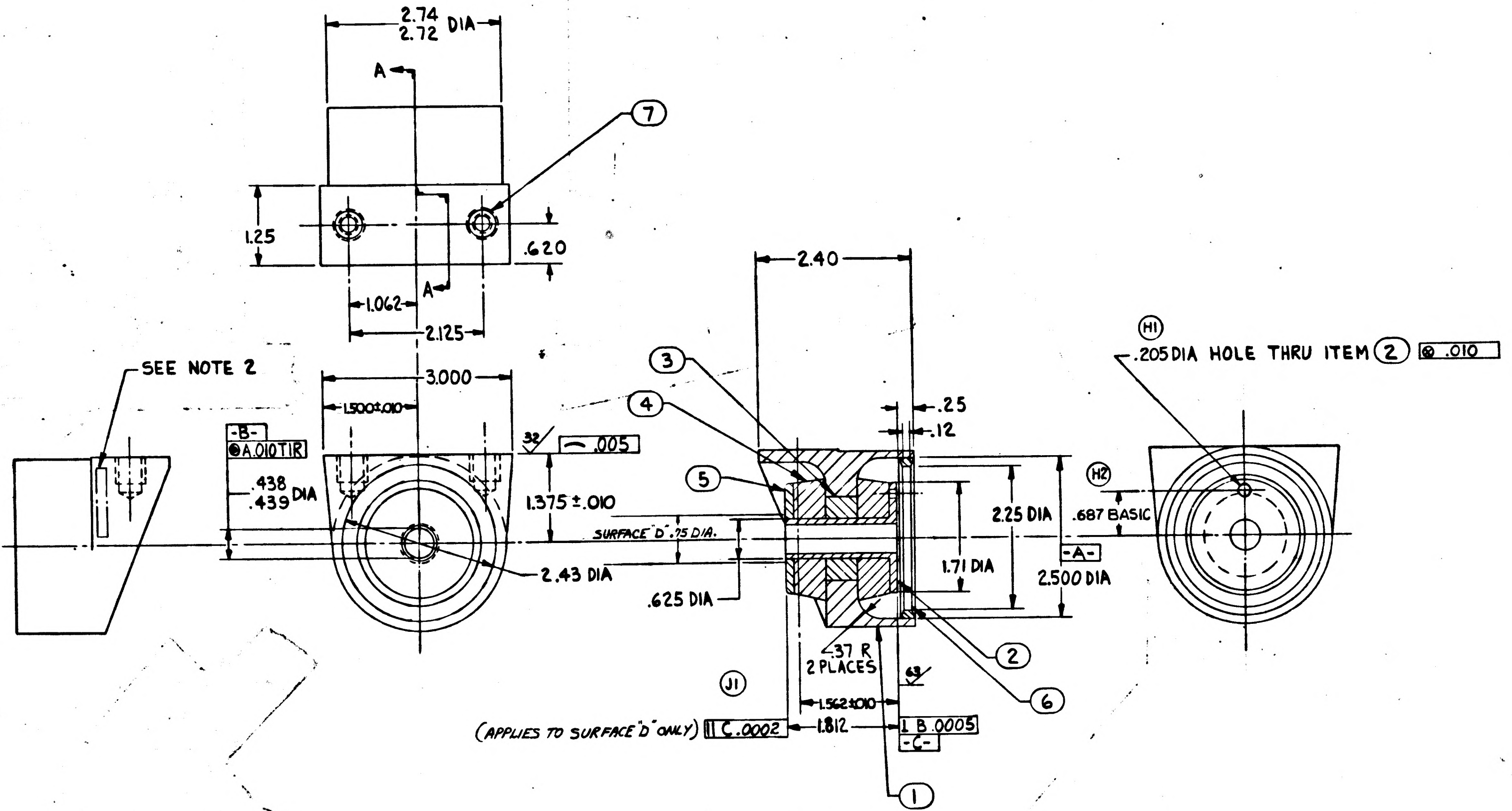
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II

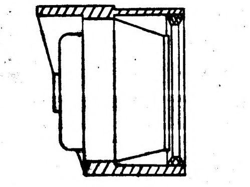


ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)

(J3)



SECTION A-A



SEE NOTE 10

(F) REPLACES REV. E WITH CHANGES

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
F		REVISED AND REDRAWN TDRR 02829		8/28/63	K. E. G.
G		REVISED PER TDRR NO. 03675		21 OCT. 63	WK
H2		REVISED PER TDRR NO. 04083.		31 OCT. 63	LLK
J3		REVISED PER TDRR NO. 04619		20 NOV. 63	WK
K2		REVISED PER TDRR NO. 04950.		DEC. 63	

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899969 -6	RING, SNUBBER
5	1	1899969 -5	WASHER
4	2	1899969 -4	INSERT, RESILIENT
3	1	1899969 -3	INSERT, RESILIENT
2	1	1899969 -2	CORE
1	1	1899969 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

APPLICATION	
NEXT ASSY	USED ON
1899950-011	1899950-011

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS ±.02 ±.005
ANGLES +1° −1°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 7
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Korasin DATE 13 AUG 63
CHECKED Ogawa 19 AUG 63
APPROVAL Lietz 19 AUG 63
APPROVAL 19 AUG 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO
SIZE E
1899969
SCALE 1:1
SHEET 1 OF 1

1899969 K

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER ND1002023 (ES-267).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

4. ISOLATOR CHARACTERISTICS:
ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
EFFECTIVE 1G LOAD PER ISOLATOR - 46 LBS.

5. DESIGN REQUIREMENTS:
DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS: RADIAL AND AXIAL DIRECTION. 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .32 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

6. ENVIRONMENTAL REQUIREMENTS:
THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ± 5%.

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS.

LIFE - EQUIVALENT TO 30 MINUTES RESONANCE ENDURANCE UNDER 3G PEAK SINUSOIDAL INPUT ALONG EACH AXIS. A 3G SUSTAINED ACCELERATION SHALL BE APPLIED PARALLEL TO THE AXIS OF EXCITATION. (J2)

7. MATERIAL: ISOLATOR HOUSING - CAST USING 220 T4 ALUM. ALLOY PER QQ-A-601.

SNUBBER RING - 50 ± 5 DUROMETER.

INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES-591).
CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

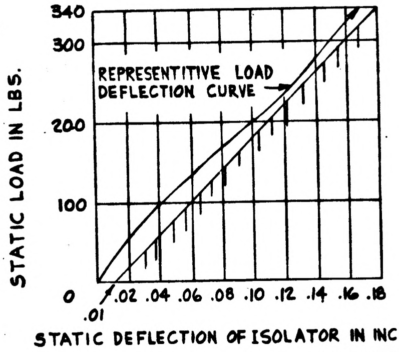
9. BOND STRENGTH ITEM NO.6 (RING, SNUBBER) TO ITEM NO.1 (ISOLATOR HOUSING) SNUBBER SHOULD NOT PEEL OFF UNDER A 3/8 INCH AXIAL DEFLECTION CONCURRENT WITH THE APPLICATION OF A 400 LB. LOAD ON THE SNUBBER ELEMENT WITH EQUIVALENT OF SNUBBER BRACKET IN PLACE.

10. ALTERNATE FABRICATION AND ASSEMBLY OF MOUNT, RESILIENT, REAR (INSEPARABLE) ASSEMBLY.

(L1) 11. INSERT ITEM (7) MUST BE .010 TO .030 BELOW SURFACE "Z"

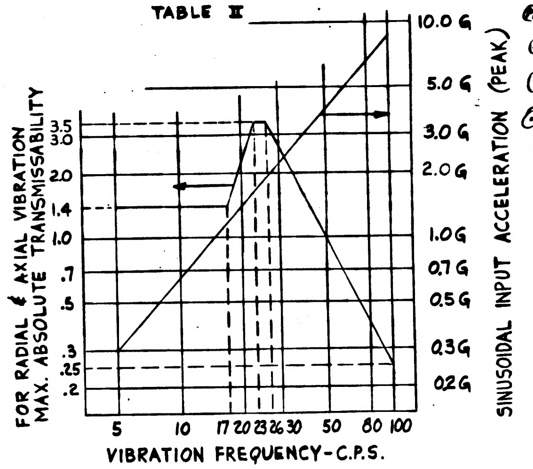
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



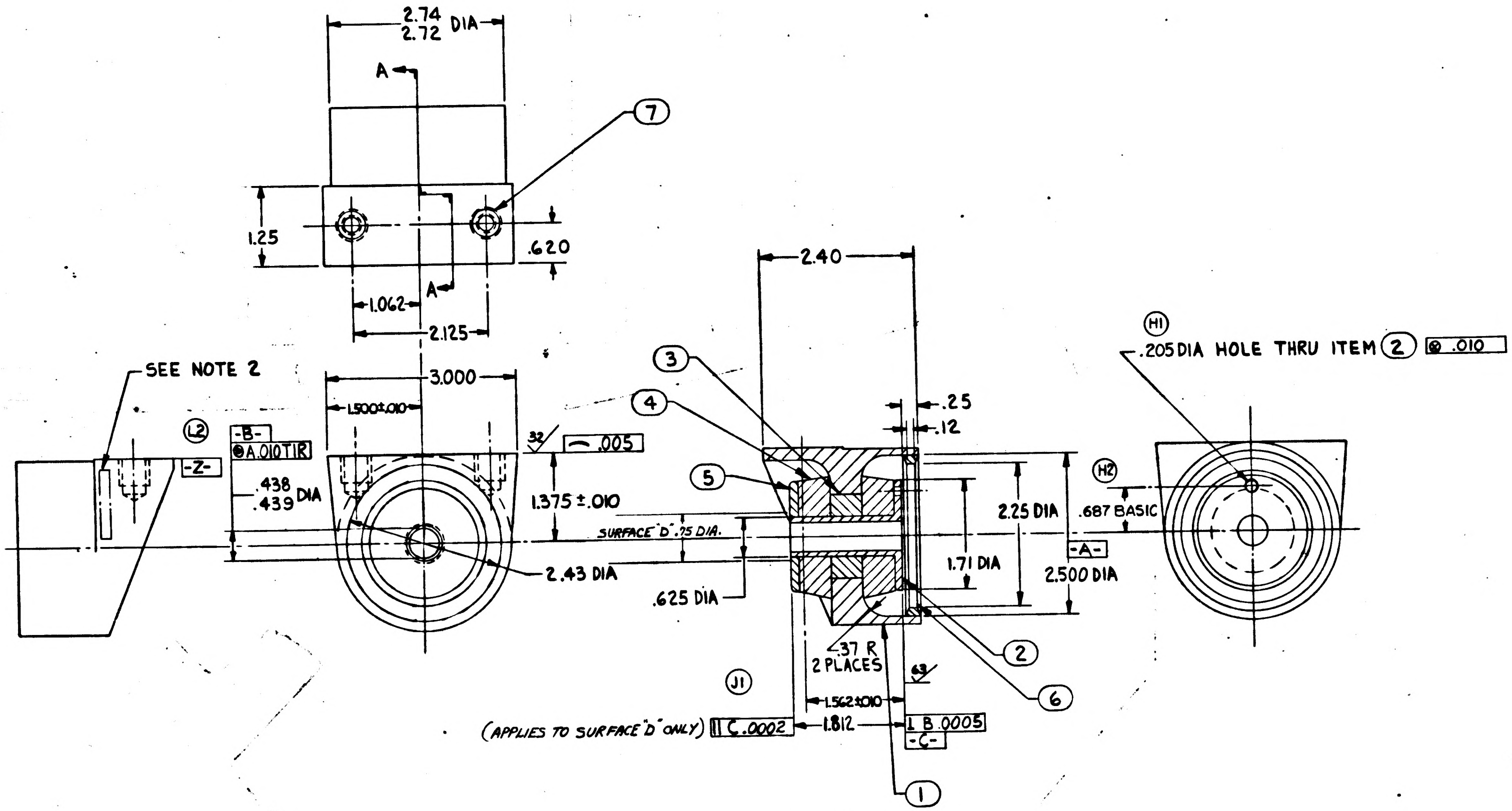
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II

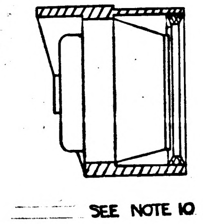


ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)

(J3)



SECTION A-A



SEE NOTE 10

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
F		REVISED AND REDRAWN TDRR 02829		8/28/63	K.E.G.
G		REVISED PER TDRR NO.03675		21 OCT. 63	WK
H_2		REVISED PER TDRR NO.04083.		31 OCT. 63	WK
J_3		REVISED PER TDRR NO.04619		20 NOV. 63	WK
K_2		REVISED PER TDRR NO.04950.		10 DEC. 63	JH
L_2		REVISED PER TDRR NO. 04491		17 DEC 63	JH

(F) REPLACES REV. E WITH CHANGES

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899969 -6	RING, SNUBBER
5	1	1899969 -5	WASHER
4	2	1899969 -4	INSERT, RESILIENT
3	1	1899969 -3	INSERT, RESILIENT
2	1	1899969 -2	CORE
1	1	1899969 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.02	+1°
- —	±.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 7

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE, WISCONSIN

ACSP PN

		DATE
DRAWN	J Korasin	13 AUG 63
CHECKED	Ogawa	19 AUG 63
APPROVAL	Lietz	19 AUG 63
APPROVAL	R Koppen	19 AUG 63
NASA APPROVAL		8/28/63
MIT APPROVAL		

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.	SIZE	
	E	1899969

SCALE 1:1 SHEET 1 OF 1

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

6966681

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO	DATE	APPD

NOTES:

ISOLATOR CHARACTERISTICS:

ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

TRANSMISSIBILITY - 3.0 MAX.

EFFECTIVE 1G LOAD PER ISOLATOR - 45 LBS.

DESIGN REQUIREMENTS:

DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN 1/32 IN UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS
RADIAL - 4000 LBS

PEEL STRENGTH - AXIAL SNUBBER BOND SHALL NOT PEEL WITH A 3/8 INCH AXIAL DEFLECTION CONCURRENT WITH THE APPLICATION OF A 400 LB RADIAL LOAD.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR CENTERLINE MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL
50±5 DUROMETER. THE RATIO OF STATIC STIFFNESS (DURING INCREASING LOAD) TO DYNAMIC STIFFNESS MUST BE GREATER THAN 0.80, FOR DEFLECTIONS LESS THAN 1/4 INCH.

MATERIAL - THE ELASTOMER SHALL NOT BE FORMULATED OF TOXIC OR ODOROUS MATERIALS.

ENVIRONMENTAL REQUIREMENTS

THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:

TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.

PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ± 5%

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

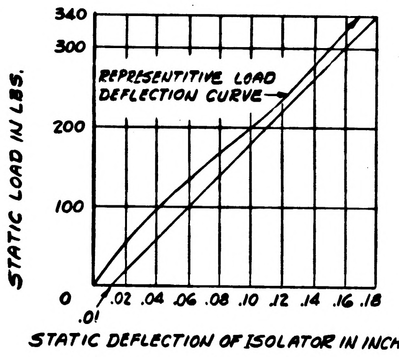
SHELF LIFE - 3 YEARS

LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

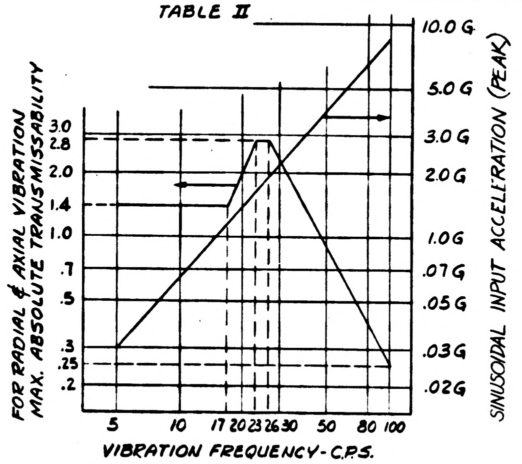
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

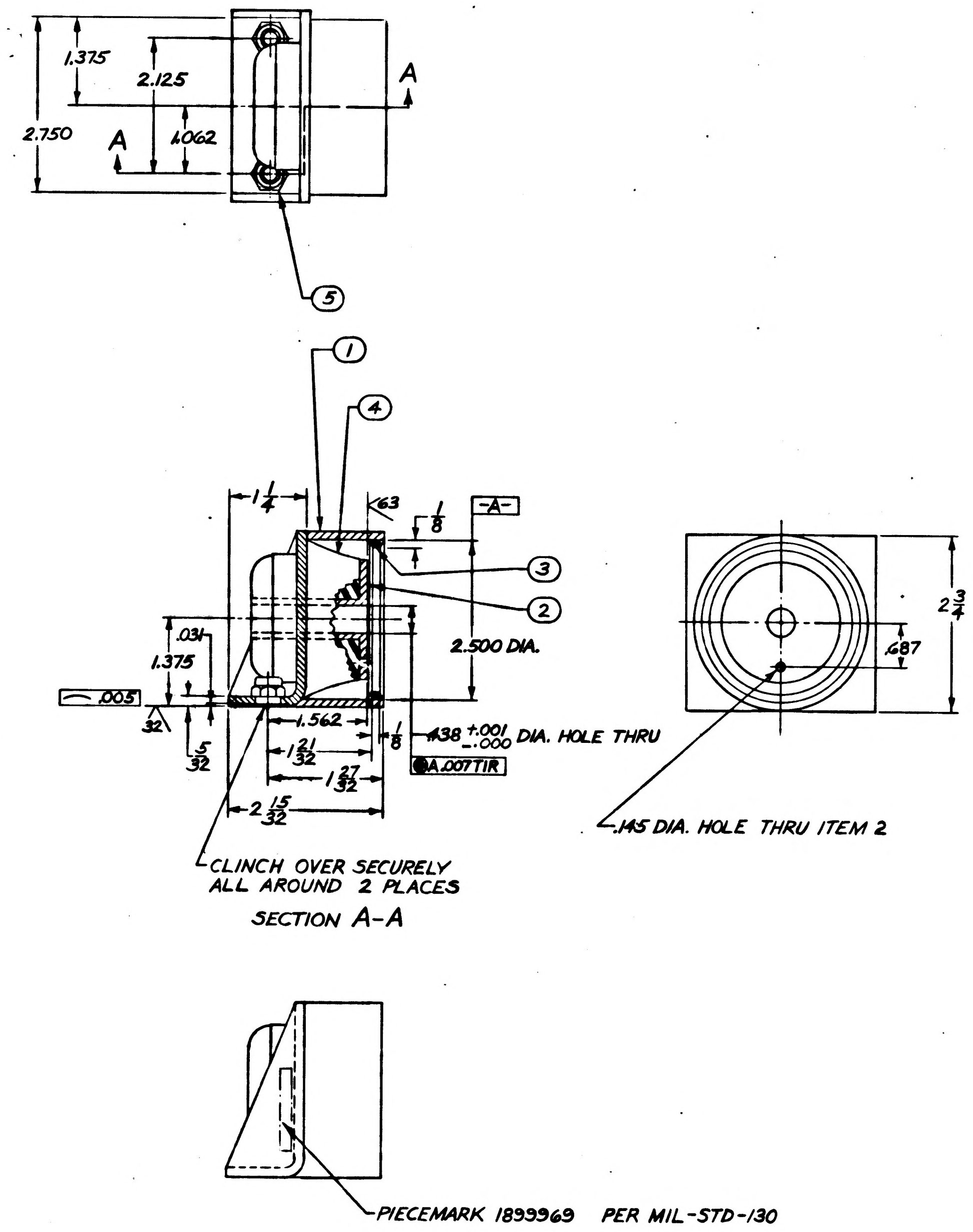


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



1.375
2.125
2.750
A
A
1.062
⑤
①
④
1 1/4
63
1/8
-A-
③
②
2.500 DIA.
.031
1.375
.005
32
5/32
1.562
1 21/32
1 27/32
2 15/32
1/8
.438 +.001 -.000 DIA. HOLE THRU
A .007 TIR
2 3/4
.687
.145 DIA. HOLE THRU ITEM 2
CLINCH OVER SECURELY ALL AROUND 2 PLACES
PIECEMARK 1899969 PER MIL-STD-130

SECTION A-A

FIND NO.	VENDOR PARTS	NO. REQD	MATERIAL	FINISH
1	ISOLATOR HOUSING	1		
2	BUSHING	1		
3	SNUBBER	1		
4	ISOLATOR	1		
5	NUT-CLINCH-SELF LOCKING 5/16-24 UNF-3B THD	2	CORROSION RESISTANT STEEL 18-8	

1899969

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0055 - DATE

NEXT ASSY	USED ON
1899950	1899966

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P.F. Jones DATE 18 FEB 63
MALIKOWSKI 5 MAR 63
CHECKED
APPROVAL J. Hanna 5 MAR 63
A. J. KODEL
APPROVAL 5 MAR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

MOUNT, RESILIENT,
REAR

CODE IDENT NO.
SIZE E
1899969
SCALE 1/1
SHEET

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		UP GRADED FOR CLASS A RELEASE		APR. 63	A.J.F.

C 1899970

NOTES:

ISOLATOR CHARACTERISTICS:

ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

EFFECTIVE 1G LOAD PER ISOLATOR - 46 LBS.

DESIGN REQUIREMENTS:

DRIFT: (AFTER INITIAL DEFLECTION)
LESS THAN $\frac{1}{32}$ IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS
RADIAL - 5000 LBS
AXIAL - 5000 LBS (COMPRESSION)

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL
50±5 DUROMETER.

MATERIAL - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCES WITH OBJECTIONABLE ODOR.

ENVIRONMENTAL REQUIREMENTS

THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:

TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.

PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ±5%

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE)

SHELF LIFE - 3 YEARS

LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION $\frac{1}{8}$ IN. FROM THE ZERO LOAD ℄.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

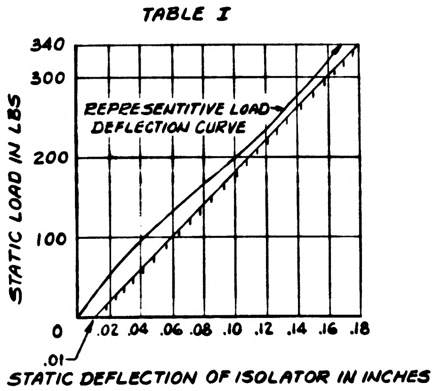
1▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

2▷ QQ-S-763 CLASS 302, COND A, STAINLESS STEEL

3▷ MIL-F-14072 (SIG C) FIN E-300 (PASSIVATE)

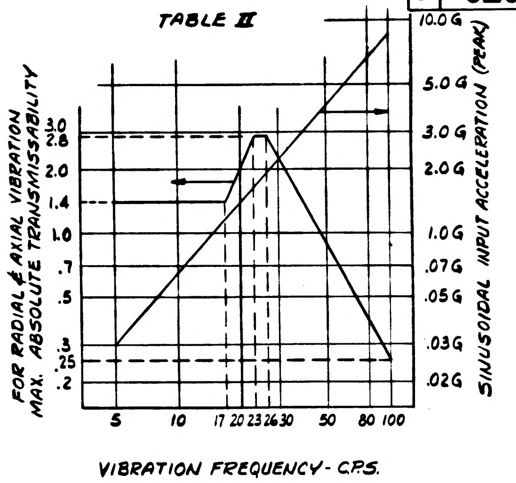
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

TABLE I

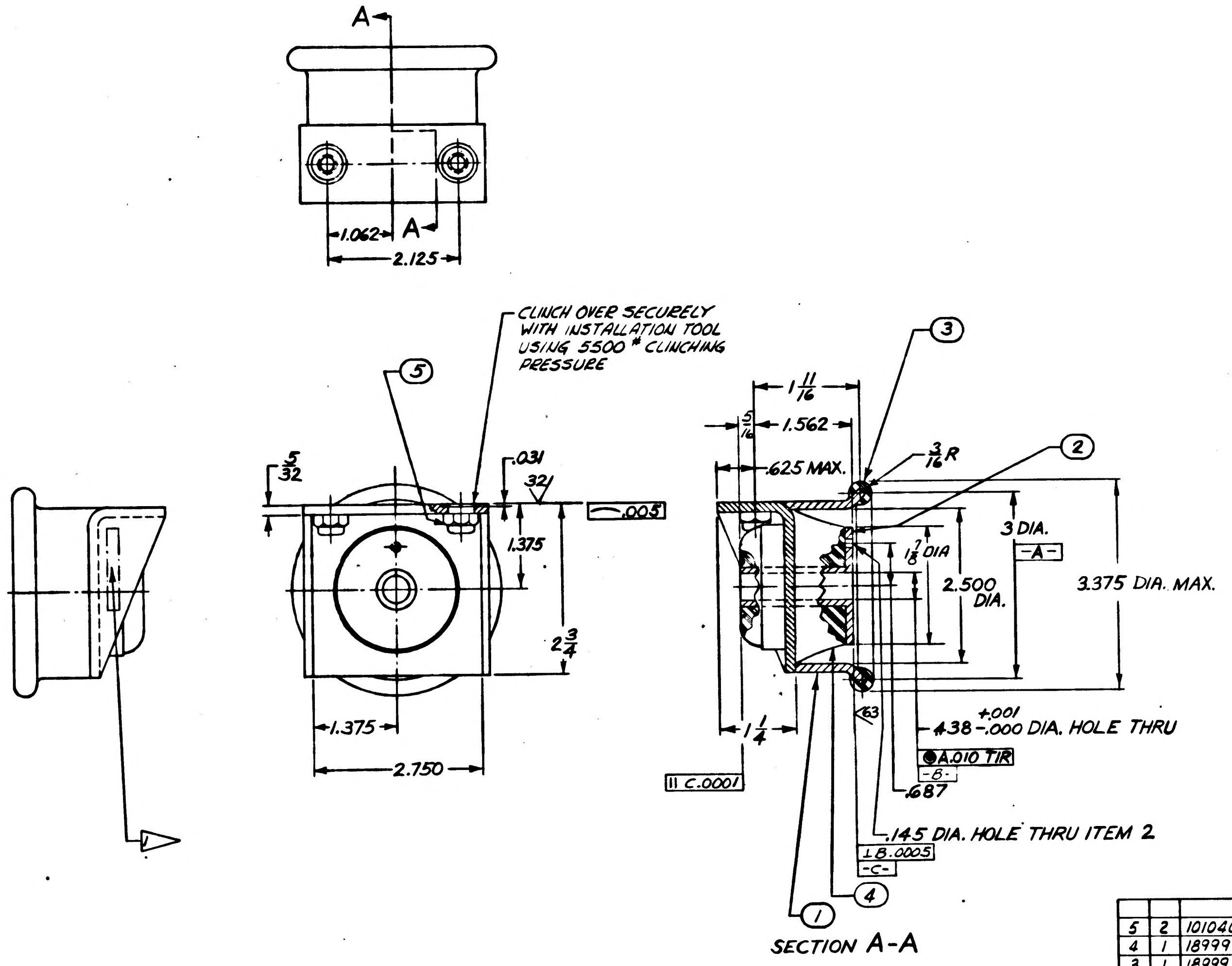


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
5	2	1010404-019	NUT-CLINCH, SELF LOCKING
4	1	1899970-4	ISOLATOR
3	1	1899970-3	SNUBBER
2	1	1899970-2	BUSHING 2▷ 3▷
1	1	1899970-1	ISOLATOR HOUSING 2▷ 3▷

LIST OF PARTS AND MATERIALS

1899970

00554

MAR

1899950-011	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 −1/64 DECIMALS +.005 −.005 ANGLES + — − — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN E. F. Jones DATE 20 FEB 63 CHECKED MALIKOWSKI 5 MAR 63 APPROVAL J. Hann 5 Mar 63 APPROVAL A. J. Koob 5 MAR 63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS MOUNT, RESILIENT, FRONT (INSEPARABLE) ASSEMBLY
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL 13 March 63	CODE IDENT NO · SIZE E · 1899970
APPLICATION		CONTRACT NAS 9-497	MIT APPROVAL 13 Mar 63	SCALE 1/1 · SHEET

PHOTOGRAPHIC SCALE ONLY
INCHES
0 1 2

1899970 C

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
REVISIONS					
C		UP GRADED FOR TDRR 0144 CLASS A RELEASE		27 APR. 63	A.J.F.
D		REVISED IN ACCORDANCE WITH TDRR 01972			23 May 63 wk

NOTES:

ISOLATOR CHARACTERISTICS:

ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

EFFECTIVE 1G LOAD PER ISOLATOR - 46 LBS.

DESIGN REQUIREMENTS:

DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN 1/32 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS - RADIAL AND AXIAL DIRECTION, 78 G's, 11 MILLI-SEC TERMINAL PEAK SAWTOOTH WAVE SHAPE.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL 50±5 DUROMETER.

MATERIAL - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCES WITH OBJECTIONABLE ODOR.

ENVIRONMENTAL REQUIREMENTS

THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:

TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.

PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ±5%

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE)

SHELF LIFE - 3 YEARS

LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION 1/8 IN. FROM THE ZERO LOAD ℄.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

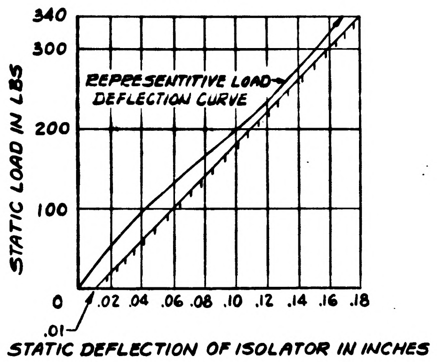
1▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

2▷ QQ-S-763 CLASS 302, COND A, STAINLESS STEEL

3▷ MIL-F-14072 (SIG C) FIN E-300 (PASSIVATE)

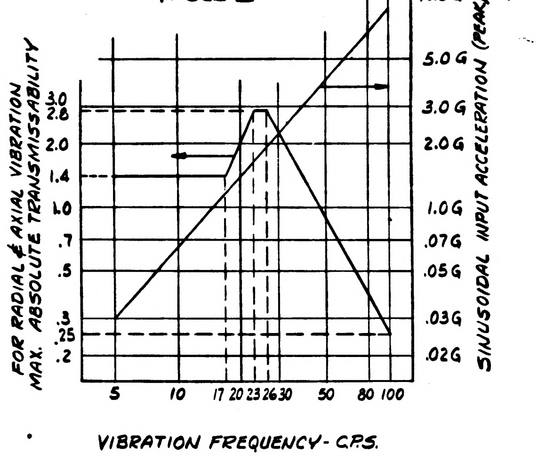
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

TABLE I

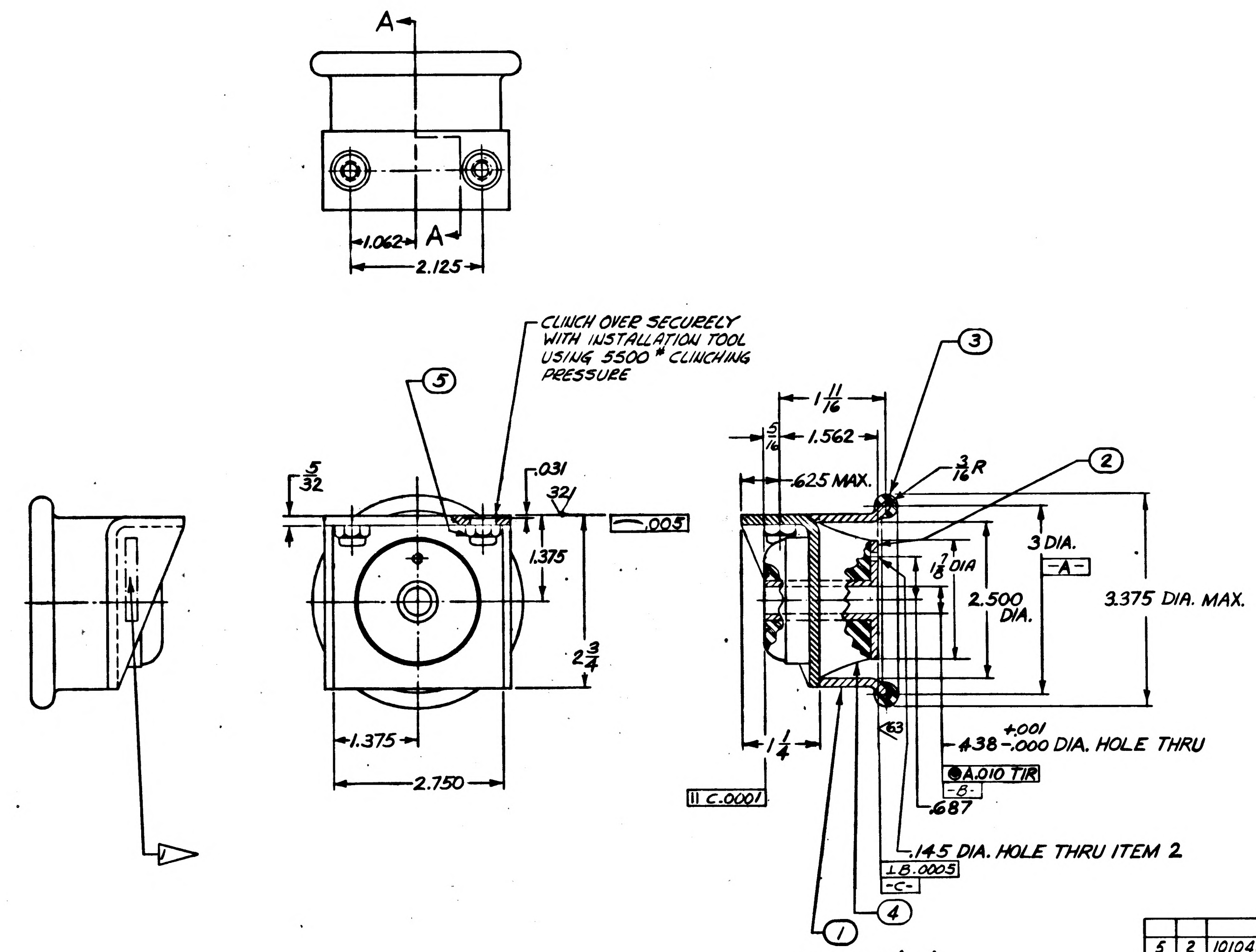


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
5	2	1010404-019	NUT-CLINCH, SELF LOCKING
4	1	1899970-4	ISOLATOR
3	1	1899970-3	SNUBBER
2	1	1899970-2	BUSHING 2▷ 3▷
1	1	1899970-1	ISOLATOR HOUSING 2▷ 3▷

LIST OF PARTS AND MATERIALS

1899970 B

00554
13MAR 63

NEXT ASSY	USED ON
1899950-011	1899950-011
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS +.005 -.005 ANGLES + — - —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E.E. Jones DATE 20 FEB 62
CHECKED MALIKOWSKI 5 MAR 63
APPROVAL J. HANN 5 MAR 63
APPROVAL A.J. Kopp L.C. 5 MAR 63
NASA APPROVAL W. J. Smith 13 March 1963
MIT APPROVAL R. Gras W Kupfer 13 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, FRONT
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899970
SCALE 1/1
SHEET

NOTES:

ISOLATOR CHARACTERISTICS:

ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

EFFECTIVE 1G LOAD PER ISOLATOR - 46 LBS.

DESIGN REQUIREMENTS:

DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN $\frac{1}{32}$ IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS - RADIAL AND AXIAL DIRECTION, 78 G's, 11 MILLI-SEC TERMINAL PEAK SAWTOOTH WAVE SHAPE.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL 50±5 DUROMETER.

MATERIAL - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCES WITH OBJECTIONABLE ODOR.

ENVIRONMENTAL REQUIREMENTS

THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:

TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.

PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ± 5%

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE)

SHELF LIFE - 3 YEARS

LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION $\frac{1}{8}$ IN. FROM THE ZERO LOAD ℄.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

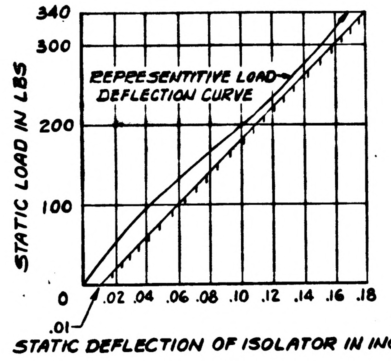
1▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

2▷ QQ-S-763 CLASS 302, COND A, STAINLESS STEEL

3▷ MIL-F-14072 (SIG C) FIN E-300 (PASSIVATE)

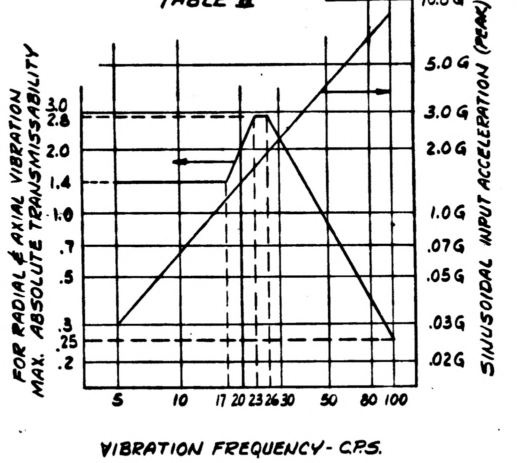
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

TABLE I

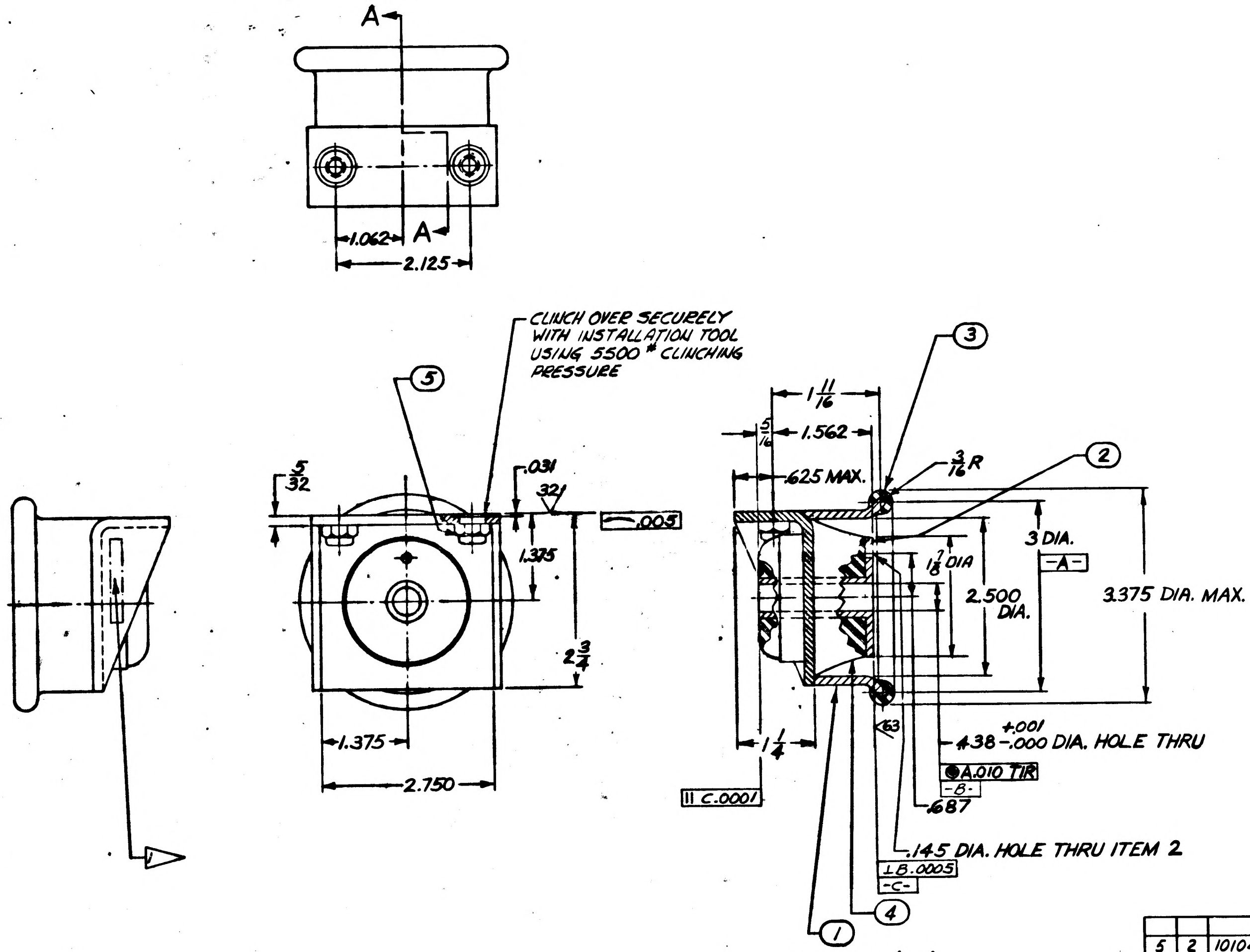


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

Ⓔ REPLACED BY REV. F WITH CHANGES

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		UP GRADED FOR CLASS A RELEASE		27 APR. 63	J.J.F.
D		REVISED IN ACCORDANCE WITH TDRR 01972			23
E		REPLACED BY REV. F WITH CHANGES. TDRR 02830		2 AUG 63	

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
5	2	1010404-019	NUT-CLINCH, SELF LOCKING
4	1	1899970-4	ISOLATOR
3	1	1899970-3	SNUBBER
2	1	1899970-2	BUSHING 2▷ 3▷
1	1	1899970-1	ISOLATOR HOUSING 2▷ 3▷

LIST OF PARTS AND MATERIALS

00554
3 MAR '63

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS +.005 -.005 ANGLES + -
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. E. Jones DATE 20 FEB 62
CHECKED MALINOWSKI 8 MAR 63
APPROVAL J. HANN 5 MAR 63
APPROVAL A. J. Koper L.C. 5 MAR 63
NASA APPROVAL 13 March 1963
MIT APPROVAL R. Bras W. Ruffe 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, FE...
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899970
SCALE 1/1
SHEET

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPACES REV E WITH CHANGES- REVISED + REDRAWN DRR 02836		8/28/63	

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER MIL-STD-130 (ES-267).
3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.
4. ISOLATOR CHARACTERISTICS:
   ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
   EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.
5. DESIGN REQUIREMENTS:
   DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

   SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

   RETURNABILITY- AFTER AN ISOLATOR DEFLECTION OF .37 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.
6. ENVIRONMENTAL REQUIREMENTS:
   THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
   TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

   PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
   1×10^{-4} MM HG FOR 100 HOURS.
   TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

   HUMIDITY - 95 % ± 5 %.

   FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

   SHELF LIFE - 3 YEARS.

   LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION .12 IN. FROM THE ZERO LOAD ℄.
7. MATERIAL: ISOLATOR HOUSING - CAST PER USING 220 T4 ALUM. ALLOY PER QQ-A-601.
   SNUBBER RING - 50 ± 5 DUROMETER.

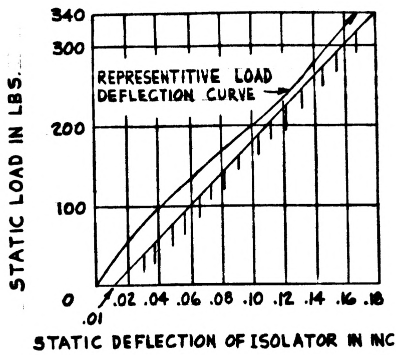
   INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

   CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

   WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).
8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES 591).
   CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

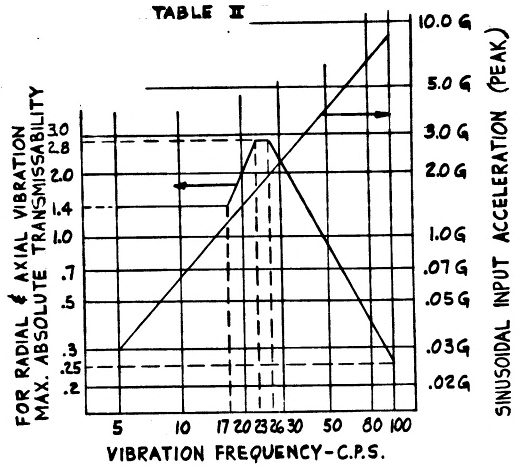
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

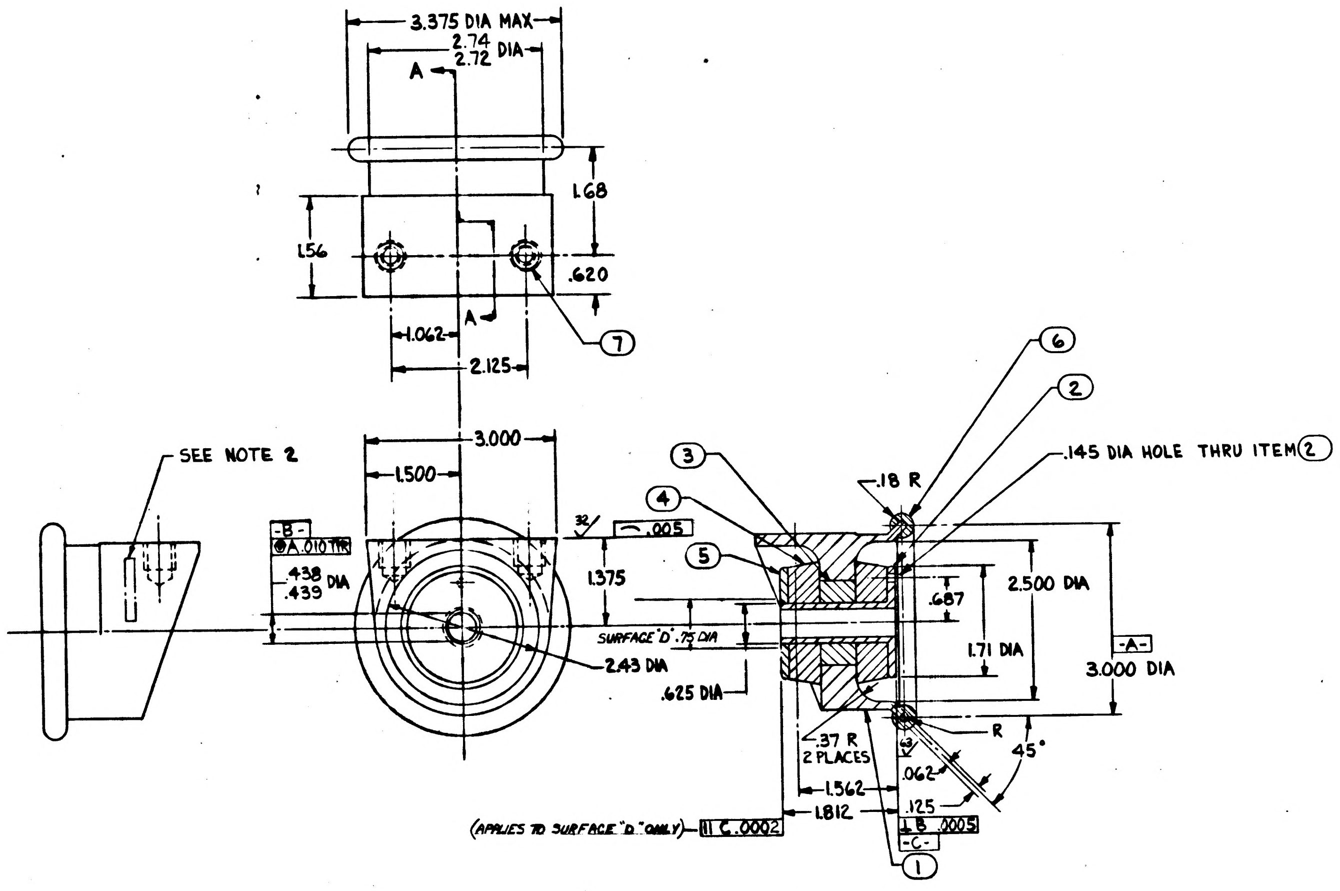


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

Ⓕ REPLACES REV. E WITH CHANGES

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899970 -6	RING, SNUBBER
5	1	1899970 -5	WASHER
4	2	1899970-4	INSERT, RESILIENT
3	1	1899970 -3	INSERT, RESILIENT
2	1	1899970 -2	CORE
1	1	1899970 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS ±.02 ±.005
ANGLES +1° −1°
DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 7
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP HN
DRAWN J Korasin DATE 9 AUG 63
CHECKED 19 AUG 63
APPROVAL LIETZ 19 AUG 63
APPROVAL 19 AUG 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, FRONT
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899970
SCALE 1:1
SHEET 1 OF 1

1899970 F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPACES REV E WITH CHANGES- REVISED + REDRAWN TDRR C2830		8/28/63	
G		REVISED PER TDRR NO.03675		21 OCT. 63	

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER ND1002023 (ES-267).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

4. ISOLATOR CHARACTERISTICS:
ISCLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.

5. DESIGN REQUIREMENTS:
DRIFT: (AFTER INITIAL DEFLECTION)
LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

RETURNABILITY- AFTER AN ISOLATOR DEFLECTION OF .37 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR..

6. ENVIRONMENTAL REQUIREMENTS:
THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95 % ± 5 %.

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS.

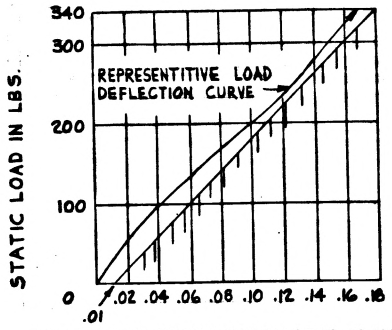
LIFE - EQUIVALENT TO 4×10^5 CYCLES, .5 DOUBLE AMPLITUDE ABOUT A NEUTRAL POSITION .12 IN. FROM THE ZERO LOAD ℄.

7. MATERIAL: ISOLATOR HOUSING - CAST PER USING 220 T4 ALUM. ALLOY PER QQ-A-601.
SNUBBER RING - 50 ± 5 DUROMETER.
INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.
CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).
WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES 591).
CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

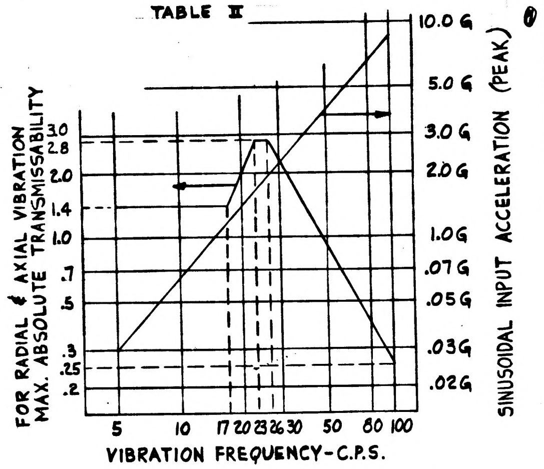
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

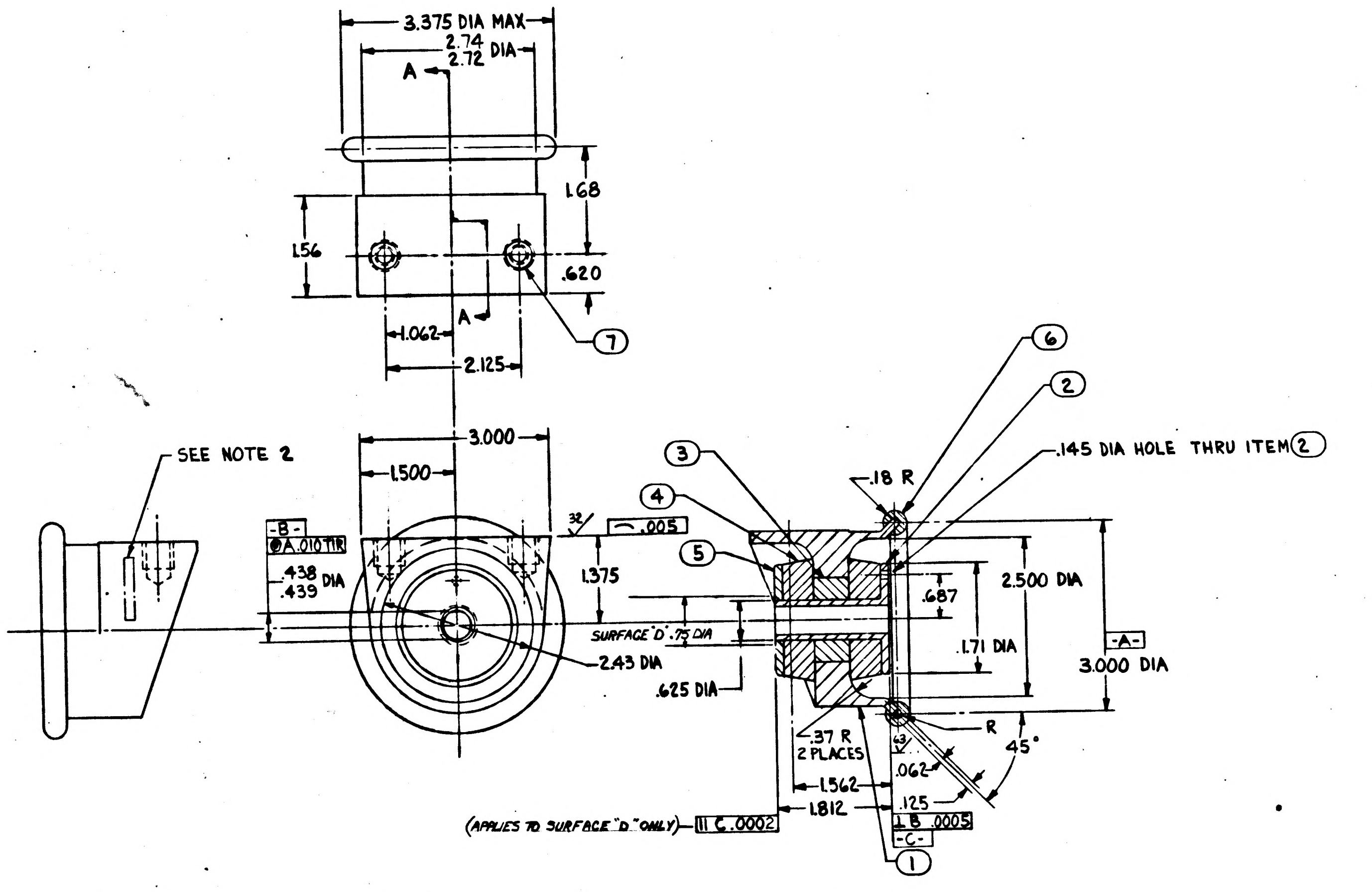


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

Ⓕ REPLACES REV. E WITH CHANGES

LIST OF PARTS AND MATERIALS

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899970 -6	RING, SNUBBER
5	1	1899970 -5	WASHER
4	2	1899970-4	INSERT, RESILIENT
3	1	1899970-3	INSERT, RESILIENT
2	1	1899970 -2	CORE
1	1	1899970 - 1	ISOLATOR, HOUSING

NEXT ASSY	USED ON
1899950-011	1899950-011
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.02	+1°
− —	±.005	−1°

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 7

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Koracin DATE 9 AUG 63
CHECKED 19 AUG 63
APPROVAL LIETZ 19 AUG 63
APPROVAL 19 AUG 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, FRONT
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899970
SCALE 1:1
SHEET 1 OF 1

1899970 G

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER ND1002023 (ES-267).
3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.
4. ISOLATOR CHARACTERISTICS:
   ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
   EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.
5. DESIGN REQUIREMENTS:
   DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

   SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

   RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .32 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR. (H5)
6. ENVIRONMENTAL REQUIREMENTS:
   THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
   TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

   PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
   1×10^{-4} MM HG FOR 100 HOURS.
   TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

   HUMIDITY - 95 % ± 5 %.

   FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

   SHELF LIFE - 3 YEARS.

   LIFE - EQUIVALENT TO 30 MINUTES RESONANCE ENDURANCE UNDER 3G PEAK SINUSOIDAL INPUT ALONG EACH AXIS. A 7G SUSTAINED ACCELERATION SHALL BE APPLIED PARALLEL TO THE AXIS OF EXCITATION. (H6)
7. MATERIAL: ISOLATOR HOUSING - CAST USING 220 T4 ALUM. ALLOY PER QQ-A-601. (H10)

   SNUBBER RING - 50 ± 5 DUROMETER.

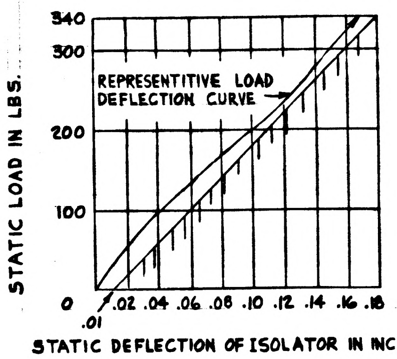
   INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

   CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

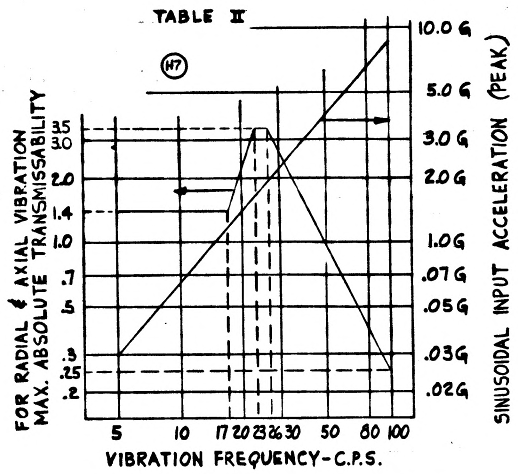
   WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).
8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES 591).
   CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).
9. STRENGTH OF BOND OF ITEM 6 (RING, SNUBBER) TO ITEM 1 (ISOLATOR HOUSING) SHALL WITHSTAND A LOAD OF 20 LBS. PER LINEAR INCH. (H11)
10. ALTERNATE FABRICATION AND ASSEMBLY OF MOUNT, RESILIENT, FRONT (INSEPARABLE) ASSEMBLY. (H12)

TABLE I

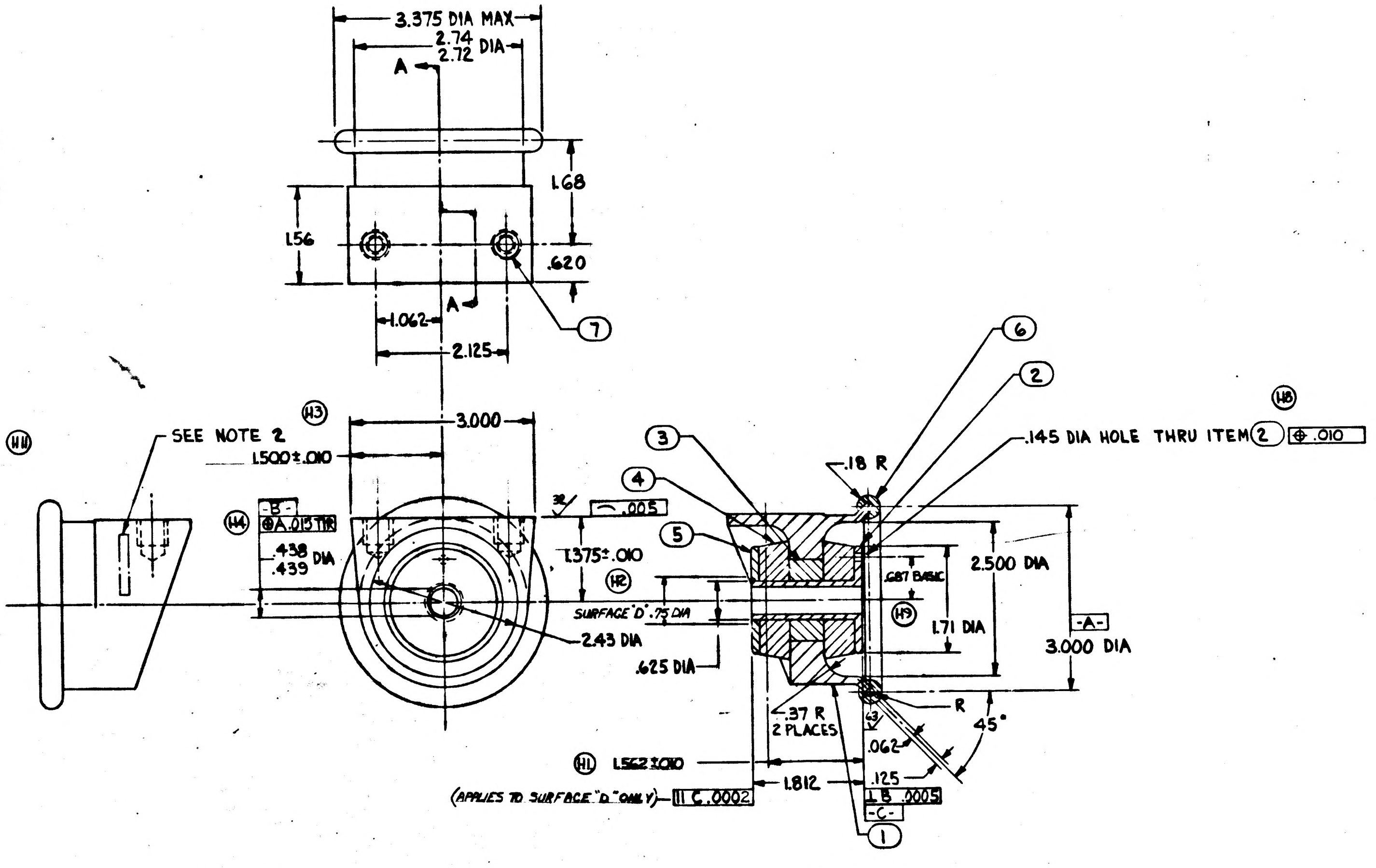
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

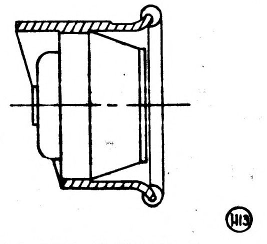


ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

Ⓕ REPLACES REV. E WITH CHANGES



SEE NOTE 10

(H13)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPLACES REV E WITH CHANGES - REVISED + REDRAWN TDRR 02830		8/28/63	
G		REVISED PER TDRR NO. 03675		21 OCT. 63	WK
H 13		REVISED PER TDRR NO. 04620		21 NOV. 63	WK

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5 L	INSERT, HEAVY DUTY, SELF LOCKING
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2	1	1899970 -2	CORE
1	1	1899970 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS ±.02 ±.005 ANGLES +1° −1°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 7
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Korasin DATE 9 AUG 63
CHECKED 19 AUG 63
APPROVAL LIETZ 19 AUG 63
APPROVAL 19 AUG 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, FRONT
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899970
SCALE 1:1
SHEET 1 OF 1

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER ND1002023 (ES-267).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

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5. DESIGN REQUIREMENTS:
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6. ENVIRONMENTAL REQUIREMENTS:
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TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

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FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS.

LIFE - EQUIVALENT TO 30 MINUTES RESONANCE ENDURANCE UNDER 3G PEAK SINUSOIDAL INPUT ALONG EACH AXIS. A 3G SUSTAINED ACCELERATION SHALL BE APPLIED PARALLEL TO THE AXIS OF EXCITATION. (H6)

7. MATERIAL: ISOLATOR HOUSING - CAST USING 220 T4 ALUM. ALLOY PER QQ-A-601. (H10)

SNUBBER RING - 50 ± 5 DUROMETER.

INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

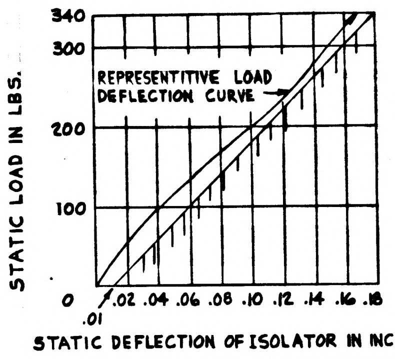
8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES 591).
CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

9. STRENGTH OF BOND OF ITEM 6 (RING, SNUBBER) TO ITEM 1 (ISOLATOR HOUSING) SHALL WITHSTAND A LOAD OF 20 LBS. PER LINEAR INCH. (H11)

10. ALTERNATE FABRICATION AND ASSEMBLY OF MOUNT, RESILIENT, FRONT (INSEPARABLE) ASSEMBLY. (H12)

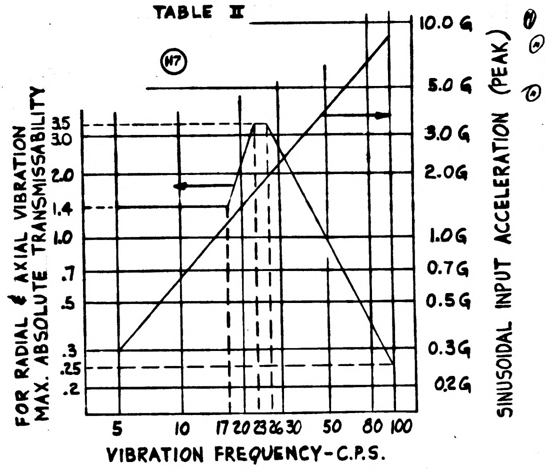
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

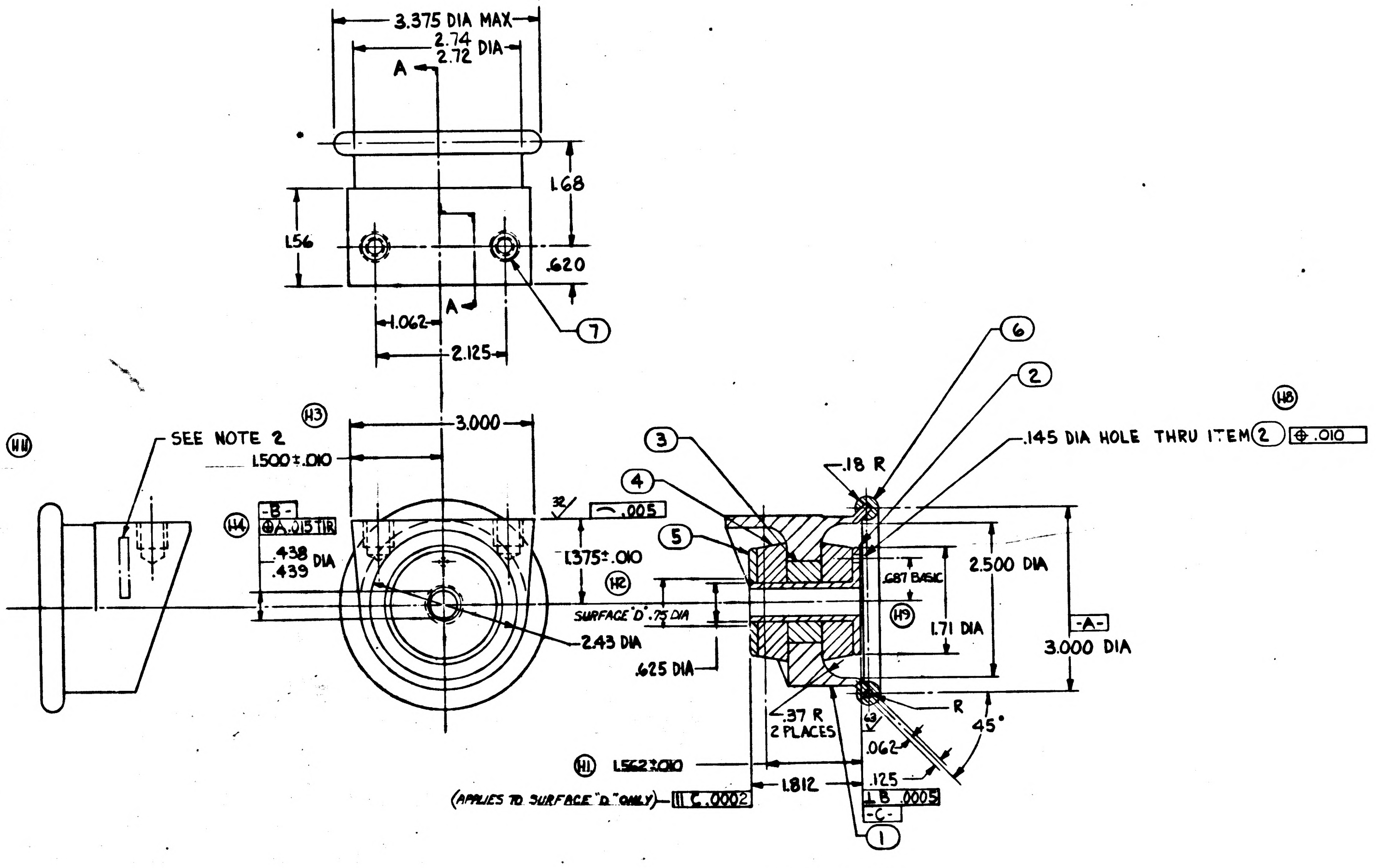


ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II

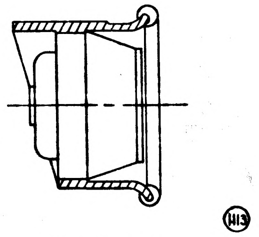


ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

Ⓕ REPLACES REV. E WITH CHANGES



SEE NOTE 10

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
F		REPLACES REV E WITH CHANGES - REVISED + REDRAWN TDRR 02830		8/28/63	
G		REVISED PER TDRR NO. 03675		21 OCT. 63	WK
H 13		REVISED PER TDRR NO. 04620		21 NOV. 63	WK
J 2		REVISED PER TDRR NO. 04947.		10 DEC. 63	

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899970 -6	RING, SNUBBER
5	1	1899970 -5	WASHER
4	2	1899970 -4	INSERT, RESILIENT
3	1	1899970 -3	INSERT, RESILIENT
2	1	1899970 -2	CORE
1	1	1899970 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	± .02	+ 1°
– —	± .005	– 1°

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 7

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F Koracin DATE 9 AUG 63
CHECKED 19 AUG 63
APPROVAL LIETZ 19 AUG 63
APPROVAL 19 AUG 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, FRONT
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899970
SCALE 1:1
SHEET 1 OF 1

1899970 J

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NUMBER, REVISION LETTER, SERIAL NO. & CURE DATE PER ND1002023 (ES-267).

3. DIMENSIONS NOT SPECIFIED ARE AT THE DISCRETION OF THE VENDOR PROVIDED THEY DO NOT VIOLATE THE DETAIL ENVELOPE.

4. ISOLATOR CHARACTERISTICS:
ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.
EFFECTIVE 1 G LOAD PER ISOLATOR - 46 LBS.

5. DESIGN REQUIREMENTS:
DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN .03 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS: RADIAL AND AXIAL DIRECTION, 78 GS, 11 MILLI-SEC TERMINAL PEAK SAW TOOTH WAVE SHAPE.

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF .32 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR MUST RETURN TO WITHIN ± .020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR. (H5)

6. ENVIRONMENTAL REQUIREMENTS:
THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:
TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501 / 502.

PRESSURE - 5 PSIA (100 % O_2) FOR 400 HOURS.
1×10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95 % ± 5 %.

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE).

SHELF LIFE - 3 YEARS.

LIFE - EQUIVALENT TO 30 MINUTES RESONANCE ENDURANCE UNDER 3G PEAK SINUSOIDAL INPUT ALONG EACH AXIS. A 3G SUSTAINED ACCELERATION SHALL BE APPLIED PARALLEL TO THE AXIS OF EXCITATION. (H6)

7. MATERIAL: ISOLATOR HOUSING - CAST ALLOY PER QQ-A-601. USING 220 T4 ALUM. (H10)

SNUBBER RING - 50 ± 5 DUROMETER.

INSERT RESILIENT - THE ELASTOMER SHALL NOT OUTGAS TOXIC OR SUBSTANCE WITH OBJECTIONABLE ODOR.

CORE - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

WASHER - QQ-S-763 CLASS 303 SE COND A CF STEEL (ES-380).

8. FINISH: ISOLATOR HOUSING - CHEMICAL FILM PER MIL-C-5541 (ES 591).
CORE & WASHER - MIL-F-14072 (SIG C) FIN E 300 (ES-585 PASSIVATE).

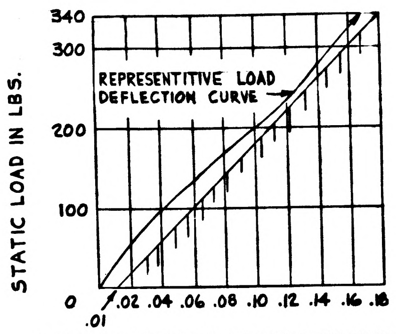
9. STRENGTH OF BOND OF ITEM 6 (RING, SNUBBER) TO ITEM 1 (ISOLATOR HOUSING) SHALL WITHSTAND A LOAD OF 20 LBS. PER LINEAR INCH. (H11)

10. ALTERNATE FABRICATION AND ASSEMBLY OF MOUNT, RESILIENT, FRONT (INSEPARABLE) ASSEMBLY. (H12)

(K1) 11. INSERT ITEM (7) MUST BE .010 TO .030 BELOW SURFACE "Z"

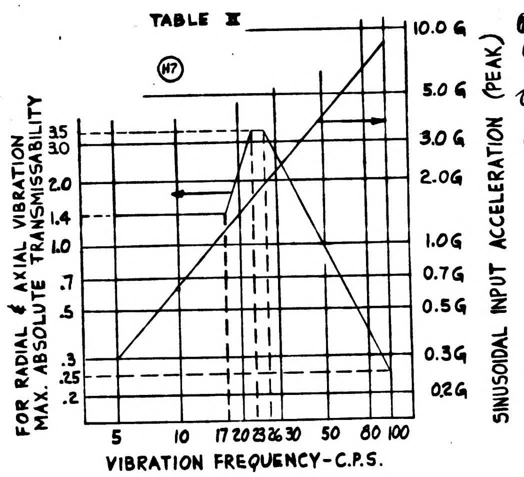
TABLE I

STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.



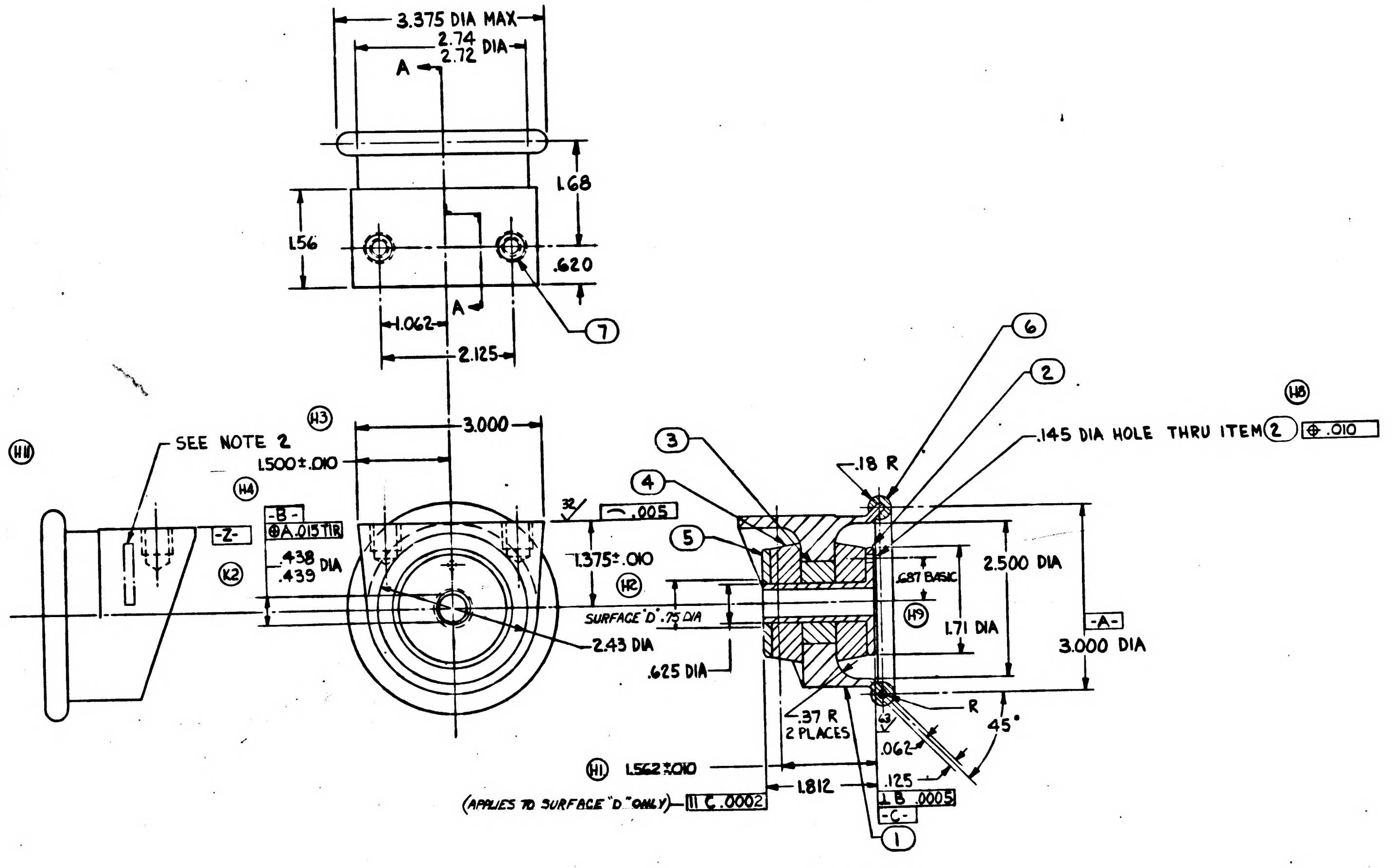
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



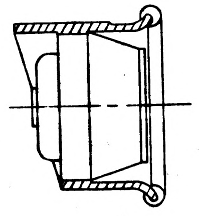
ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F (F)		REPACES REV E WITH CHANGES - REVISED + REDRAWN TDRR 02830		8/28/63	
G (N)		REVISED PER TDRR NO. 03675		21 OCT. 63	WK
H 13 (N)		REVISED PER TDRR NO. 04620		21 NOV. 63	WK.
J 2 (N)		REVISED PER TDRR NO. 04947.		10 DEC. 63	
K 2		REVISED PER TDRR NO. 04992		17 DEC 63	



SECTION A-A

(F) REPLACES REV. E WITH CHANGES



SEE NOTE 10 (H13)

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
7	2	NAS 1395 C 5L	INSERT, HEAVY DUTY, SELF LOCKING
6	1	1899970 -6	RING, SNUBBER
5	1	1899970 -5	WASHER
4	2	1899970 -4	INSERT, RESILIENT
3	1	1899970 -3	INSERT, RESILIENT
2	1	1899970 -2	CORE
1	1	1899970 -1	ISOLATOR, HOUSING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS ±.02 ±.005
ANGLES +1° −1°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 7
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J Korasin DATE 9 AUG 63
CHECKED 19 AUG 63
APPROVAL LIETZ 19 AUG 63
APPROVAL 19 AUG 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MOUNT, RESILIENT, FRONT
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE E
1899970
SCALE 1:1
SHEET 1 OF 1

1899970 K

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD

NOTES:

ISOLATOR CHARACTERISTICS:

ISOLATOR DYNAMIC & STATIC CHARACTERISTICS DEFINED IN TABLES I & II.

TRANSMISSIBILITY - 3.0 MAX.

EFFECTIVE IG LOAD PER ISOLATOR - 45 LBS.

DESIGN REQUIREMENTS:

DRIFT: (AFTER INITIAL DEFLECTION) LESS THAN 1/32 IN. UNDER A 50 LB LOAD AT 80°F FOR 6 WEEKS.

SHOCK LOADS
RADIAL - 5000 LBS COMPRESSION
AXIAL - 5000 LBS COMPRESSION

RETURNABILITY - AFTER AN ISOLATOR DEFLECTION OF 3/8 INCHES ALONG EITHER THE AXIAL OR RADIAL DIRECTION, THE ISOLATOR CENTERLINE MUST RETURN TO WITHIN ±.020 IN. OF ITS ORIGINAL POSITION WITHIN ONE (1) HOUR.

SNUBBER MATERIAL
50±5 DUROMETER. THE RATIO OF STATIC STIFFNESS (DURING INCREASING LOAD) TO DYNAMIC STIFFNESS MUST BE GREATER THAN 0.80, FOR DEFLECTIONS LESS THAN 1/4 INCH.

MATERIAL - THE ELASTOMER SHALL NOT BE FORMULATED OF TOXIC OR ODOROUS MATERIALS.

ENVIRONMENTAL REQUIREMENTS

THE ABOVE ISOLATOR CHARACTERISTICS MUST BE MET DURING AND AFTER SUBJECTION TO THE FOLLOWING ENVIRONMENTS:

TEMPERATURE - 0 TO 120°F (OPERATIONAL) PER PROCEDURES OUTLINED MIL-STD-810 METHOD 501/502.

PRESSURE - 5 PSIA (100% O_2) FOR 400 HOURS.
1 X 10^{-4} MM HG FOR 100 HOURS.
TEST PER MIL-STD-810, METHOD 500 PROCEDURE II AT 70°F.

HUMIDITY - 95% ± 5%

FUNGUS - TEST PER MIL-STD-810 METHOD 508 PROCEDURE II (I ALTERNATE)

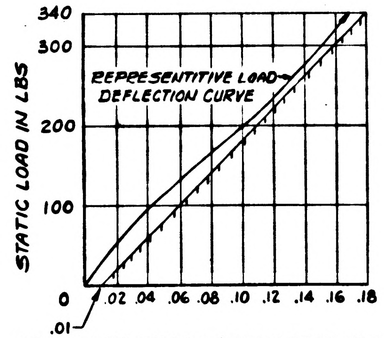
SHELF LIFE - 3 YEARS

LIFE - EQUIVALENT TO 4 X 10^5 CYCLES, .5 DOUBLE AMPLITUDE.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

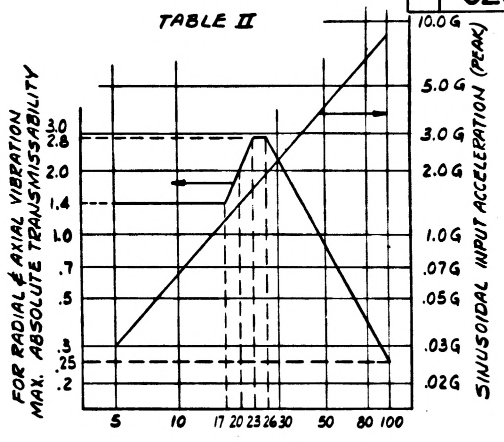
STATIC LOAD DEFLECTION CURVE (FOR INCREASING LOAD, SNUBBER NOT ACTING) MUST LIE ABOVE CROSS-HATCHED LINE.

TABLE I



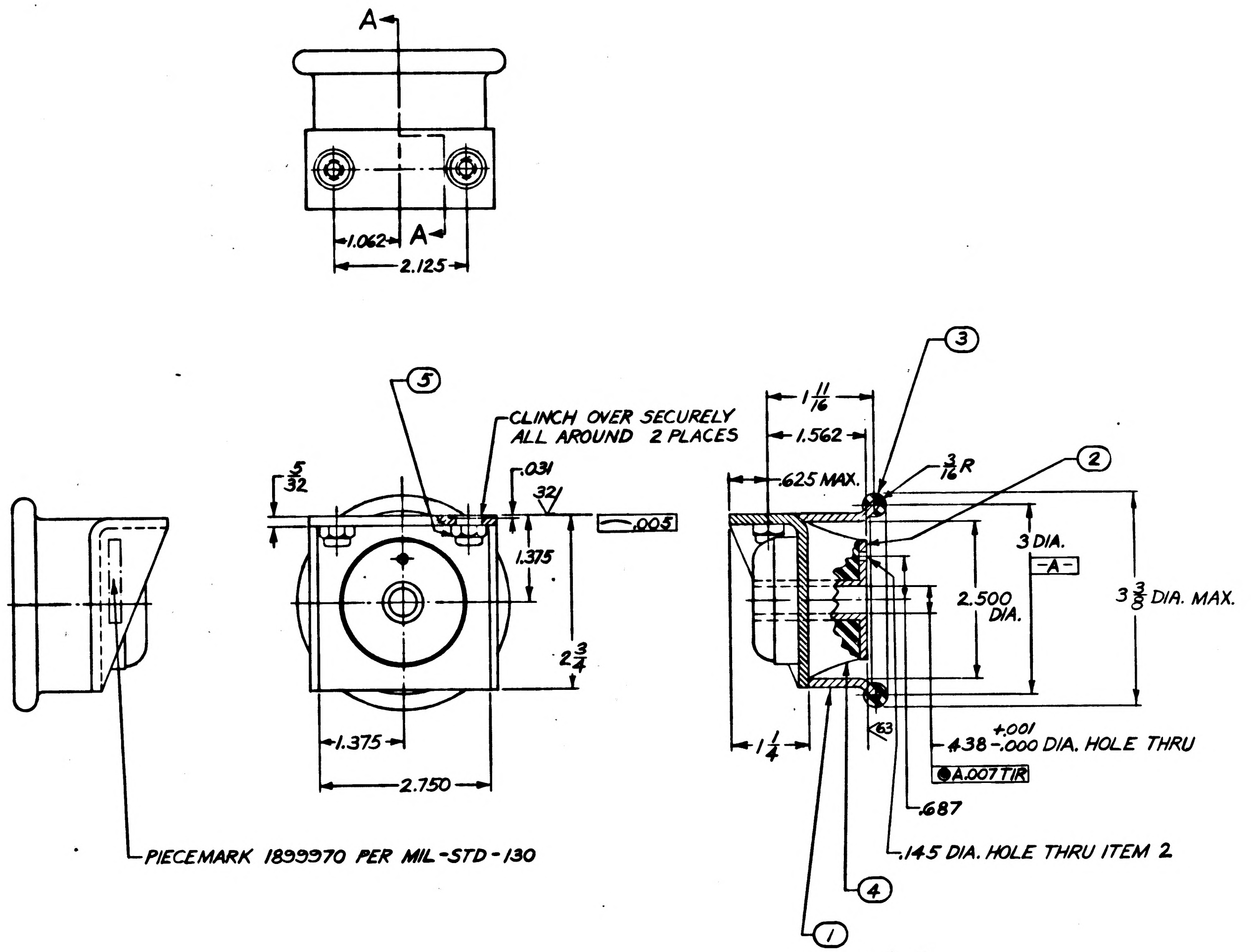
ISOLATOR STATIC CHARACTERISTICS UNDER RADIAL OR AXIAL LOAD

TABLE II



VIBRATION FREQUENCY - C.P.S.

ISOLATOR DYNAMIC CHARACTERISTICS (EFFECTIVE LOAD PER ISOLATOR: 46 LBS)



SECTION A-A

FIND NO.	VENDOR PARTS	NO. REQD	MATERIAL	FINISH
1	ISOLATOR HOUSING	1		
2	BUSHING	1		
3	SNUBBER	1		
4	ISOLATOR	1		
5	NUT-CLINCH-SELF LOCKING 5/16-24 UNF-3B THD	2	CORROSION RESISTANT STEEL 18-8	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. [illegible] DATE [illegible]

1899950 NEXT ASSY	1899966 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN S. E. Jones DATE 20 FEB 62 CHECKED MALIKOWSKI 5 MAR 63 APPROVAL J. Hann 5 Mar 63 APPROVAL A. J. Kooper 5 MAR 63	MANNED SPACECRAFT CENTER HOUSTON TEXAS MOUNT, RESILIENT, FRONT
APPLICATION		MATERIAL CONTRACT	NASA APPROVAL [illegible] MIT APPROVAL [illegible]	CODE IDENT NO SIZE E 1899970 SCALE 1/1 SHEET

1899970

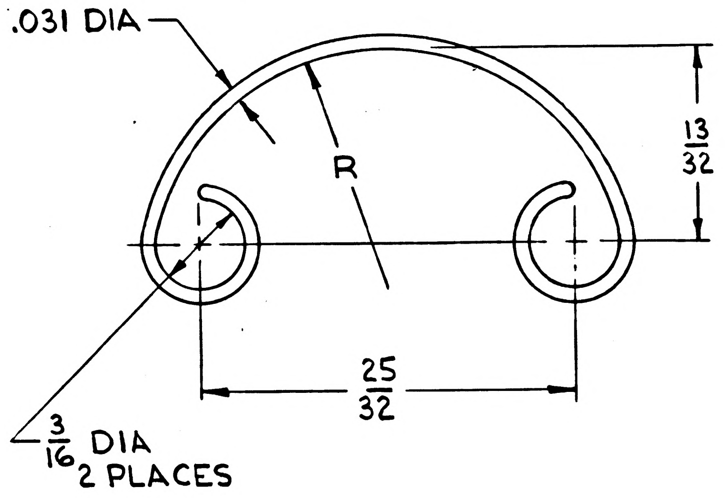
INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

REVISIONS

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 STAINLESS STEEL, QQ-W-423, COMP FS 302 OR FS 304, CONDITION B.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00554 **DATE** 13 MAR 63

1899973	1899951
1899972	1899952
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS $\pm\frac{1}{32}$ DECIMALS $\pm$— ANGLES $\pm$—
DO NOT SCALE THIS DRAWING
MATERIAL 1
21 FEB 63
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R W Heisel DATE 18 FEB 63
CHECKED 21 FEB 63
APPROVAL J. Stamm 21 FEB 63
APPROVAL A Kobel 21 FEB 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SPRING,
SEAL RETAINING

CODE IDENT NO.
SIZE C
1899971
SCALE 4:1
SHEET —

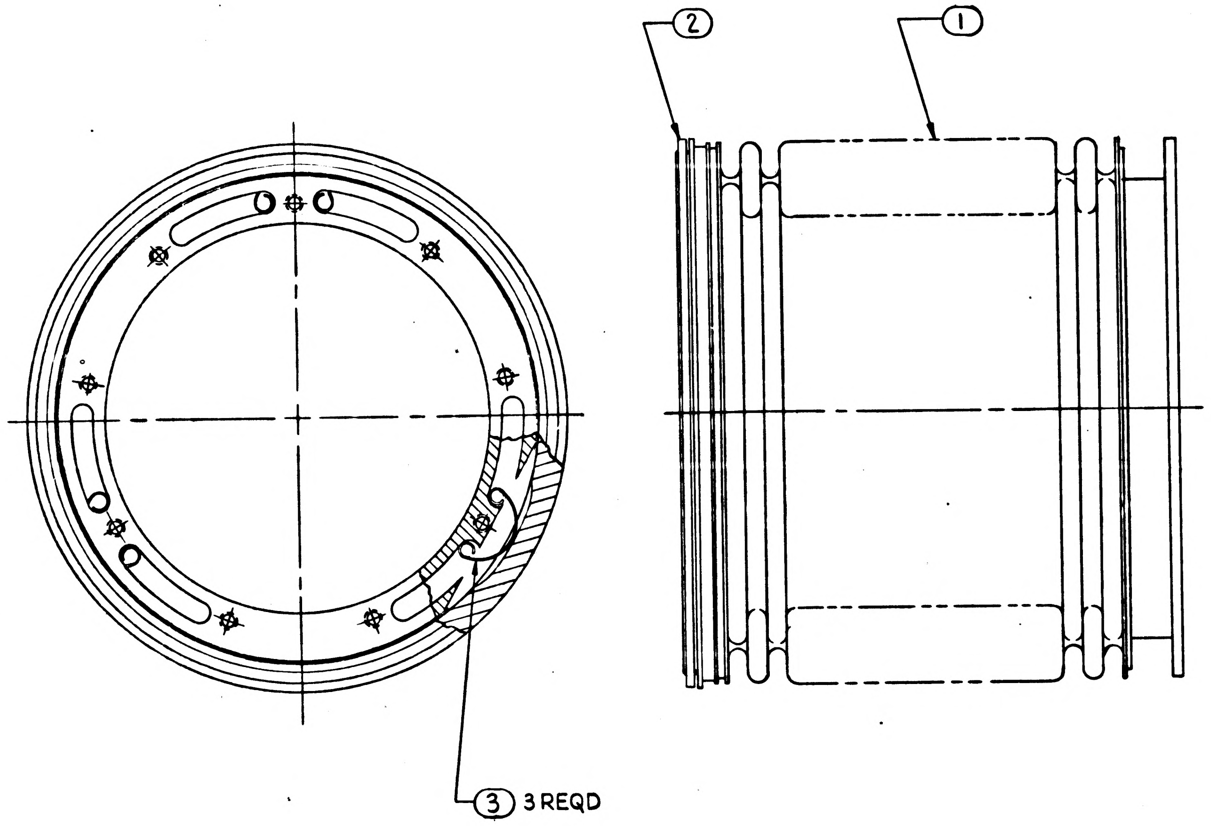
MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899972

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00554 DATE 13 MAR 1963

			3		3	1899971	SPRING-SEAL RETAINING
			1		2	1899954-001	SEAL-BELLOWS
			1		1	1899951	BELLOWS ASSY-SCT
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1899950-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
− − −
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. COOPER DATE 21 FEB 63
CHECKED MALIKOWSKI 26 FEB 63
APPROVAL J. Hann 26 FEB '63
APPROVAL 26 FEB 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS & SEAL
ASSEMBLY-SCT

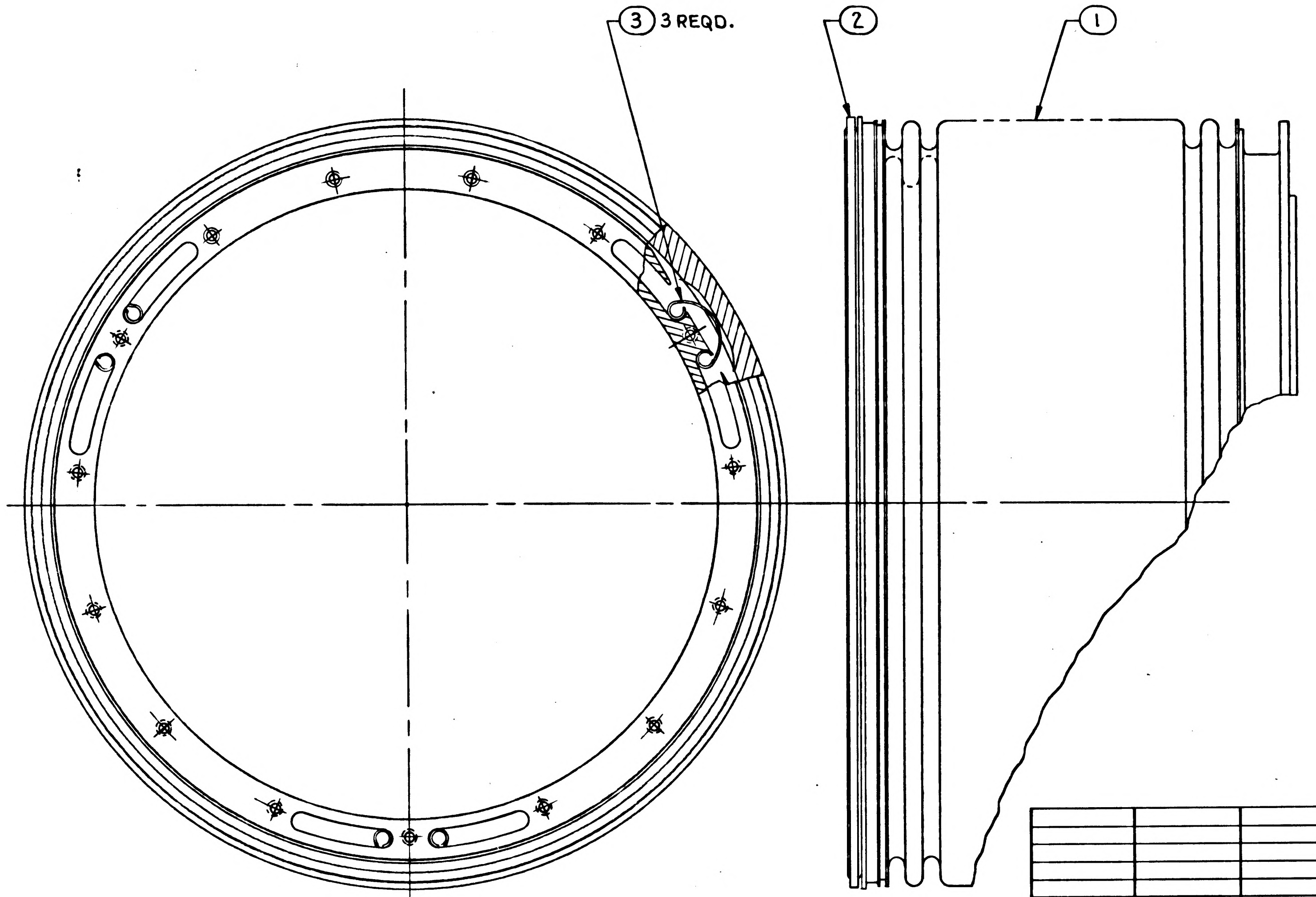
CODE IDENT NO. SIZE D 1899972
SCALE 1:1 SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899973

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO.	DATE	APPD.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00554 **DATE** 13 MAR 1963

			3		3	1899971	SPRING-SEAL RETAINING
			1		2	1899954-002	SEAL-BELLOWS
			1		1	1899952	BELLOWS ASSEMBLY-SXT
			011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1899950		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
— — — — — —

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN L. COOPER DATE 22 FEB 63
CHECKED MALIKOWSKI 26 FEB 63
APPROVAL J. Hanna 26 Feb 63
APPROVAL 26 Feb 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BELLOWS & SEAL
ASSEMBLY-SXT

CODE IDENT NO. SIZE D 1899973

SCALE 1:1 SHEET

MIL 10780-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
E		UPGRADED FOR CLASS A RELEASE TDRR 01087		27 APR 63	A.J.K.

NOTES:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 ALUMINUM ALLOY PER QQ-A-601 CL 356, COND. T51

PRECISION CAST PER MIL-C-10005.

HEAT TREAT PER MIL-H-6088, COND T6.

INSPECT PER MIL-C-6021, CLASS I_A.

2 IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED $\overset{125}{\surd}$, CAST FINISH.

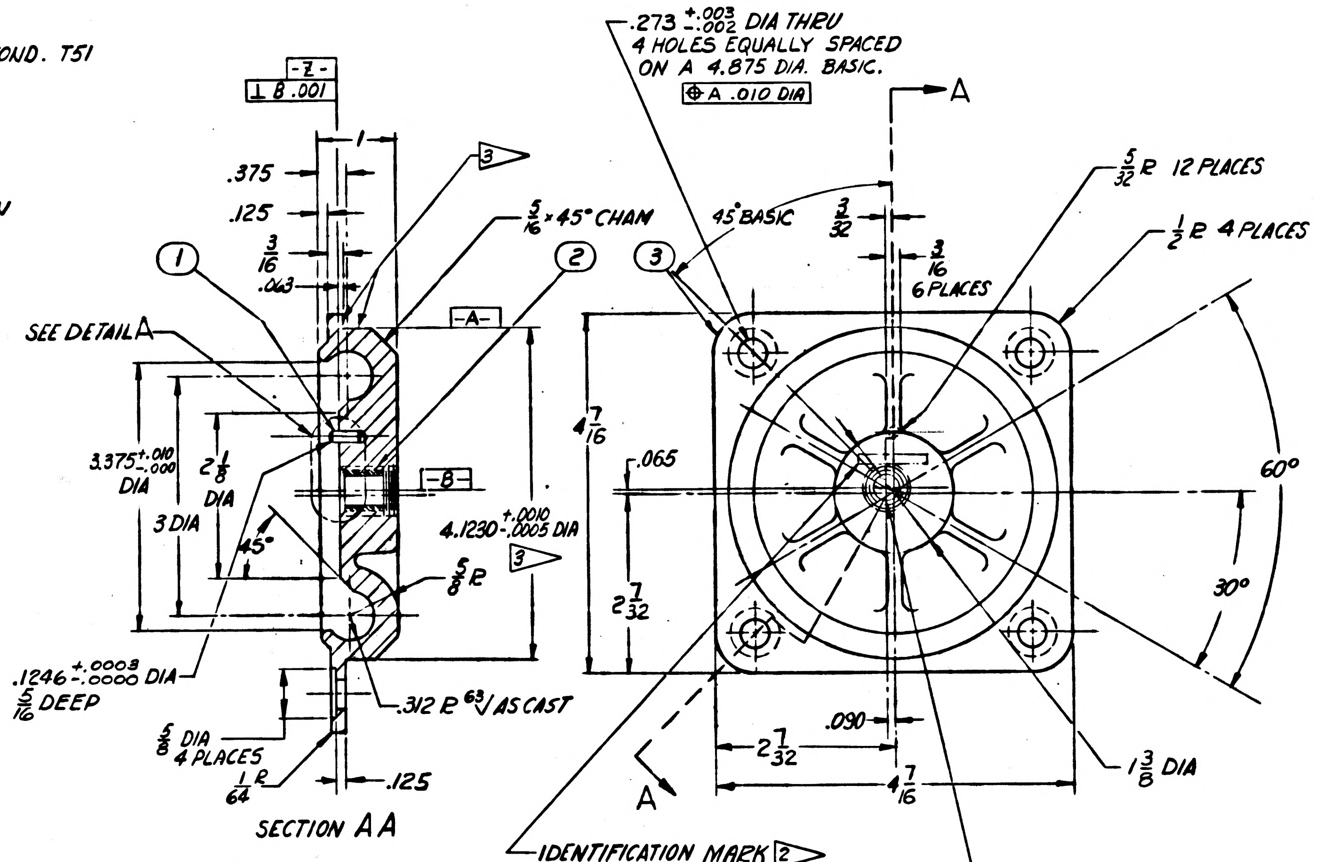
3 MACHINED SURFACES ROUGHNESS MUST NOT EXCEED $\overset{63}{\surd}$.

MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.

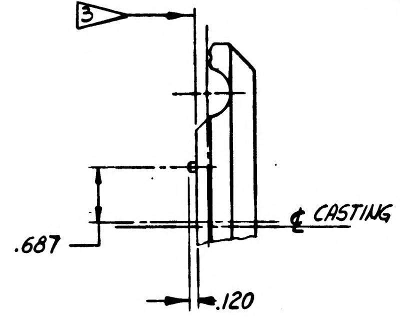
PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

FINISH: MIL-C-5541 CHEM. FILM


-Z-
⊥ B .001
1
.375
.125
3/16
.063
3
① ② ③
SEE DETAIL A
5/16 × 45° CHAM
-A-
3.375 +.010 -.000 DIA
2 1/8 DIA
3 DIA
45°
-B-
4.1230 +.0010 -.0005 DIA
5/8 R
.1246 +.0003 -.0000 DIA 5/16 DEEP
.312 R 63√ AS CAST
5/8 DIA 4 PLACES
1/64 R
.125
SECTION AA
.273 +.003 -.002 DIA THRU 4 HOLES EQUALLY SPACED ON A 4.875 DIA. BASIC.
⌖ A .010 DIA
A
45° BASIC
3/32
3/16 6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
4 7/16
.065
2 7/32
60°
30°
.090
2 7/32
4 7/16
1 3/8 DIA
A
IDENTIFICATION MARK 2

.578 +.004 -.003 DIA THRU
5/8-11 UNC-2B ¢ 90° CSK
TO MAJOR DIA OF THD
FAR SIDE.


3
¢ CASTING
.687
.120

DETAIL A

00554 13 MAR 63

ITEM NO.	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	1899974-1	SNUBBER 1
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT

LIST OF PARTS AND MATERIAL

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+1° -1°

DO NOT SCALE THIS DRAWING

MATERIAL 1

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN G. DeNicola DATE 2-21-63
MALIKOWSKI 28 FEB 63
CHECKED
APPROVAL J. HANN 4 MAR '63
APPROVAL A. J. Kodel L.C. 4 MAR 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, FRONT, LEFT HAND
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899974
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899974 F

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		UPGRADED FOR CLASS A RELEASE TDRR 01089		27 APR 63	A.J.F.
F5		REVISED IN ACCORDANCE WITH TDRR 01510			WR

(M)

NOTES:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 ▷ ALUMINUM ALLOY PER QQ-A-601 CL 356, COND. T51

PRECISION CAST PER MIL-C-10005.

(F2)

INSPECT PER MIL-C-6021, CLASS I_A.

2 ▷ IDENTIFY USING DRAWING NO., AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED $\overset{125}{\surd}$, CAST FINISH.

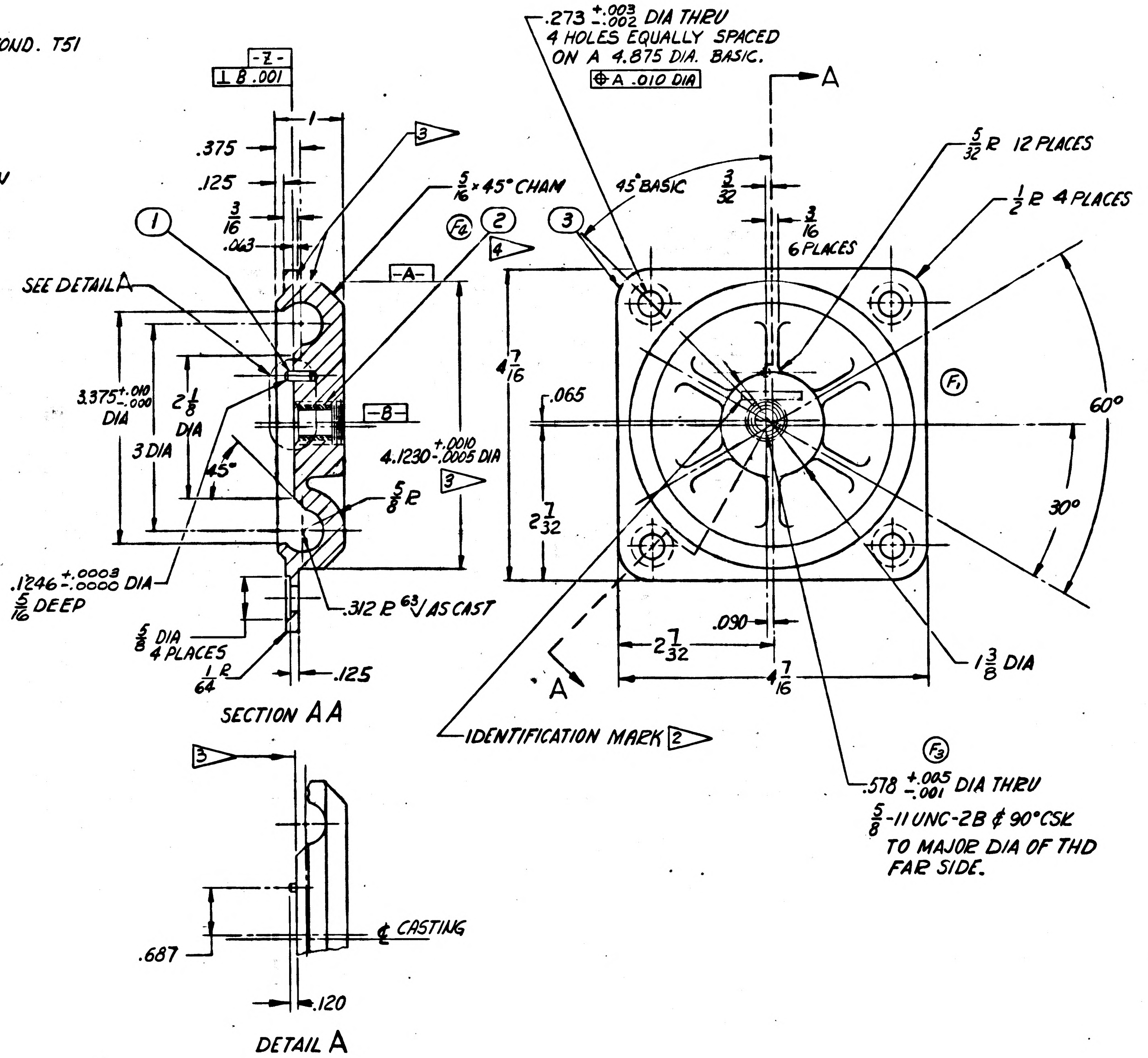
3 ▷ MACHINED SURFACES ROUGHNESS MUST NOT EXCEED $\overset{63}{\surd}$.

MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.

PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

4 ▷ INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

(F5) FINISH: MIL-C-5541 CHEM. FILM EXCEPT THREADED HOLE.


-Z-
⊥ B .001
1
.375
.125
3/16
.063
①
3 ▷
5/16 × 45° CHAM
(F4) ② 4 ▷
-A-
SEE DETAIL A
3.375 +.010 -.000 DIA
2 1/8 DIA
3 DIA
45°
-B-
4.1230 +.0010 -.0005 DIA
3 ▷
5/8 R
.1246 +.0003 -.0000 DIA
5/16 DEEP
.312 R 63√ AS CAST
5/8 DIA 4 PLACES
1/64 R
.125
SECTION AA
.273 +.003 -.002 DIA THRU
4 HOLES EQUALLY SPACED
ON A 4.875 DIA. BASIC.
⊕ A .010 DIA
A
45° BASIC
③
3/32
3/16 6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
(F1)
60°
30°
4 7/16
.065
2 7/32
.090
2 7/32
4 7/16
1 3/8 DIA
A
IDENTIFICATION MARK 2 ▷
(F3)
.578 +.005 -.001 DIA THRU
5/8-11 UNC-2B ¢ 90° CSK
TO MAJOR DIA OF THD
FAR SIDE.
3 ▷
.687
¢ CASTING
.120
DETAIL A

00554 13MAR63

3	1	1899974-1	SNUBBER 1 ▷
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT
ITEM NO.	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIAL

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$ $-\frac{1}{64}$	+.005 -.005	+1° -1°

DO NOT SCALE THIS DRAWING

MATERIAL 1 ▷

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN G. DeNICOLA DATE 2-21-63
MALIKOWSKI 28 FEB 63
CHECKED
APPROVAL J. HANN 4 MAR '63
APPROVAL A. J. KODEL L.C. 4 MAR 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, FRONT, LEFT HAND
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899974
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F 1899974

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		UPGRADED FOR CLASS A RELEASE TDRR [illegible]		27 APR 63	A.J.F.
F5		REVISED IN ACCORDANCE WITH TDRR 01510		[illegible] 63	W
G		REVISED IN ACCORDANCE WITH TDRR 01973		19 JULY 63	C.R.G. W

NOTES:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 ALUMINUM ALLOY PER QQ-A-601 CL 356, COND. T51

PRECISION CAST PER MIL-C-10005.

(F2)

INSPECT PER MIL-C-6021, CLASS IA.

2 IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED 125√, CAST FINISH.

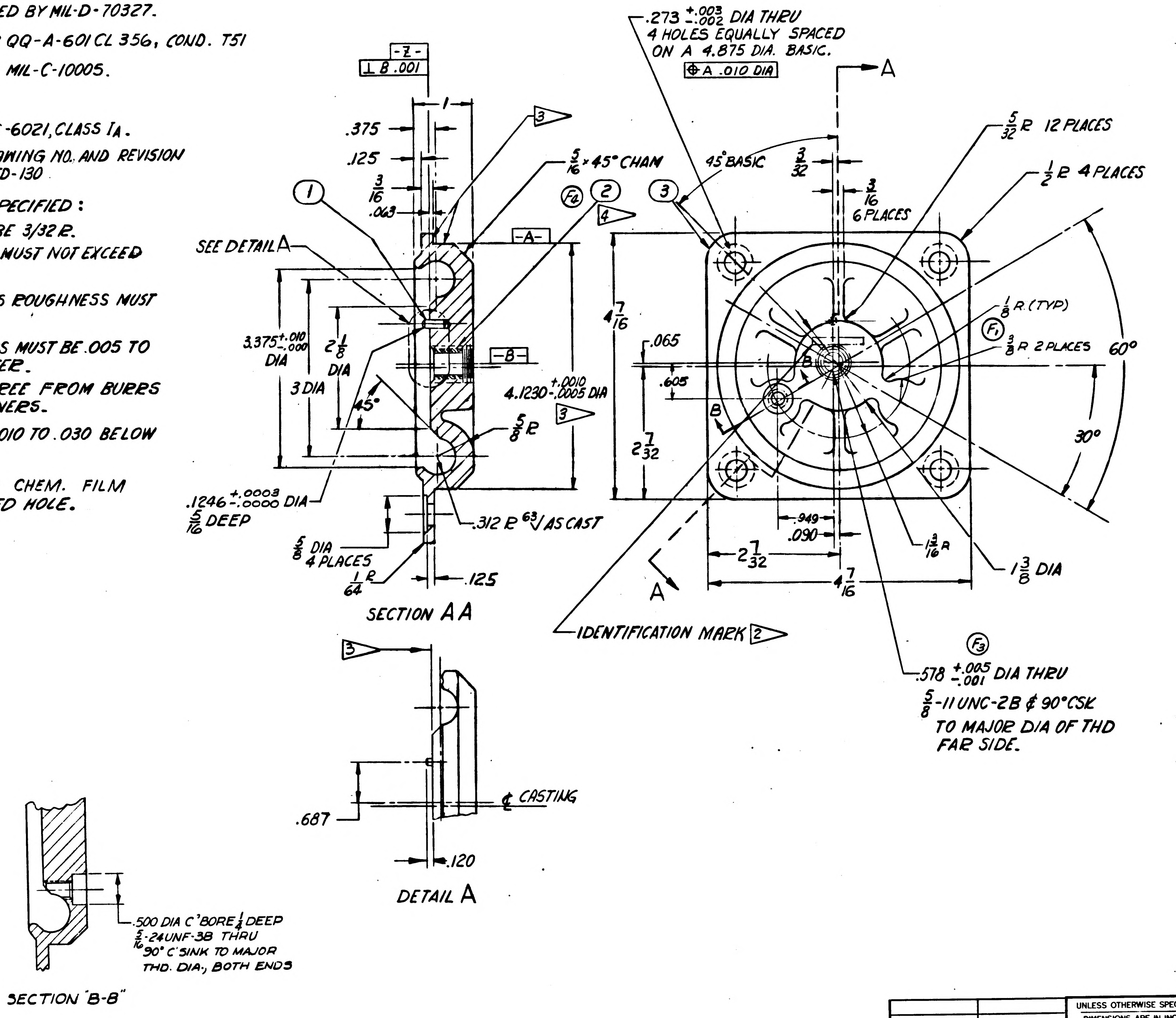
3 MACHINED SURFACES ROUGHNESS MUST NOT EXCEED 63√.

MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.

PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

4 INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

(F5) FINISH: MIL-C-5541 CHEM. FILM EXCEPT THREADED HOLE.



-Z-
⊥ B .001
.375
.125
3/16
.063
1
3
5/16 × 45° CHAM
(F2) 2
4
-A-
SEE DETAIL A
3.375 +.010 -.000 DIA
2 1/8 DIA
3 DIA
45°
-B-
4.1230 +.0010 -.0005 DIA
5/8 R
.1246 +.0003 -.0000 DIA
5/16 DEEP
5/8 DIA 4 PLACES
1/64 R
.312 R 63√ AS CAST
.125
SECTION AA
.273 +.003 -.002 DIA THRU
4 HOLES EQUALLY SPACED
ON A 4.875 DIA. BASIC.
⊕ A .010 DIA
A
45° BASIC
3/32
3/16
6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
1/8 R (TYP)
(F1)
3/8 R 2 PLACES
60°
30°
4 7/16
.065
.605
2 7/32
B
.949
.090
2 7/32
4 7/16
1 3/16 R
1 3/8 DIA
IDENTIFICATION MARK 2
(F3)
.578 +.005 -.001 DIA THRU
5/8-11 UNC-2B ⊄ 90° CSK
TO MAJOR DIA OF THD FAR SIDE.
3
.687
℄ CASTING
.120
DETAIL A
.500 DIA C'BORE 1/2 DEEP
5/16-24UNF-3B THRU
90° C'SINK TO MAJOR THD. DIA., BOTH ENDS
SECTION "B-B"

00554 13 MAR 63

3	1	1899974-1	SNUBBER 3
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT
ITEM NO.	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIAL

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN G. DeNICOLA DATE 2-21-63
MALIKOWSKI 28 FEB 63
CHECKED
APPROVAL J. HANN 4 MAR '63
APPROVAL A. J. KODEL 4 MAR 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, FRONT, LEFT HAND
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899974
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899974 H

NOTES:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 ALUMINUM ALLOY PER QQ-A-601 CL 356, COND. T51

PRECISION CAST PER MIL-C-10005.

(F2)

INSPECT PER MIL-C-6021, CLASS IA.

2 IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED 125√, CAST FINISH.

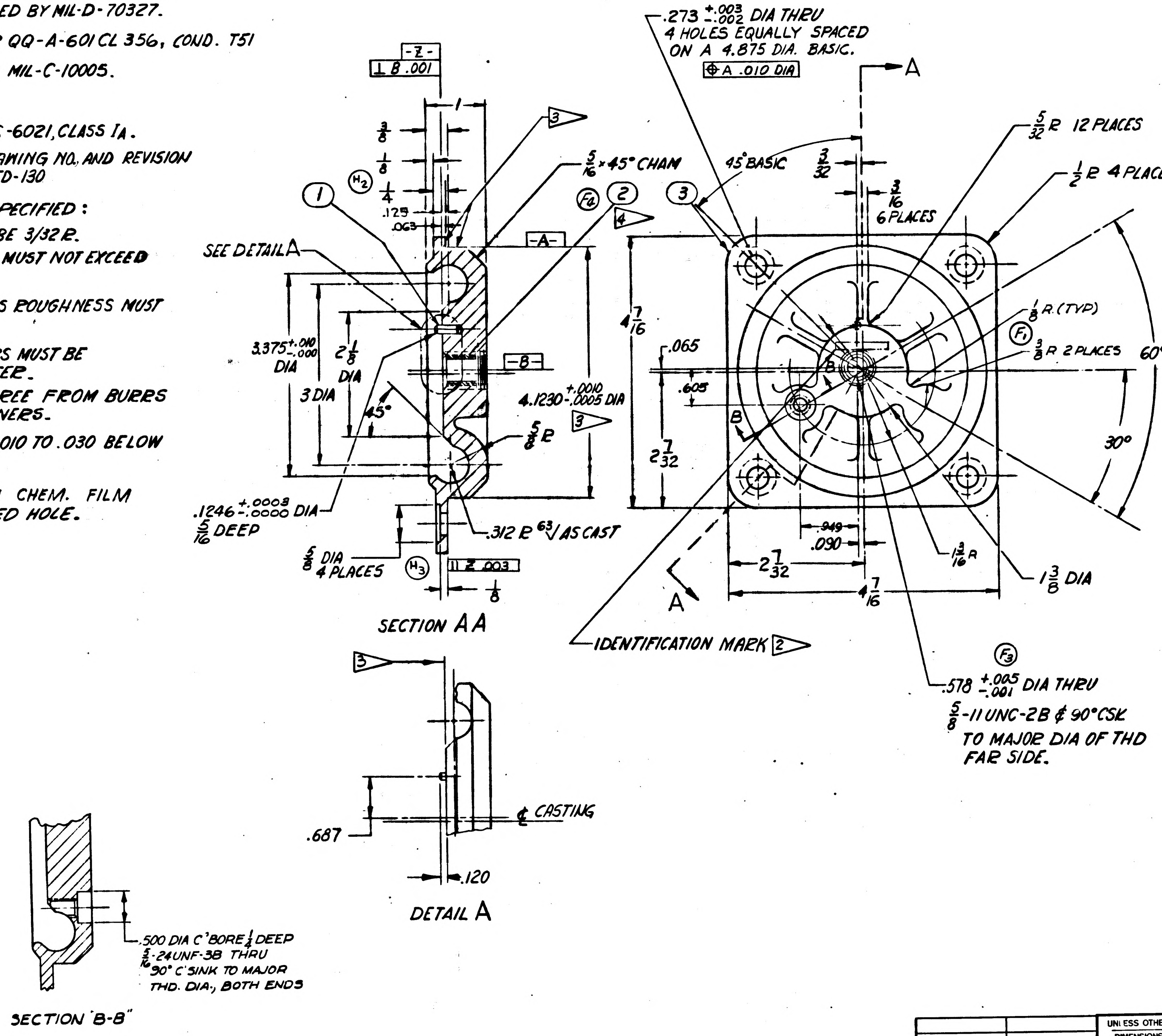
3 MACHINED SURFACES ROUGHNESS MUST NOT EXCEED 63√.

(H1) MACHINED CORNERS MUST BE $\frac{1}{32}$ R OR CHAMFER.

PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

4 INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

(F5) FINISH: MIL-C-5541 CHEM. FILM EXCEPT THREADED HOLE.


-Z-
⊥ B .001
1
3/8
1/8
1/4
.125
.063
(H2)
3
5/16 × 45° CHAM
(F4) 2
4
SEE DETAIL A
1
-A-
3.375 +.010 -.000 DIA
2 1/8 DIA
3 DIA
45°
-B-
4.1230 +.0010 -.0005 DIA
3
5/8 R
.1246 +.0003 -.0000 DIA
5/16 DEEP
.312 R 63√ AS CAST
5/8 DIA 4 PLACES
(H3)
// Z .003
1/8
SECTION AA
.273 +.003 -.002 DIA THRU
4 HOLES EQUALLY SPACED
ON A 4.875 DIA. BASIC.
⌖ A .010 DIA
A
45° BASIC
3
3/32
3/16 6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
1/8 R (TYP)
(F1) 3/8 R 2 PLACES
60°
30°
4 7/16
.065
.605
B
B
2 7/32
.949
.090
2 7/32
4 7/16
1 3/16 R
1 3/8 DIA
A
IDENTIFICATION MARK 2
(F3)
.578 +.005 -.001 DIA THRU
5/8-11 UNC-2B ⊄ 90° CSK
TO MAJOR DIA OF THD
FAR SIDE.
3
.687
⊄ CASTING
.120
DETAIL A
.500 DIA C'BORE 1/4 DEEP
3/8-24UNF-3B THRU
1/16 90° C'SINK TO MAJOR
THD. DIA, BOTH ENDS
SECTION "B-B"

00554 13MAR63

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) E		UPGRADED FOR CLASS A RELEASE TDRR 01089		27 APR 63	A.J.F.
F5		REVISED IN ACCORDANCE WITH TDRR 01510		20 June 63	Wk
(M) G		REVISED IN ACCORDANCE WITH TDRR 01973		19 JULY 63	C.R.G. Wk
H3		REVISED PER TDRR NO. 03099			9/19/63

ITEM NO.	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	1899974-1	SNUBBER 1
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT

LIST OF PARTS AND MATERIAL

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$ $-\frac{1}{64}$	+.005 -.005	+1° -1°

DO NOT SCALE THIS DRAWING

MATERIAL 1

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN G. DeNICOLA DATE 2-21-63
MALIKOWSKI 28 FEB 63
CHECKED
APPROVAL J. HANN 4 MAR '63
APPROVAL A.J. KODEL L.C. 4 MAR 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, FRONT, LEFT HAND
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899974
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

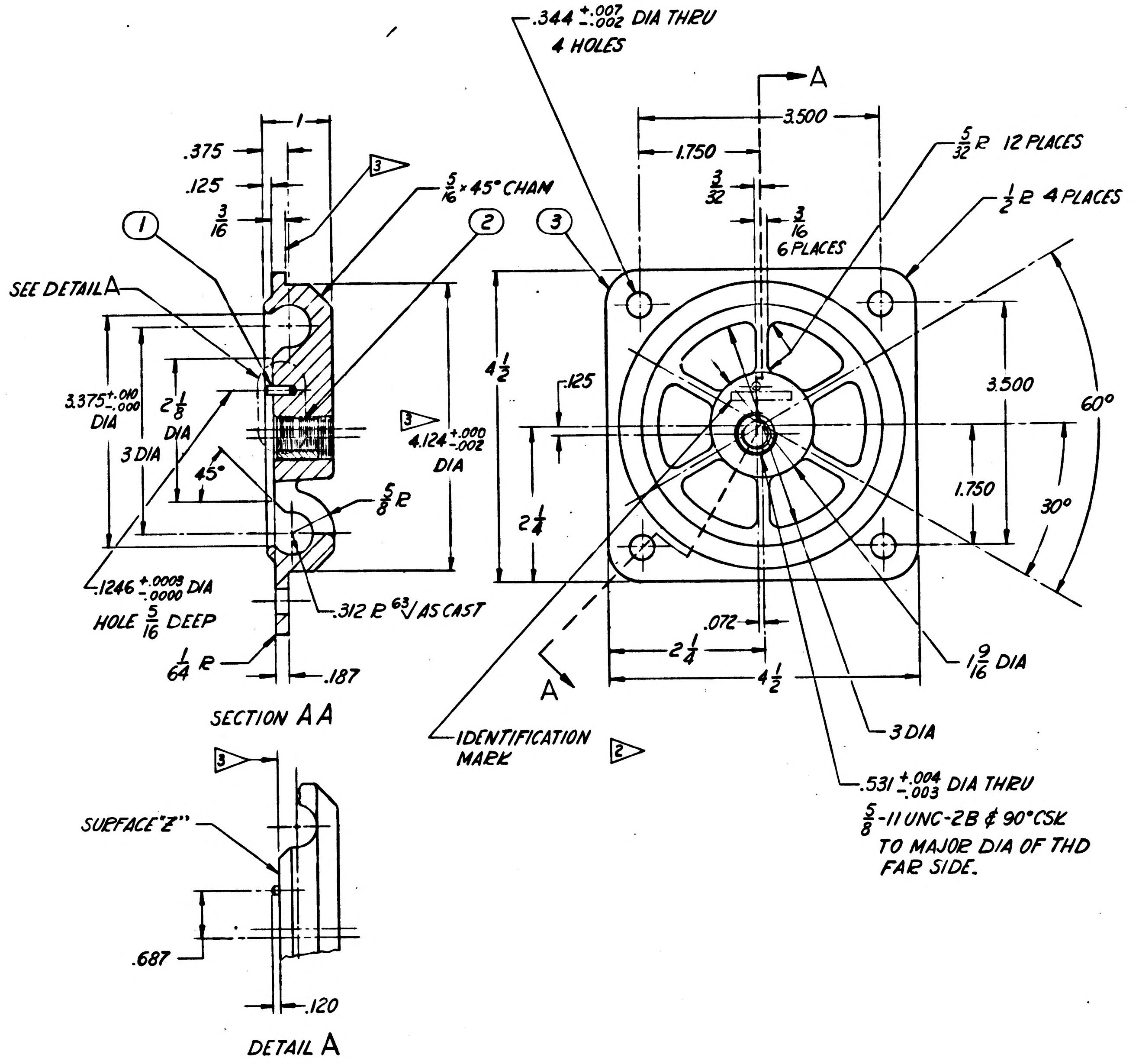
▷1 ALUMINUM ALLOY PER QQ-A-601 CL 3M.
PRECISION CAST PER MIL-C-10005.
HEAT TREAT PER MIL-H-6088, COND T6.
INSPECT PER MIL-C-6021, CLASS I_A.

▷2 MARK "1899974" IN $\frac{1}{8}$ HIGH CHARACTERS IN POSITION SHOWN PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:
ALL CAST RADII TO BE 3/32 R.
SURFACE ROUGHNESS MUST NOT EXCEED $\overset{125}{\sqrt{}}$, CAST FINISH.

▷3 MACHINED SURFACES ROUGHNESS MUST NOT EXCEED $\overset{63}{\sqrt{}}$.
MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.
PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

KEENSERT MUST BE .010 TO .030 BELOW SURFACE "Z".



.375
.125
3/16
1
▷3
5/16 x 45° CHAM
①
②
③
SEE DETAIL A
3.375 +.010 −.000 DIA
2 1/8 DIA
3 DIA
45°
▷3 4.124 +.000 −.002 DIA
5/8 R
.1246 +.0005 −.0000 DIA HOLE 5/16 DEEP
.312 R 63/ AS CAST
1/64 R
.187
SECTION AA
▷3
SURFACE "Z"
.687
.120
DETAIL A
.344 +.007 −.002 DIA THRU 4 HOLES
A
3.500
1.750
3/32
3/16 6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
4 1/2
.125
3.500
60°
1.750
30°
2 1/4
.072
2 1/4
4 1/2
1 9/16 DIA
3 DIA
A
IDENTIFICATION MARK ▷2
.531 +.004 −.003 DIA THRU
5/8-11 UNC-2B ⊄ 90° CSK TO MAJOR DIA OF THD FAR SIDE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00554 DATE 13 MAR 63

ITEM NO.	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	1899974-1	SNUBBER ▷1
2	1	NAS 1395-7	KEENSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT

LIST OF PARTS AND MATERIAL

1899950 NEXT ASSY	1899970 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +.005 −.005 DECIMALS +1/64 −1/64 ANGLES +1° −1° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN G. DeNICOLA DATE 2-21-63 MALIKOWSKI 28 FEB 63 CHECKED APPROVAL J. HANN 4 MAR '63 APPROVAL A. J. KODEL L.C. 4 MAR 63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS SNUBBER - FRONT (INSEP ASS'Y)
APPLICATION		MATERIAL ▷1 CONTRACT	NASA APPROVAL 13 March 1963 MIT APPROVAL 13 Mar 63	CODE IDENT NO. SIZE D 1899974 SCALE 1:1 SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10770-P

D 1899975 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS A RELEASE TVRR 01095		27 APR 63	A.J.F.

NOTES:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

▷1 ALUMINUM ALLOY PER QQ-A-601 CL 356.

PRECISION CAST PER MIL-C-10005.

HEAT TREAT PER MIL-H-6088, COND T6.

INSPECT PER MIL-C-6021, CLASS IA.

UNLESS OTHERWISE SPECIFIED:

ALL FILLET 1/4 R.

SURFACE ROUGHNESS SHALL NOT EXCEED 125/.

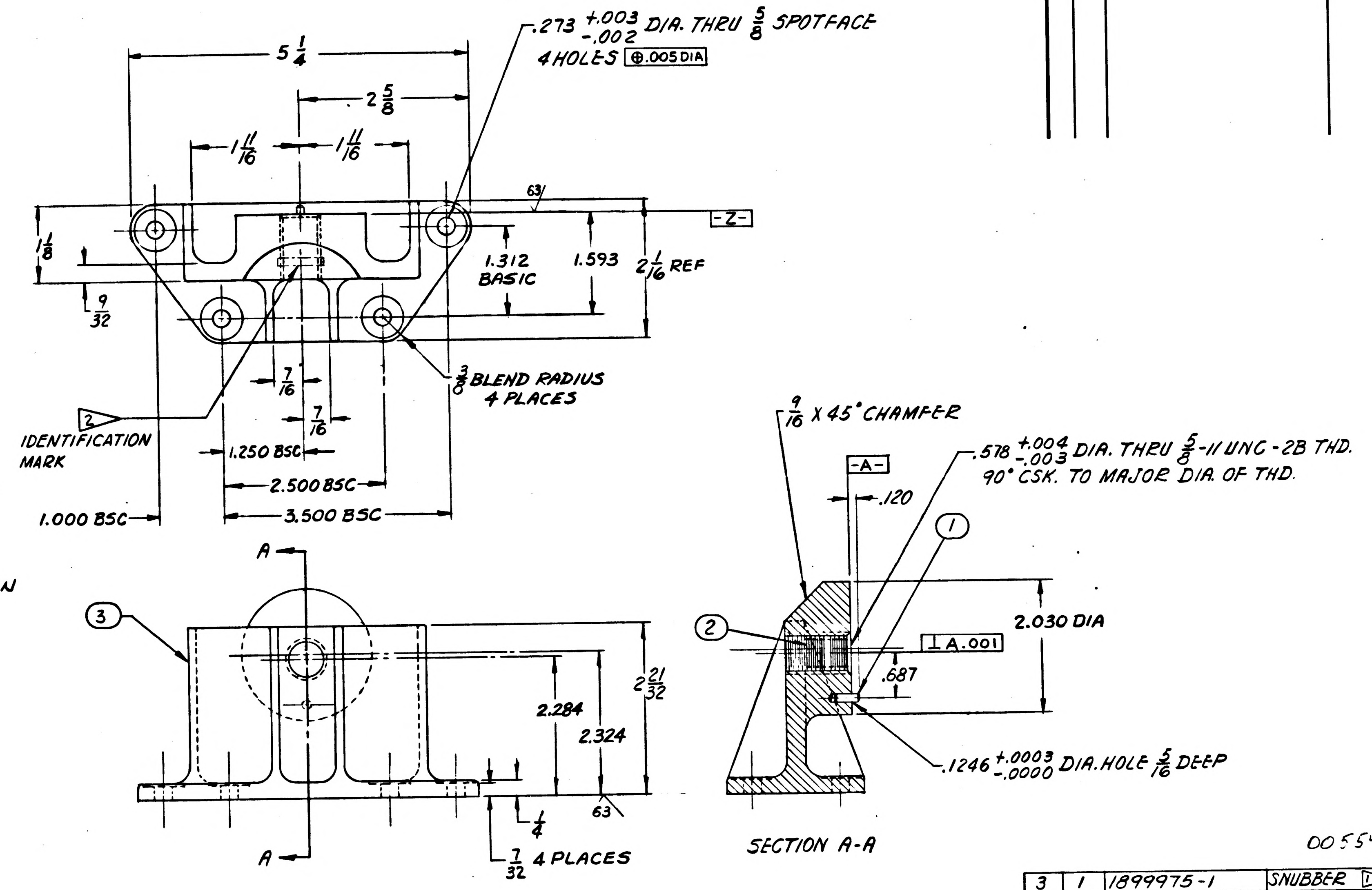
ALL WEB THICKNESS TO BE .100.

REMOVE BURRS & BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.

INSERT, ITEM ②, MUST BE .010 TO .030 BELOW SURFACE 'Z'.

FINISH: MIL-C-5541 CHEMICAL FILM

▷2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.



5 1/4
2 5/8
1 11/16
1 11/16
.273 +.003 -.002 DIA. THRU 5/8 SPOTFACE
4 HOLES ⊕.005 DIA
63/
-Z-
1 1/8
9/32
1.312 BASIC
1.593
2 1/16 REF
3/8 BLEND RADIUS
4 PLACES
7/16
7/16
▷2 IDENTIFICATION MARK
1.250 BSC
2.500 BSC
3.500 BSC
1.000 BSC
A
A
③
2.284
2.324
2 21/32
63
1/4
7/32 4 PLACES
9/16 X 45° CHAMFER
-A-
.120
.578 +.004 -.003 DIA. THRU 5/8-11 UNC-2B THD.
90° CSK. TO MAJOR DIA. OF THD.
①
②
⊥ A .001
2.030 DIA
.687
.1246 +.0003 -.0000 DIA. HOLE 5/16 DEEP
SECTION A-A

00554 13 MAR 1963

3	1	1899975-1	SNUBBER ▷1
2	1	NAS 1395-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT
ITEM NO.	REQ'D.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIAL

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL ▷1

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 2-26-63
CHECKED MALIKOWSKI 1 MAR 63
APPROVAL J HANN 4 MAR 63
APPROVAL A.J. KODEL L.C. 4 MAR 63
NASA APPROVAL W. S. Smith 13 Mar 1963
MIT APPROVAL R. Buse W. Kupfer 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899975
SCALE FULL
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10770-F

3	1899975	2	1

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) D		UPGRADED FOR CLASS A RELEASE TDRR 01090		27-APR-63	A.J.F.
E4		REVISED IN ACCORDANCE WITH TORR 01511		26 June 63	W.C.

NOTES:

. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

(E1) ▷1 ALUMINUM ALLOY PER QQ-A-601 CL 356, COND. T51.

PRECISION CAST PER MIL-C-10005.

(E2)

INSPECT PER MIL-C-6021, CLASS IA.

UNLESS OTHERWISE SPECIFIED:

ALL FILLET $\frac{1}{4}$ R.

SURFACE ROUGHNESS SHALL NOT EXCEED $\sqrt{125}$.

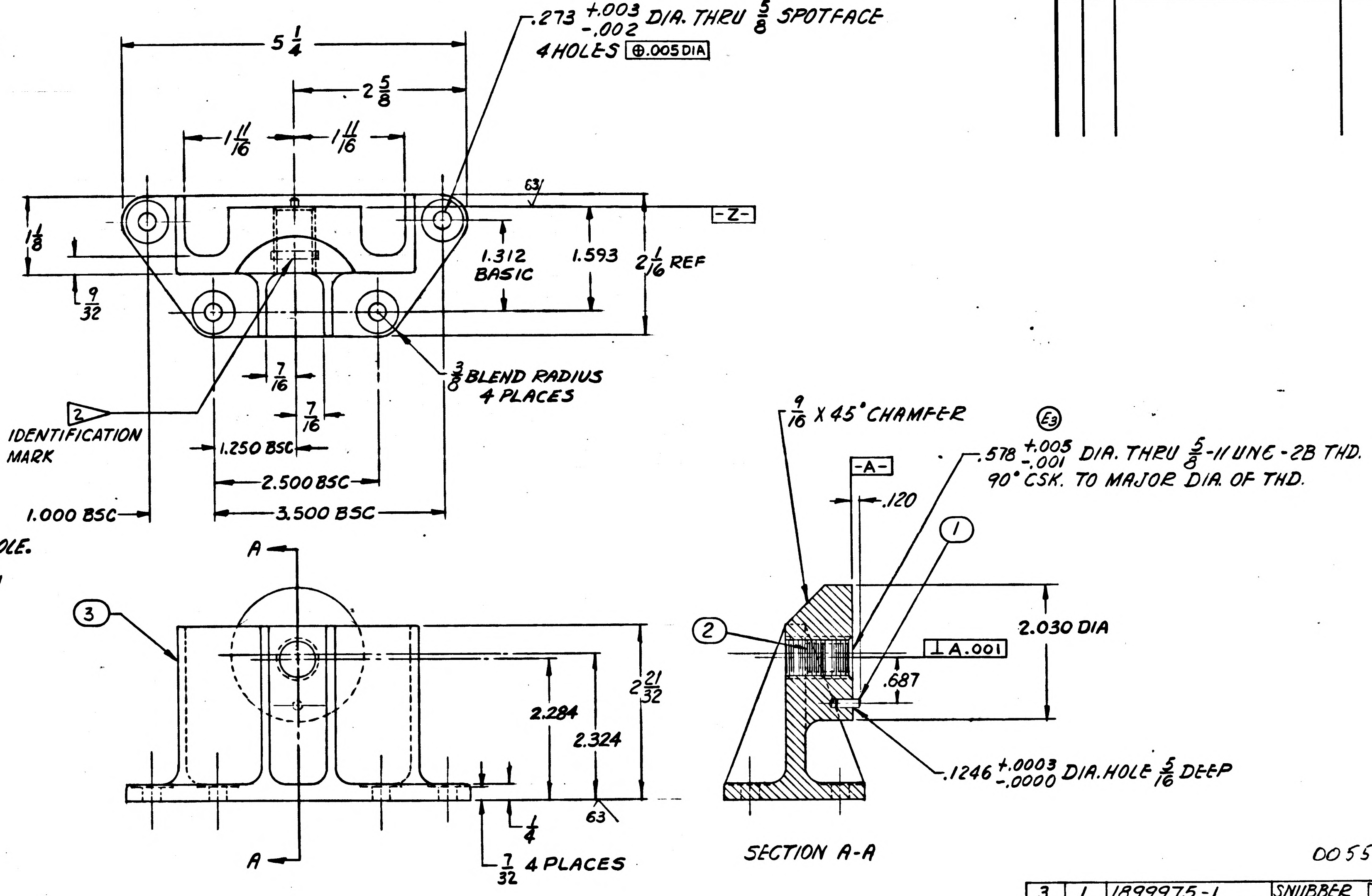
ALL WEB THICKNESS TO BE .100.

REMOVE BURRS & BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.

INSERT, ITEM ②, MUST BE .010 TO .030 BELOW SURFACE 'Z'.

(E4) FINISH: MIL-C-5541 CHEMICAL FILM EXCEPT THREADED HOLE.

▷2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.



.273 +.003 -.002 DIA. THRU 5/8 SPOTFACE
4 HOLES ⊕.005 DIA
5 1/4
2 5/8
1 11/16
1 11/16
63
-Z-
1 1/8
9/32
1.312 BASIC
1.593
2 1/16 REF
7/16
7/16
3/8 BLEND RADIUS 4 PLACES
▷2 IDENTIFICATION MARK
1.250 BSC
2.500 BSC
3.500 BSC
1.000 BSC
A
③
2.284
2.324
2 21/32
1/4
7/32 4 PLACES
63
A
9/16 X 45° CHAMFER
(E3)
.578 +.005 -.001 DIA. THRU 5/8-11 UNC-2B THD. 90° CSK. TO MAJOR DIA. OF THD.
-A-
.120
①
②
⊥ A .001
2.030 DIA
.687
.1246 +.0003 -.0000 DIA. HOLE 5/16 DEEP
SECTION A-A

00554 13 MAR 1963

3	1	1899975-1	SNUBBER ▷1
2	1	NAS 1395-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT
ITEM NO.	REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIAL

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+1°
$-\frac{1}{64}$	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL ▷1

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 2-26-63
CHECKED MALIKOWSKI 1 MAR 63
APPROVAL J. HANN 4 MAR 63
APPROVAL A. J. KODEL L.C. 4 MAR 63
NASA APPROVAL W. S. Swingle 13 Mar 1963
MIT APPROVAL R. [illegible] W. [illegible] 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899975
SCALE FULL
SHEET

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ D		UPGRADED FOR CLASS A RELEASE TDRR 01090		27 APR 63	A.J.F.
E4		REVISED IN ACCORDANCE WITH TDRR 01511		26 June 63	
F		REVISED IN ACCORDANCE WITH TDRR 02273		31 July 63	RWG

NOTES:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

(E1) 1 ALUMINUM ALLOY PER QQ-A-601 CL 356, COND. T51.

PRECISION CAST PER MIL-C-10005.

(E2)

INSPECT PER MIL-C-6021, CLASS IA.

UNLESS OTHERWISE SPECIFIED:

ALL FILLET 1/4 R.

SURFACE ROUGHNESS SHALL NOT EXCEED 125√.

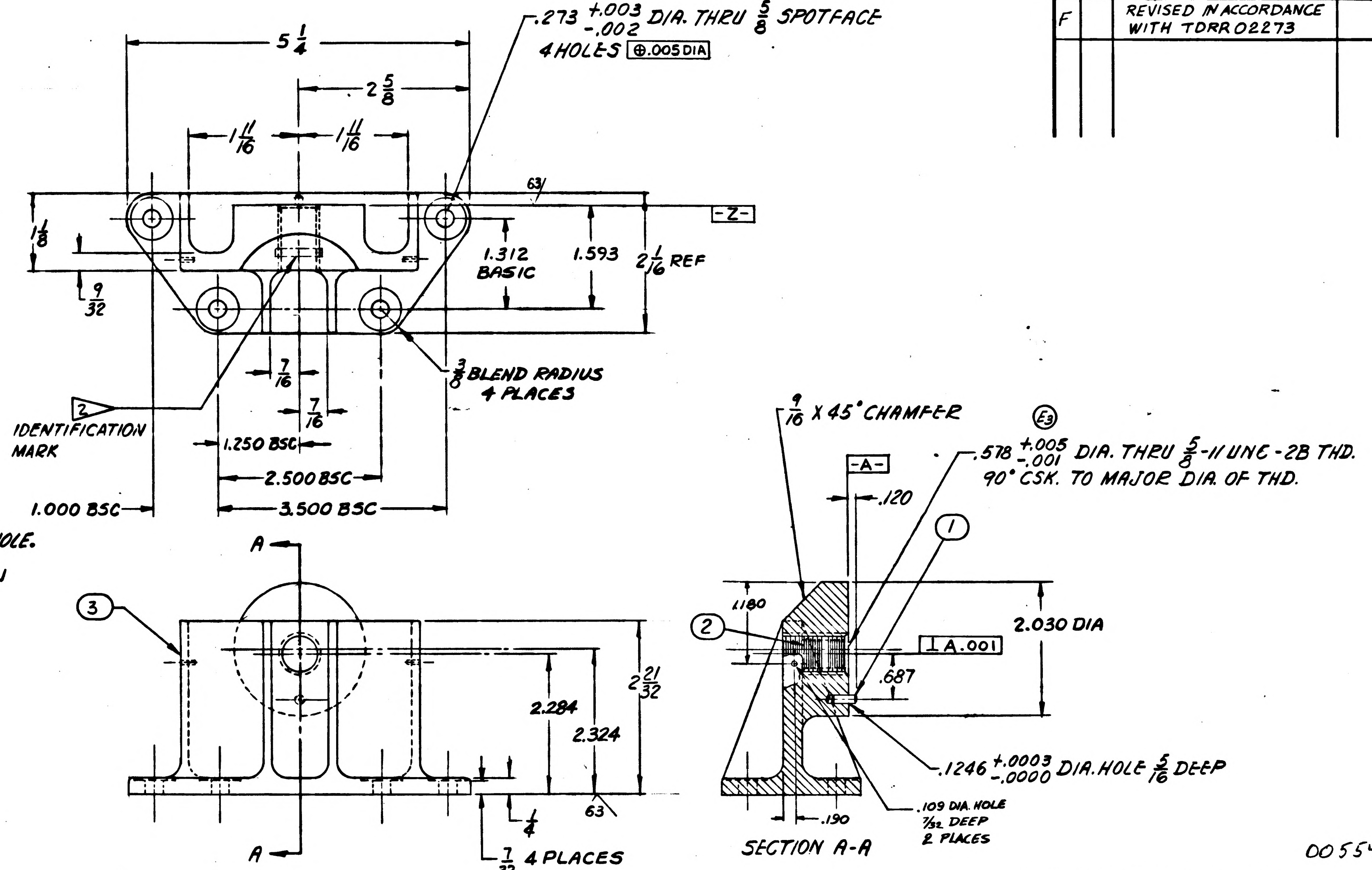
ALL WEB THICKNESS TO BE .100.

REMOVE BURRS & BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.

INSERT, ITEM ②, MUST BE .010 TO .030 BELOW SURFACE 'Z'.

(E4) FINISH: MIL-C-5541 CHEMICAL FILM EXCEPT THREADED HOLE.

2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.



5 1/4
2 5/8
1 11/16
1 11/16
.273 +.003 -.002 DIA. THRU 5/8 SPOTFACE 4 HOLES ⊕.005 DIA
63
-Z-
1 1/8
9/32
1.312 BASIC
1.593
2 1/16 REF
3/8 BLEND RADIUS 4 PLACES
7/16
7/16
2 IDENTIFICATION MARK
1.250 BSC
2.500 BSC
1.000 BSC
3.500 BSC
A
A
③
2.284
2.324
2 21/32
63
1/4
7/32 4 PLACES
9/16 X 45° CHAMFER
(E3)
.578 +.005 -.001 DIA. THRU 5/8-11 UNC-2B THD. 90° CSK. TO MAJOR DIA. OF THD.
-A-
.120
①
②
.180
⊥ A .001
.687
2.030 DIA
.1246 +.0003 -.0000 DIA. HOLE 5/16 DEEP
.109 DIA. HOLE 7/32 DEEP 2 PLACES
.190
SECTION A-A

00554 13 MAR 1963

3	1	1899975-1	SNUBBER 1
2	1	NAS 1395-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT
ITEM NO.	REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIAL

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL 1

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 2-26-63
MALIKOWSKI 1 MAR 63
CHECKED
APPROVAL J. HANN 4 MAR 63
APPROVAL A.J. KODEL L.C. 4 MAR 63
NASA APPROVAL W. S. Swinford 13 Mar 1963
R. Bass
MIT APPROVAL W. Kupfer 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO. SIZE D 1899975

SCALE FULL SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) D		UPGRADED FOR CLASS A RELEASE TDRR 01090		27 APR 63	A.J.F. / WK
(M) Eq		REVISED IN ACCORDANCE WITH TDRR 01511		26 June 63	WK
(M) F		REVISED IN ACCORDANCE WITH TDRR 02273		31 July 63	RWG / WK
G		REVISED IN ACCORDANCE WITH TDRR 02630		27 Aug 63	GDS / WK

NOTES:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

(E1) 1▷ ALUMINUM ALLOY PER QQ-A-601 CL 356, COND. T51.

PRECISION CAST PER MIL-C-11866.

(E2)

INSPECT PER MIL-C-6021, CLASS IA.

UNLESS OTHERWISE SPECIFIED:
ALL FILLET 1/4 R.

SURFACE ROUGHNESS SHALL NOT EXCEED 125√.

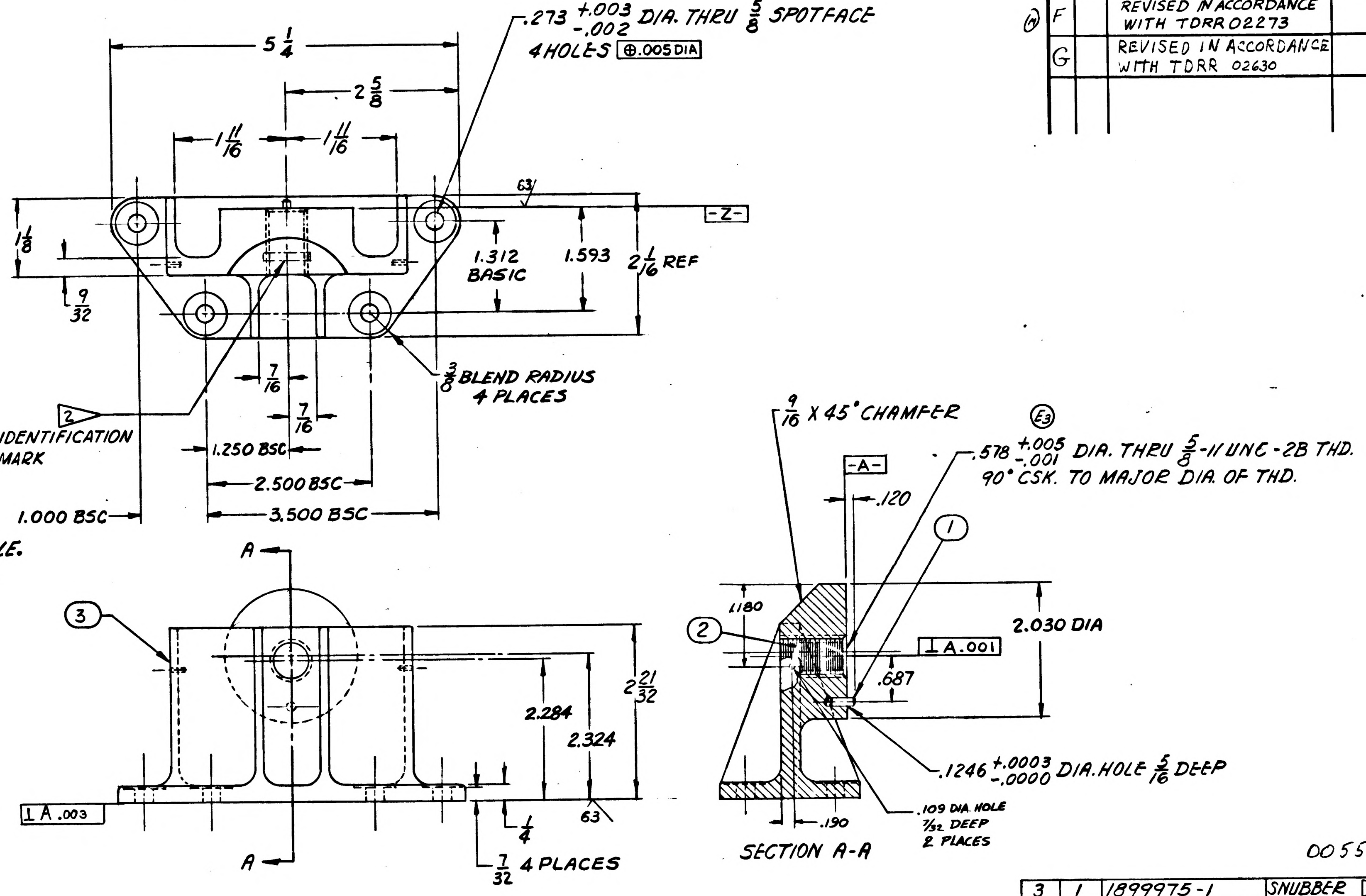
ALL WEB THICKNESS TO BE .100.

REMOVE BURRS & BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.

INSERT, ITEM ②, MUST BE .010 TO .030 BELOW SURFACE 'Z'.

(E4) FINISH: MIL-C-5541 CHEMICAL FILM EXCEPT THREADED HOLE.

2▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.



5 1/4
2 5/8
1 11/16
1 11/16
.273 +.003 -.002 DIA. THRU 5/8 SPOTFACE 4 HOLES ⊕.005 DIA
63
-Z-
1 1/8
9/32
1.312 BASIC
1.593
2 1/16 REF
3/8 BLEND RADIUS 4 PLACES
7/16
7/16
2▷ IDENTIFICATION MARK
1.250 BSC
2.500 BSC
3.500 BSC
1.000 BSC
A
A
③
2.284
2.324
2 21/32
⊥ A .003
63
1/4
7/32 4 PLACES
9/16 X 45° CHAMFER
(E3)
.578 +.005 -.001 DIA. THRU 5/8-11 UNC-2B THD. 90° CSK. TO MAJOR DIA. OF THD.
-A-
.120
①
.180
②
2.030 DIA
⊥ A .001
.687
.1246 +.0003 -.0000 DIA. HOLE 5/16 DEEP
.109 DIA HOLE 7/32 DEEP 2 PLACES
.190
SECTION A-A

00554 13 MAR 1963

ITEM NO.	REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	1899975-1	SNUBBER 1▷
2	1	NAS 1395-7L	INSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT

LIST OF PARTS AND MATERIAL

NEXT ASSY	USED ON
1899950-011	1899950-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING
MATERIAL 1▷
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 2-26-63
MALIKOWSKI 1 MAR 63
CHECKED
APPROVAL J. Hanna 4 MAR 63
APPROVAL A.J. KODEL L.C. 4 MAR 63
NASA APPROVAL W. J. Swim 13 Mar 1963
R. Bass
MIT APPROVAL W. Kupfer 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, REAR
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899975
SCALE FULL
SHEET

G 1899975 2

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1▷ ALUMINUM ALLOY PER QQ-A-601 CL 3M.

PRECISION CAST PER MIL-C-10005.

HEAT TREAT PER MIL-H-6088, COND T6.

INSPECT PER MIL-C-6021, CLASS IA.

2▷ MARK "1899975" IN $\frac{1}{8}$ CHARACTERS IN POSITION SHOWN PER MIL-STD-130.

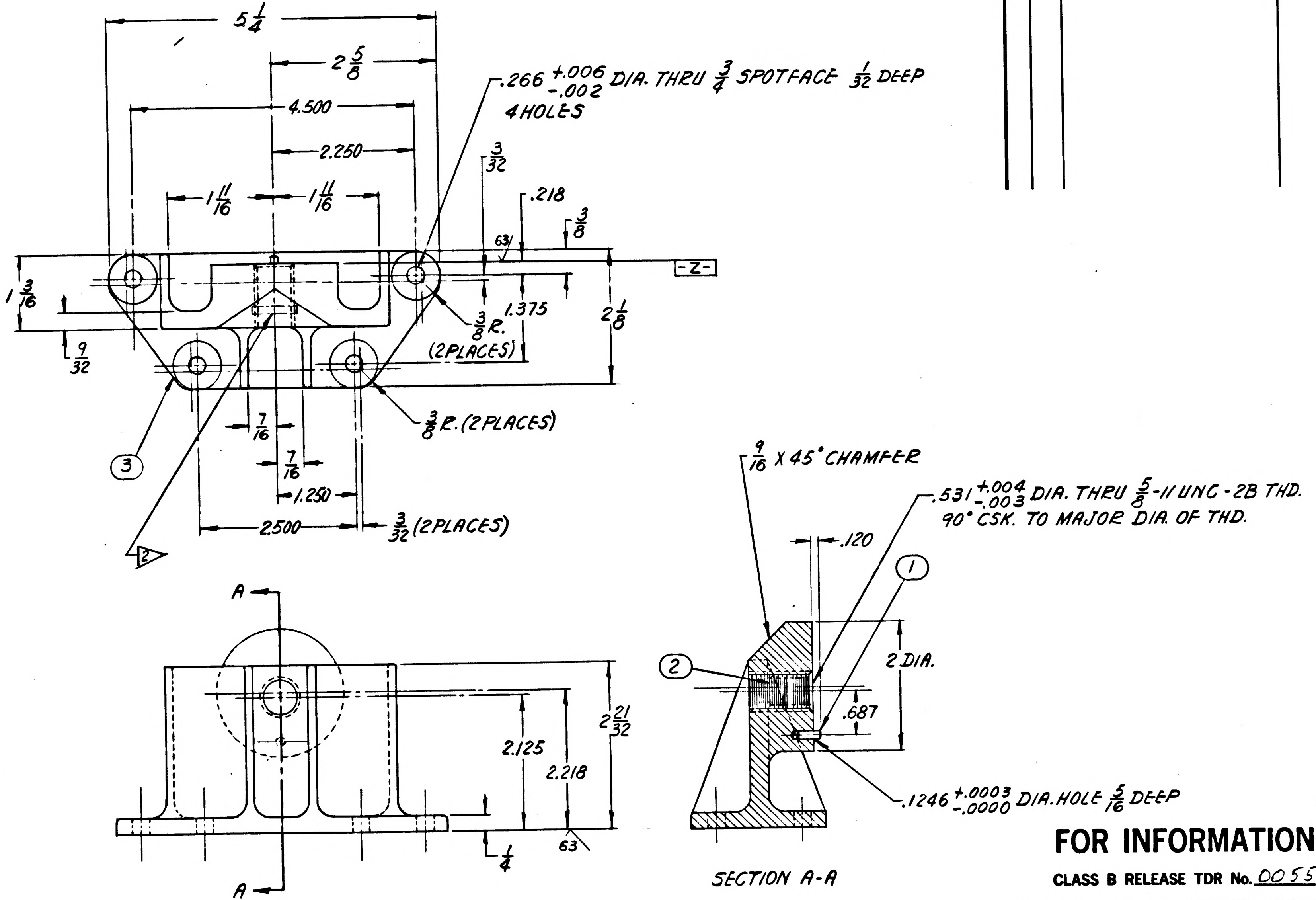
UNLESS OTHERWISE SPECIFIED:
ALL FILLET $\frac{1}{4}$ R.

SURFACE ROUGHNESS SHALL NOT EXCEED 125√.

ALL WEB THICKNESS TO BE .100.

REMOVE BURRS & BREAK SHARP EDGES .005 TO .015 RADIUS OR CHAMFER.

KEENSERT ITEM ② MUST BE .010 TO .030 BELOW SURFACE 'Z'.



$5\frac{1}{4}$
$2\frac{5}{8}$
4.500
2.250
$1\frac{11}{16}$
$1\frac{11}{16}$
$.266 {+.006 \atop -.002}$ DIA. THRU $\frac{3}{4}$ SPOTFACE $\frac{1}{32}$ DEEP 4 HOLES
$\frac{3}{32}$
.218
63
$\frac{3}{8}$
-Z-
$1\frac{3}{16}$
1.375
$2\frac{1}{8}$
$\frac{3}{8}$R. (2 PLACES)
$\frac{9}{32}$
$\frac{3}{8}$R. (2 PLACES)
$\frac{7}{16}$
$\frac{7}{16}$
1.250
2.500
$\frac{3}{32}$ (2 PLACES)
③
2▷
$\frac{9}{16}$ X 45° CHAMFER
$.531 {+.004 \atop -.003}$ DIA. THRU $\frac{5}{8}$-11 UNC-2B THD. 90° CSK. TO MAJOR DIA. OF THD.
.120
①
②
2 DIA.
.687
$.1246 {+.0003 \atop -.0000}$ DIA. HOLE $\frac{5}{16}$ DEEP
A
A
2.125
2.218
$2\frac{21}{32}$
$\frac{1}{4}$
63
SECTION A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00554 DATE 13 MAR 1963

ITEM NO.	REQD.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	1899975-1	SNUBBER 1▷
2	1	NAS 1395-7	KEENSERT, SELF-LOCKING
1	1	MS-16555-625	PIN-STRAIGHT

LIST OF PARTS AND MATERIAL

1899950	1899970
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+1°
$-\frac{1}{64}$	-.005	-1°

DO NOT SCALE THIS DRAWING
MATERIAL 1▷
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 2-26-63
CHECKED MALIKOWSKI 1 MAR 63
APPROVAL J. HANN 4 MAR 63
APPROVAL A.J. KODEL 4 MAR 63
NASA APPROVAL 13 Mar 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER REAR
(INSEP. ASSY.)

CODE IDENT NO.
SIZE D
1899975
SCALE FULL
SHEET

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) C		UPGRADED FOR CLASS A RELEASE TPPR 01073		27 APR 63	A.J.F. / WK

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

1▷ MATERIAL: STAINLESS STEEL, QQ-S-763, CLASS 303, COND A

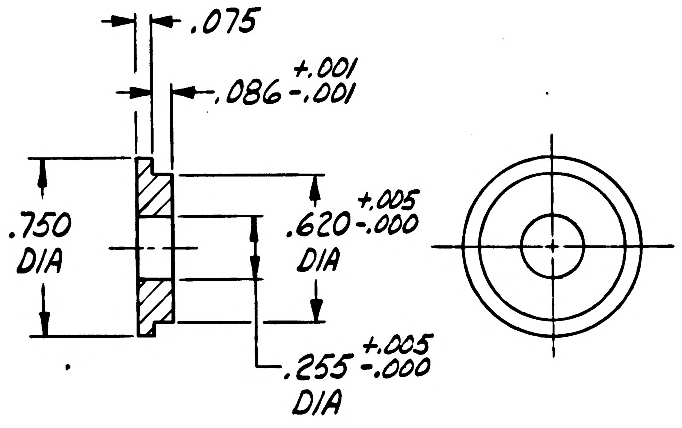
HEAT TREAT PER MIL-H-6875 PER 17-4-PH, CONDITION H-1150.

UNLESS OTHERWISE SPECIFIED:

- SURFACE ROUGHNESS MUST NOT EXCEED 125√
- INSIDE CORNERS .010 MAX.
- REMOVE SHARP EDGES .015 MAX.

PASSIVATE PER MIL-F-14072 (SIG C)
FINISH E-300

IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130



00554
13 MAR 63

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$, $-\frac{1}{64}$	+.005 -.005	+ – – –

DO NOT SCALE THIS DRAWING

MATERIAL 1▷

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN G. DeNICOLA DATE 2-22-63
MALIKOWSKI 28 FEB 63
CHECKED

APPROVAL J. HANN 4 MAR 63
APPROVAL A. J. KODEL L.C. 4 MAR 63

NASA APPROVAL W. S. [illegible] 1963
R. [illegible]
MIT APPROVAL [illegible] 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COLLAR, CENTERING

CODE IDENT NO.

SIZE C

1899976

SCALE 2:1

SHEET

MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

1 MATERIAL: STAINLESS STEEL, QQ-S-763, CLASS 303, COND A

D1

UNLESS OTHERWISE SPECIFIED:

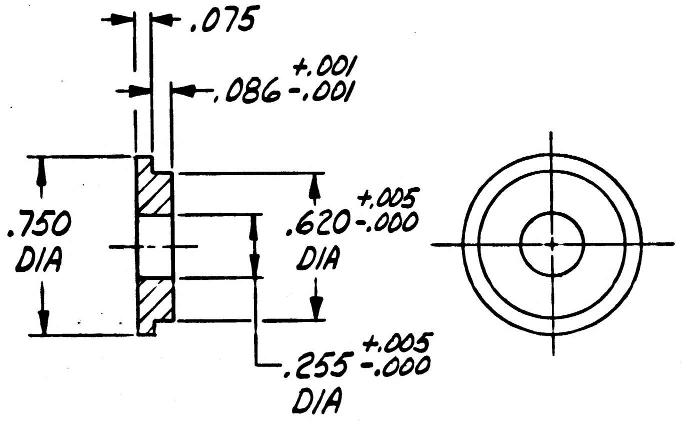
SURFACE ROUGHNESS MUST NOT EXCEED 125/.

INSIDE CORNERS .010 MAX.

REMOVE SHARP EDGES .015 MAX.

PASSIVATE PER MIL-F-14072 (SIG C) FINISH E-300

IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130



REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ C	-	UPGRADED FOR CLASS A RELEASE TPPR 01073		27 APR 63	A.J.F. / WK
D1		REVISED IN ACCORDANCE WITH TDRR 01512		7 June 63	WK

00554
13 MAR 63

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$, $-\frac{1}{64}$	+.005 -.005	+ - - -

DO NOT SCALE THIS DRAWING

MATERIAL 1

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

DRAWN G. DeNICOLA DATE 2-22-63
CHECKED MALIKOWSKI 28 FEB 63
APPROVAL J. HANN 4 MAR 63
APPROVAL A. J. KODEL L.C. 4 MAR 63
NASA APPROVAL W. J. Smith 13 March 1963
R. Bass
MIT APPROVAL W. Kupfer 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COLLAR, CENTERING

CODE IDENT NO.
SIZE C
1899976
SCALE 2:1
SHEET

MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

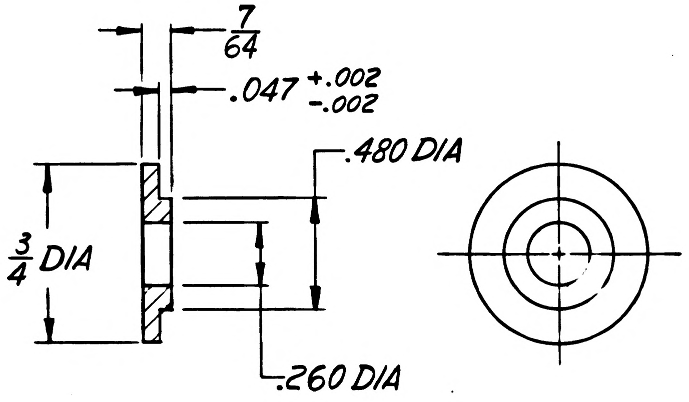
MATERIAL: STAINLESS STEEL, BAR QQ-S-763, CLASS 303, COND A

UNLESS OTHERWISE SPECIFIED:

SURFACE ROUGHNESS MUST NOT EXCEED 125/

INSIDE CORNERS .010 MAX.

REMOVE SHARP EDGES .015 MAX.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00554 DATE 13MAR63

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
		FRACTIONS +1/64, -1/64 DECIMALS +.005, -.005 ANGLES + –, – –	ACSP PN	COLLAR, CENTERING	
			DRAWN G. DeNicola DATE 2-22-63		
			CHECKED MALIKOWSKI 28 FEB 63		
			APPROVAL J. HANN 4 MAR 63		
		DO NOT SCALE THIS DRAWING	APPROVAL A. J. Kodel L.C. 4 MAR 63		
1899950	1899966	MATERIAL SEE NOTE	NASA APPROVAL W. S. [illegible] 13 March 1963	CODE IDENT NO.	SIZE C	1899976
NEXT ASSY	USED ON				
APPLICATION		CONTRACT	MIT APPROVAL W. [illegible] 13 Mar 63	SCALE 2:1		SHEET

1899976

MIL 1077C—P

INCHES

0 1 2

PHOTOGRAPHIC SCALE ONLY

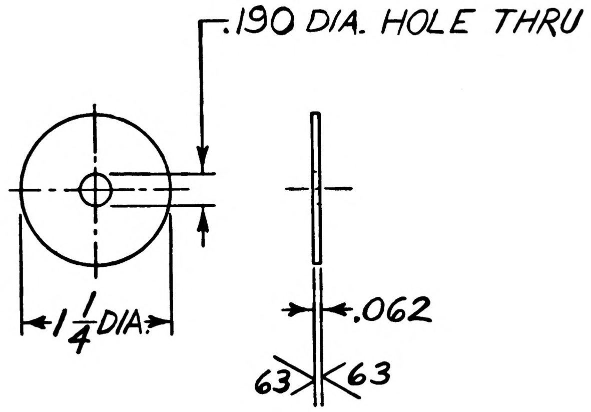
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

NOTES

UNLESS OTHERWISE SPECIFIED:
SURFACE ROUGHNESS TO BE 125√
REMOVE SHARP EDGES .015 MAX.

MATERIAL: STAINLESS STEEL, BAR
PER QQ-S-763 CLASS 324

HEAT TREAT PER MIL-H-6875 PER 17-4 PH COND H900
INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00554 DATE 13 MAR 63

NEXT ASSY: 1899950	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
USED ON: 1899966	FRACTIONS $\pm\frac{1}{64}$ DECIMALS $\pm.005$ ANGLES ±—	ACSP PN	WASHER	
APPLICATION	DO NOT SCALE THIS DRAWING	DRAWN E.C. Jones DATE 25 FEB 63		
	MATERIAL SEE NOTE	CHECKED MALIKOWSKI 26 FEB 63		
		APPROVAL J. HANN 4 MAR 63		
		APPROVAL A.J. KODEL L.C. 4 MAR 63		
		NASA APPROVAL 13 Mar 63	CODE IDENT NO.	SIZE C
	CONTRACT	MIT APPROVAL 13 Mar 63	SCALE 1/1	1899977 SHEET

MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1899978

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		UPGRADED FOR CLASS A RELEASE TDRR 01091		27 APR. 63	

NOTES;

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1▷ ALUM. ALLOY PER QQ-A-601 CL-356 COND T51

PRECISION CAST PER MIL-C-10005.

HEAT TREAT PER MIL-H-6088, COND T6.

INSPECT PER MIL-C-6021, CLASS IA.

2▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED 125√ CAST FINISH.

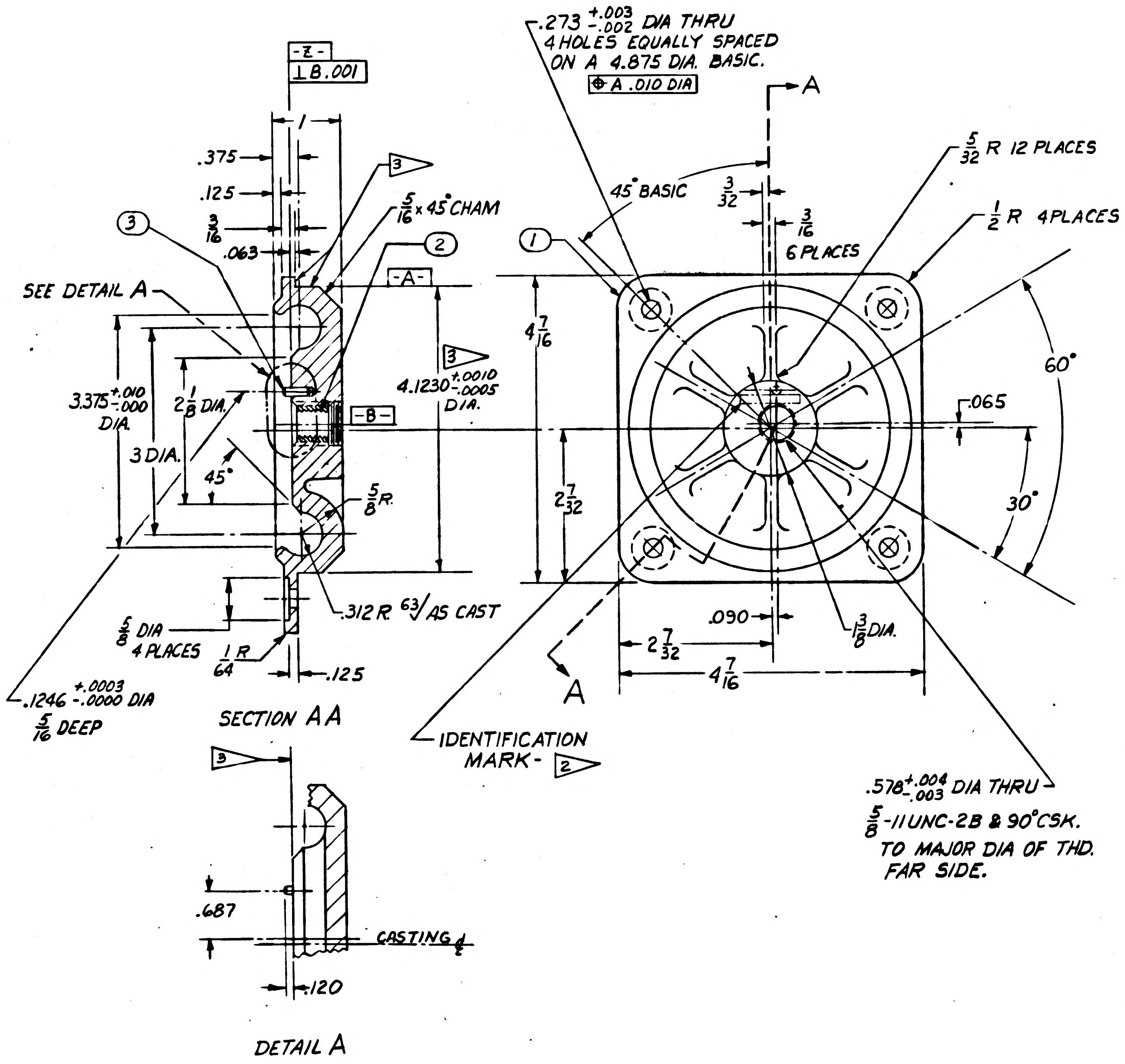
3▷ MACHINED SURFACES ROUGHNESS MUST NOT EXCEED 63√.

MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.

PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

FINISH: MIL-C-5541 CHEM. FILM


-Z-
⊥B.001
1
.375
.125
3/16
.063
3▷
5/16 x 45° CHAM
③
②
①
SEE DETAIL A
-A-
-B-
3.375 +.010 -.000 DIA.
2 1/8 DIA.
3 DIA.
45°
3▷
4.1230 +.0010 -.0005 DIA.
5/8 R.
.312 R. 63√ AS CAST
5/8 DIA 4 PLACES
1/64 R
.125
.1246 +.0003 -.0000 DIA
5/16 DEEP
SECTION AA
3▷
.687
CASTING ℄
.120
DETAIL A
.273 +.003 -.002 DIA THRU
4 HOLES EQUALLY SPACED
ON A 4.875 DIA. BASIC.
⊕ A .010 DIA
A
45° BASIC
3/32
3/16
6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
4 7/16
60°
.065
2 7/32
30°
.090
2 7/32
4 7/16
1 3/8 DIA.
A
IDENTIFICATION MARK - 2▷
.578 +.004 -.003 DIA THRU
5/8-11UNC-2B & 90° CSK.
TO MAJOR DIA OF THD.
FAR SIDE.

00697 3 APR 63

ITEM NO	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	MS-16555-625	PIN-STRAIGHT 1▷
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	1899978-1	SNUBBER R.H

LIST OF PARTS AND MATERIAL

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+.005 -.005	+1/64 -1/64	+1° -1°

DO NOT SCALE THIS DRAWING

MATERIAL 1▷

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN Bob KARLING DATE 3-27-63
CHECKED 1 APR 63
APPROVAL J. HANN 4-1-63
APPROVAL 1 APR. 63
NASA APPROVAL
MIT APPROVAL R. Dras 3 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, FRONT, RIGHT HAND
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.	SIZE	
	D	1899978
SCALE 1:1		SHEET

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899978 E

NOTES ;

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1▷ ALUM. ALLOY PER QQ-A-601 CL-356 COND T51

PRECISION CAST PER MIL-C-10005.

(E4)

INSPECT PER MIL-C-6021, CLASS IA.

2▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED :

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED 125√ CAST FINISH.

3▷ MACHINED SURFACES ROUGHNESS MUST NOT EXCEED 63√.

MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.

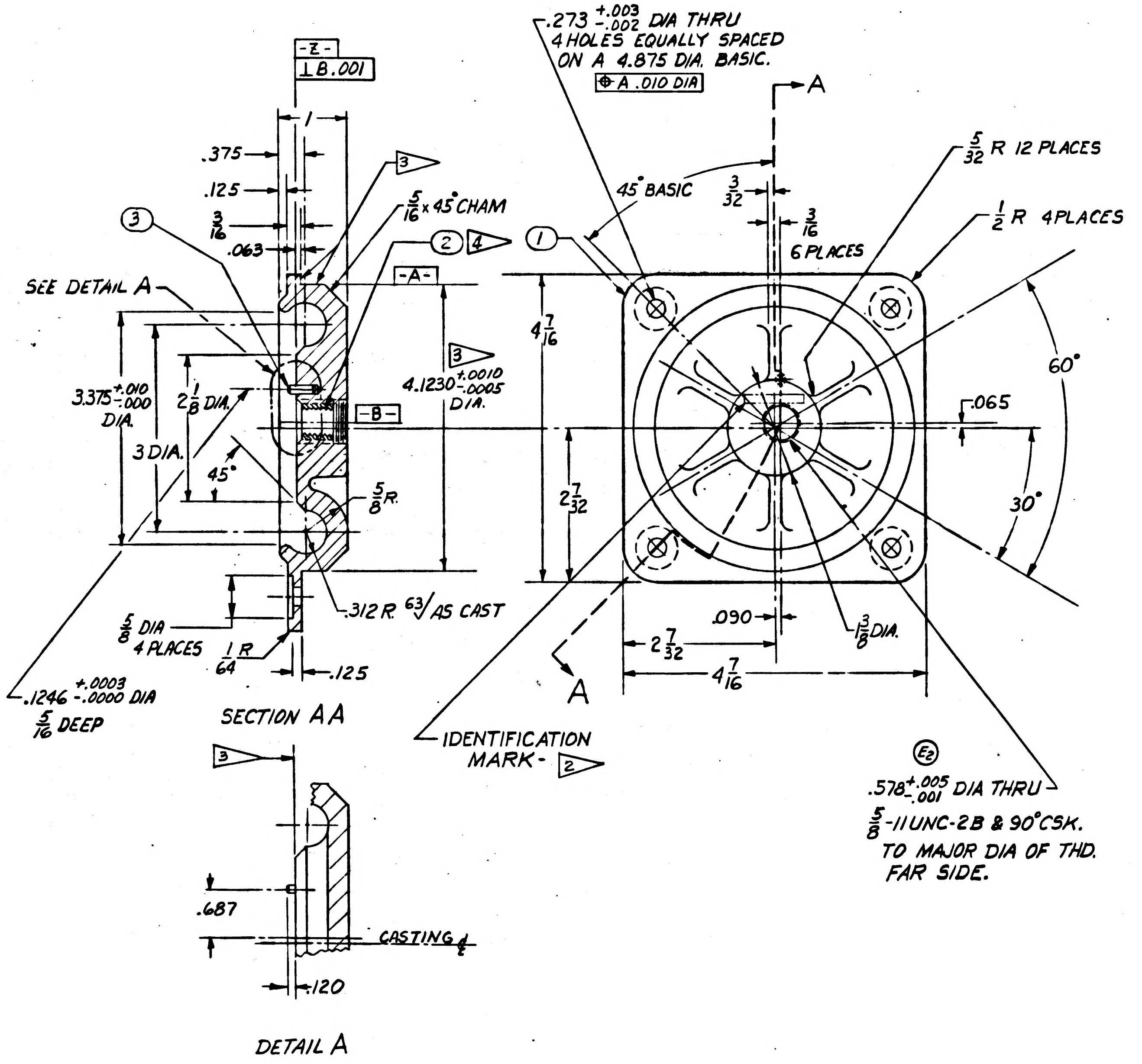
PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

(E3)

4▷ INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

FINISH: MIL-C-5541 CHEM. FILM, EXCEPT THREADED HOLE.

(E5)


-Z-
⊥ B .001
1
.375
.125
3/16
.063
3▷
5/16 x 45° CHAM
③
② 4▷
①
-A-
SEE DETAIL A
3.375 +.010 -.000 DIA.
2 1/8 DIA.
3 DIA.
45°
3▷
4.1230 +.0010 -.0005 DIA.
-B-
5/8 R.
5/8 DIA 4 PLACES
1/64 R
.125
.312 R. 63√ AS CAST
.1246 +.0003 -.0000 DIA 5/16 DEEP
SECTION AA
3▷
.687
CASTING ℄
.120
DETAIL A
.273 +.003 -.002 DIA THRU 4 HOLES EQUALLY SPACED ON A 4.875 DIA. BASIC.
⌖ A .010 DIA
A
A
45° BASIC
3/32
3/16 6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
4 7/16
2 7/32
60°
.065
30°
.090
2 7/32
4 7/16
1 3/8 DIA.
IDENTIFICATION MARK - 2▷
(E2)
.578 +.005 -.001 DIA THRU
5/8-11UNC-2B & 90° CSK. TO MAJOR DIA OF THD. FAR SIDE.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS A RELEASE TDRR 01091		27 APR. 63	A.J.F. / Wk
E5		REVISED IN ACCORDANCE WITH TDRR 01513		June 63	Wk

(M)

00697 3 APR 63

ITEM NO	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	MS-16555-625	PIN-STRAIGHT 1▷
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	1899978-1	SNUBBER R.H

LIST OF PARTS AND MATERIAL

(E1)

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL 1▷

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bob KARLING DATE 3-27-63
CHECKED W. Duchl 1 APR 63
APPROVAL J. HANN 4-1-63
APPROVAL 1 APR. 63
NASA APPROVAL
R. Bras
MIT APPROVAL 3 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, FRONT, RIGHT HAND
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899978
SCALE 1:1
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899978 E

NOTES;

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 ALUM. ALLOY PER QQ-A-601 CL-356 COND T51

PRECISION CAST PER MIL-C-10005.

(E4)

INSPECT PER MIL-C-6021, CLASS IA.

2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED 125√ CAST FINISH.

3 MACHINED SURFACES ROUGHNESS MUST NOT EXCEED 63√.

MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.

PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

(E3)

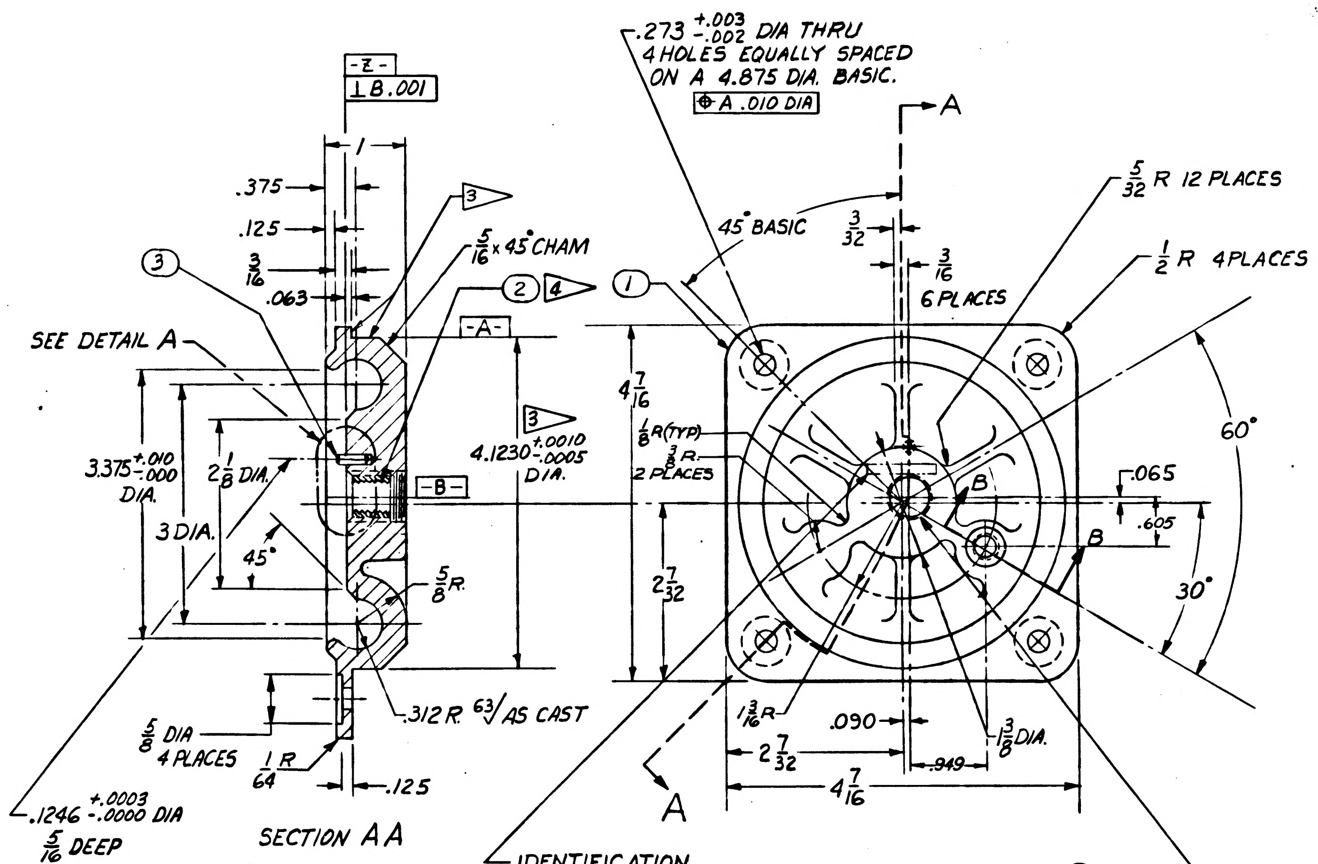
4 INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

FINISH: MIL-C-5541 CHEM. FILM, EXCEPT THREADED HOLE.

(E5)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		UPGRADED FOR CLASS A RELEASE TDRR 01091		27 APR. 63	A.J.F.
E5		REVISED IN ACCORDANCE WITH TDRR 01513		63	
F		REVISED IN ACCORDANCE WITH TDRR 01974		18 JULY 63	C.R.G. Wk

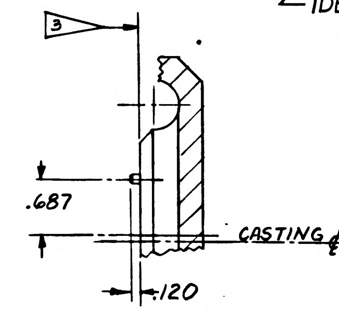
(M)



-Z-
⊥ B .001
.375
.125
3/16
.063
1
3
5/16 x 45° CHAM
2 4
1
-A-
SEE DETAIL A
3
4.1230 +.0010 -.0005 DIA.
3.375 +.010 -.000 DIA.
2 1/8 DIA.
3 DIA.
45°
-B-
5/8 R.
5/8 DIA 4 PLACES
1/64 R
.312 R 63/ AS CAST
.125
.1246 +.0003 -.0000 DIA 5/16 DEEP
SECTION AA
.273 +.003 -.002 DIA THRU 4 HOLES EQUALLY SPACED ON A 4.875 DIA. BASIC.
⊕ A .010 DIA
A
45° BASIC
3/32
3/16 6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
4 7/16
1/8 R (TYP)
3/8 R. 2 PLACES
B
.065
.605
B
60°
30°
2 7/32
1 3/16 R
.090
1 3/8 DIA.
2 7/32
.949
4 7/16
A
IDENTIFICATION MARK- 2

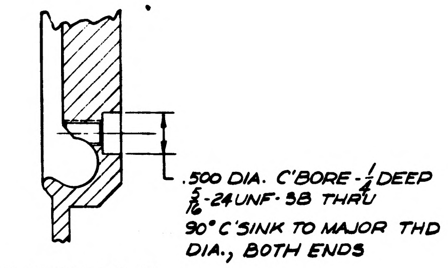
(E2)

.578 +.005 -.001 DIA THRU
5/8-11UNC-2B & 90° CSK. TO MAJOR DIA OF THD. FAR SIDE.



3
.687
CASTING ℄
.120

DETAIL A



.500 DIA. C'BORE - 1/4 DEEP
5/16-24UNF-3B THRU
90° C'SINK TO MAJOR THD DIA., BOTH ENDS

SECTION B-B

00697 3 APR 63

3	1	MS-16555-625	PIN-STRAIGHT 1
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	1899978-1	SNUBBER R.H
ITEM NO	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIAL

(E1)

1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES +1° -1°
DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bob KARLING DATE 3-27-63
CHECKED W. Duchl 1 APR 63
APPROVAL J. HANN 4-1-63
APPROVAL A.Kodel 1 APR. 63
NASA APPROVAL R Bnas
MIT APPROVAL 3 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER, FRONT, RIGHT HAND
(INSEPARABLE)
ASSEMBLY

CODE IDENT NO.
SIZE D
1899978
SCALE 1:1
SHEET

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

8	7	6	5	4	3	G 1899978 2 1

NOTES;

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 ALUM. ALLOY PER QQ-A-601 CL-356 COND T51

PRECISION CAST PER MIL-C-10005.

(E4)

INSPECT PER MIL-C-6021, CLASS IA.

2 IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED 125√ CAST FINISH.

3 MACHINED SURFACES ROUGHNESS MUST NOT EXCEED 63√.

(G1) MACHINED CORNERS MUST BE 1/32 R OR CHAMFER.

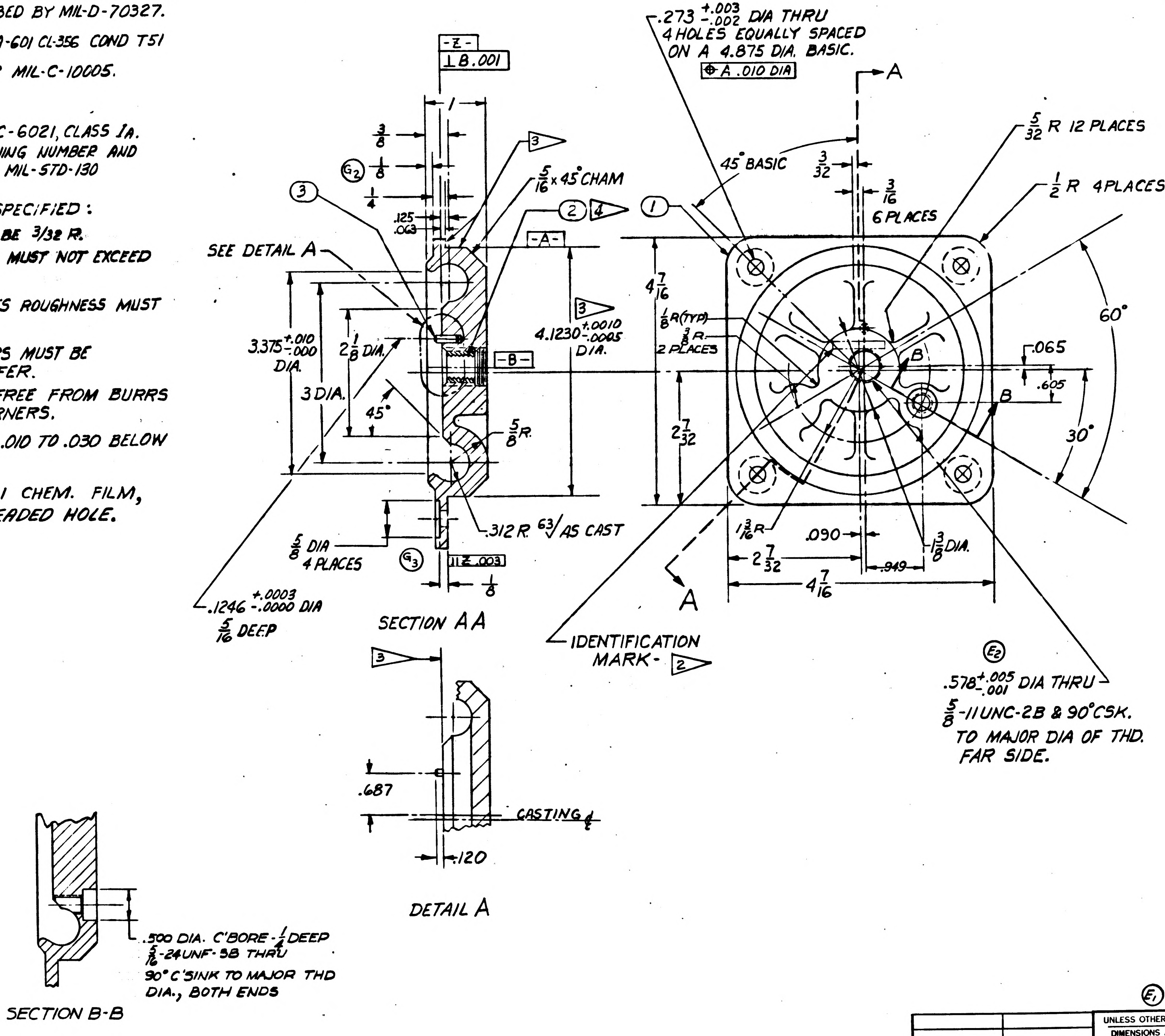
PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

(E3)

4 INSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

FINISH: MIL-C-5541 CHEM. FILM, EXCEPT THREADED HOLE.

(E5)



-Z-
⊥ B .001
3/8
(G2) 1/8
1/4
.125
.063
1
3
5/16 x 45° CHAM
(3)
(2) 4
SEE DETAIL A
-A-
3.375 +.010 -.000 DIA.
2 1/8 DIA.
3 DIA.
45°
-B-
3
4.1230 +.0010 -.0005 DIA.
5/8 R.
.312 R. 63/ AS CAST
5/8 DIA 4 PLACES
(G3)
11 Z .003
1/8
.1246 +.0003 -.0000 DIA
5/16 DEEP
SECTION AA
.273 +.003 -.002 DIA THRU
4 HOLES EQUALLY SPACED
ON A 4.875 DIA. BASIC.
⊕ A .010 DIA
A
45° BASIC
3/32
3/16
6 PLACES
5/32 R 12 PLACES
1/2 R 4 PLACES
(1)
4 7/16
1/8 R (TYP)
3/8 R
2 PLACES
60°
.065
.605
B
B
30°
2 7/32
1 3/16 R
.090
1 3/8 DIA.
2 7/32
.949
4 7/16
A
IDENTIFICATION MARK - 2
(E2)
.578 +.005 -.001 DIA THRU
5/8 -11UNC-2B & 90° CSK.
TO MAJOR DIA OF THD.
FAR SIDE.
3
.687
CASTING ℄
.120
DETAIL A
.500 DIA. C'BORE - 1/4 DEEP
5/16 -24UNF-3B THRU
90° C'SINK TO MAJOR THD DIA., BOTH ENDS
SECTION B-B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
(M) D		UPGRADED FOR CLASS A RELEASE TDRR 01091		27 APR. 63	A.J.F. / WK
E5		REVISED IN ACCORDANCE WITH TDRR 01513		4 June 63	WK
F		REVISED IN ACCORDANCE WITH TDRR 01974		18 JULY 63	C.R.G. WK
G3		REVISED PER TDRR NO. 03100			WK 9/19/63

00697 3 APR 63

3	1	MS-16555-625	PIN-STRAIGHT 1
2	1	NAS 1395C-7L	INSERT, SELF-LOCKING
1	1	1899978-1	SNUBBER R.H
ITEM NO	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
LIST OF PARTS AND MATERIAL			

(E1)

1899950-011 NEXT ASSY	1899950-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES +1° -1° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN Bob KARLING DATE 3-27-63 CHECKED W. Diehl 1 APR 63 APPROVAL J. HANN 4-1-63 APPROVAL [illegible] 1 APR. 63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS SNUBBER, FRONT, RIGHT HAND (INSEPARABLE) ASSEMBLY
APPLICATION		MATERIAL 1 CONTRACT NAS9-497	NASA APPROVAL [illegible] R. Bross MIT APPROVAL [illegible] 3 Apr 63	CODE IDENT NO. SIZE D 1899978 SCALE 1:1 SHEET

8	7	6	5	4	3	2	1

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO.	DATE	APPD.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

▷1 ALUM. ALLOY PER QQ-A-601 CL-356 COND T51

PRECISION CAST PER MIL-C-10005.

HEAT TREAT PER MIL-H-6088, COND T6.

INSPECT PER MIL-C-6021, CLASS IA.

▷2 MARK 1899978 IN 1/8 HIGH CHARACTERS IN POSITION SHOWN PER MIL-STD-130

UNLESS OTHERWISE SPECIFIED:

ALL CAST RADII TO BE 3/32 R.

SURFACE ROUGHNESS MUST NOT EXCEED 125√ CAST FINISH.

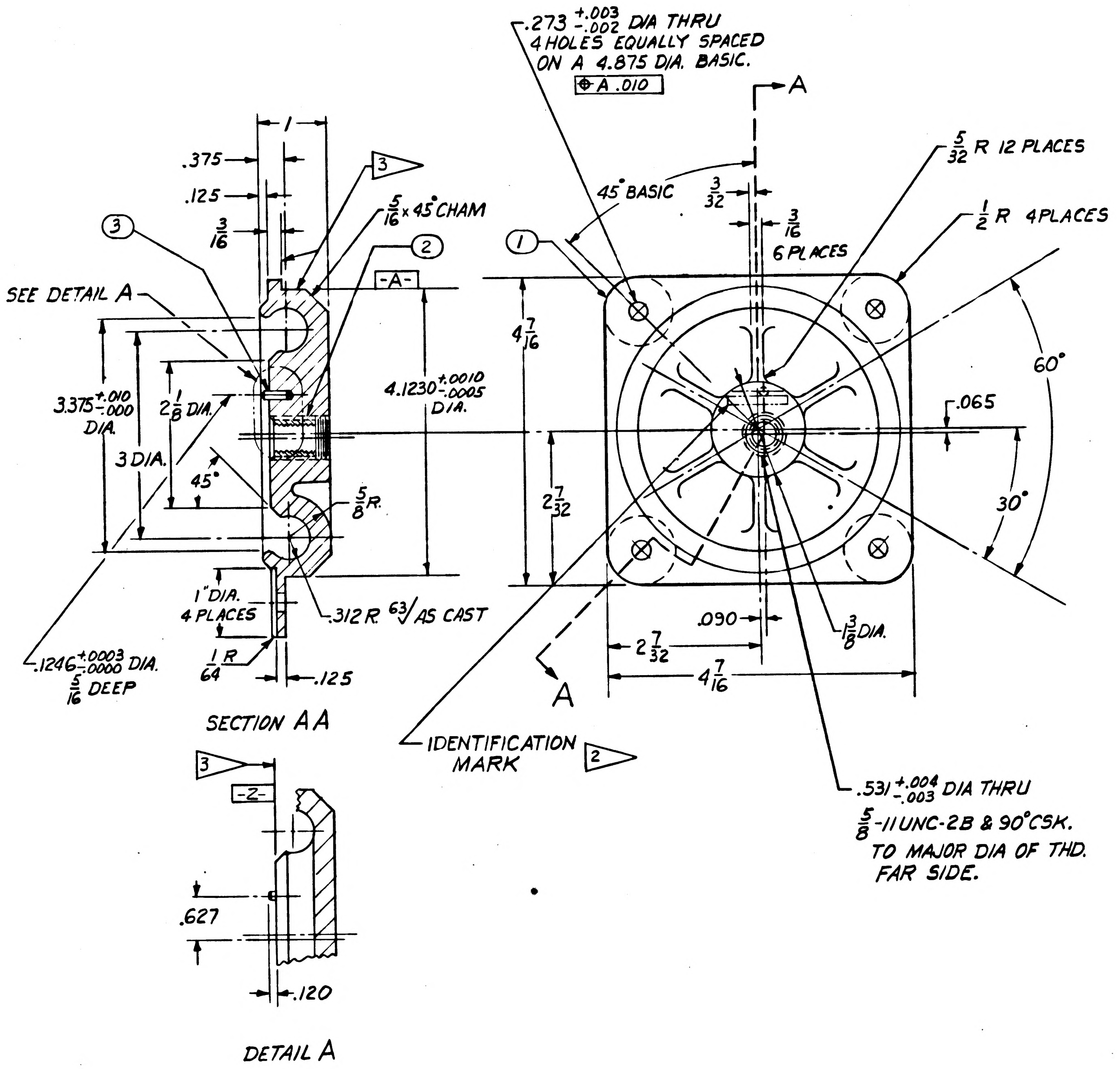
▷3 MACHINED SURFACES ROUGHNESS MUST NOT EXCEED 63√.

MACHINED CORNERS MUST BE .005 TO .015 R OR CHAMFER.

PARTS MUST BE FREE FROM BURRS AND SHARP CORNERS.

KEENSERT MUST BE .010 TO .030 BELOW SURFACE "Z".

FINISH: MIL-C-5541 CHEM. FILM



.273 +.003 -.002 DIA THRU
4 HOLES EQUALLY SPACED
ON A 4.875 DIA. BASIC.
⊕ A .010
A
5/32 R 12 PLACES
1/2 R 4 PLACES
45° BASIC
3/32
3/16
6 PLACES
①
60°
.065
30°
4 7/16
2 7/32
.090
2 7/32
4 7/16
1 3/8 DIA.
A
IDENTIFICATION MARK ▷2
.531 +.004 -.003 DIA THRU
5/8-11UNC-2B & 90° CSK.
TO MAJOR DIA OF THD.
FAR SIDE.
1
.375
.125
3/16
③
▷3
5/16 x 45° CHAM
②
-A-
SEE DETAIL A
3.375 +.010 -.000 DIA.
2 1/8 DIA.
3 DIA.
45°
4.1230 +.0010 -.0005 DIA.
5/8 R.
1" DIA. 4 PLACES
.312 R 63√ AS CAST
1/64 R
.125
.1246 +.0003 -.0000 DIA. 5/16 DEEP
SECTION AA
▷3
-Z-
.627
.120
DETAIL A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00697 **DATE** 3 APR 63

ITEM NO	REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3	1	MS-16555-625	PIN-STRAIGHT ◁1
2	1	NAS 1395-7	KEENSERT, SELF-LOCKING
1	1	1899978-1	SNUBBER R.H

LIST OF PARTS AND MATERIAL

NEXT ASSY	USED ON
1899950	1899970

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +.005 -.005 DECIMALS +1/64 -1/64 ANGLES +1° -1°
DO NOT SCALE THIS DRAWING
MATERIAL ▷1
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Bob KARLING DATE 3-27-63
CHECKED W. Diehl 1 APR 63
APPROVAL J. HANN 4-1-63
APPROVAL 1 APR 63
NASA APPROVAL
MIT APPROVAL 3 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SNUBBER-FRONT, RIGHT HAND
(INSEP ASSY)

CODE IDENT NO.
SIZE D
1899978
SCALE 1:1
SHEET

MIL 1077D—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS TDRR01075					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		UPGRADED FOR CLASS "A" RELEASE T	—	27 APR 63	WF.

REQUIREMENTS:

1 MATERIAL: SPRING STEEL SAE 1075 OR MAY BE MADE FROM 1010403-011

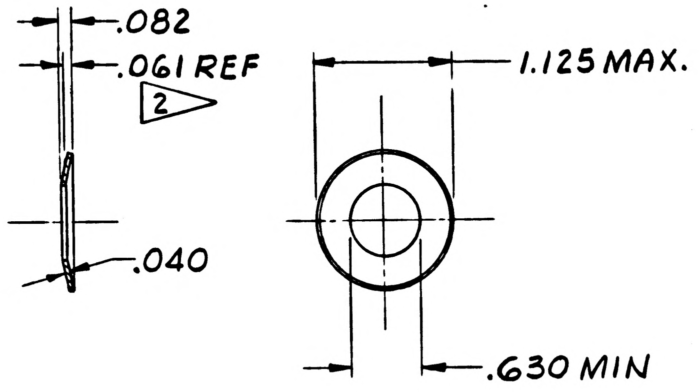
FINISH: ELECTROLESS SILVER PER ND 1002131.

CALCULATED LOAD AT FLAT POSITION: 330 LBS.

2 CALCULATED LOAD AT COMPRESSION TO .061: 230 ±10% LBS.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING Nº AND REVISION LETTER PER MIL-STD-130.



1899950-011	1899950-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN Frieder DATE 27 APR 63 CHECKED Mal Lawson 27 APR 63 APPROVAL Demati 27 APR 63 APPROVAL AKodal 27 APR 63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS WASHER-SPRING BELLEVILLE TYPE
NEXT ASSY	USED ON	DO NOT SCALE THIS DRAWING		
APPLICATION		MATERIAL 1	NASA APPROVAL W J Rhine 5-1-63 R. Gas MIT APPROVAL W Kupfer 1 May 63	CODE IDENT NO. SIZE C 1899979 SCALE 1:1 SHEET
		CONTRACT NAS-9-497		

MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS TDRR 01075

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		UPGRADED FOR CLASS "A" RELEASE T	—	27 APR 63	WF
B		REVISED IN ACCORDANCE WITH TDRR 01975			23 July 63 W

REQUIREMENTS:

▷1 MATERIAL: SPRING STEEL SAE 1075 OR MAY BE MADE FROM 1010403-011.

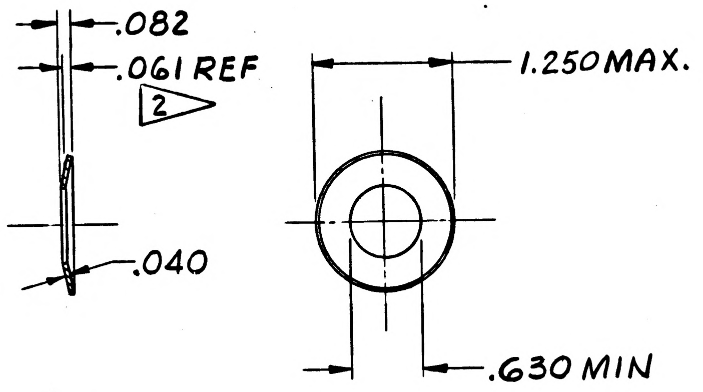
FINISH: ELECTROLESS SILVER PER ND 1002131.

CALCULATED LOAD AT FLAT POSITION: 330 LBS.

▷2 CALCULATED LOAD AT COMPRESSION TO .061: 230 ±10% LBS.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING № AND REVISION LETTER PER MIL-STD-130.



1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL ▷1
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Frieder DATE 27 APR 63
CHECKED Mel Lawson 27 APR 63
APPROVAL 27 APR 63
APPROVAL AKolde 27 APR 63
NASA APPROVAL W J Rhine 5-1-63
R. Bass
MIT APPROVAL W Kupfer 1 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

WASHER-SPRING
BELLEVILLE TYPE

CODE IDENT NO.
SIZE C
1899979
SCALE 1:1
SHEET

MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS TDRR 01075

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		UPGRADED FOR CLASS "A" RELEASE T	—	27 APR 63	WF
Ⓜ B		REVISED IN ACCORDANCE WITH TDRR 01975			23 July 63
C₇		REVISED PER ~~TDRR~~ NO. 03676		21 OCT 63	WK

REQUIREMENTS:

1▷ MATERIAL: SPRING STEEL SAE 1075 OR MAY BE MADE FROM 1010403-011

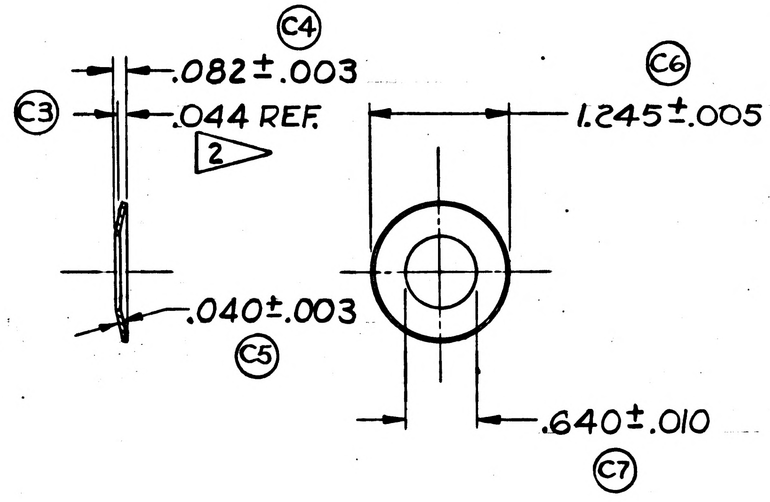
FINISH: ELECTROLESS SILVER PER ND 1002131.

Ⓒ1

Ⓒ2 2▷ LOAD AT COMPRESSION TO [FREE HEIGHT-0.9(FREE HEIGHT-THICKNESS)]; 300 LBS MIN TO 400 LBS MAX.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING № AND REVISION LETTER PER MIL-STD-130.



1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL 1▷
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Frieder 27 APR 63
CHECKED Kowalski DATE 27 APR 63
APPROVAL 27 APR 63
APPROVAL 27 APR 63
NASA APPROVAL W. J. Rhine 5-1-63
R. Bass
MIT APPROVAL 1 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

WASHER-SPRING
BELLEVILLE TYPE

CODE IDENT NO.
SIZE C
1899979
SCALE 1:1
SHEET 1 OF 1

MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS TDRR 01075

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ A		UPGRADED FOR CLASS "A" RELEASE T	—	27 APR 63	WF
Ⓜ B		REVISED IN ACCORDANCE WITH TDRR 01975			23/July/63 WH
Ⓜ C7		REVISED PER TDRR NO. 03676		21 OCT 63	WH
D		REVISED PER TDRR NO. 04951.		10 DEC. 63	

REQUIREMENTS:

1▷ MATERIAL: SPRING STEEL SAE 1075 OR MAY BE MADE FROM 1010403-011

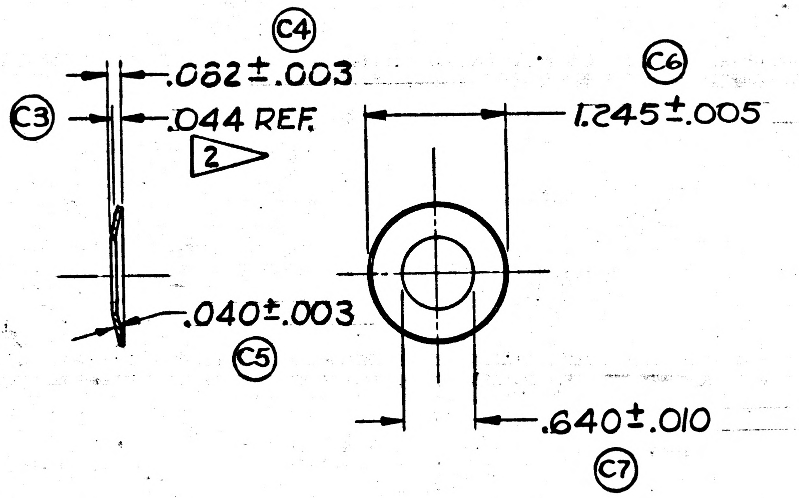
FINISH: ELECTROLESS NICKEL PER MIL-C-26074, CLASS 1, .0004 TO .0007 THICK.

Ⓒ1

Ⓒ2 2▷ LOAD AT COMPRESSION TO [FREE HEIGHT-0.9(FREE HEIGHT-THICKNESS)]; 300 LBS MIN TO 400 LBS MAX.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING No AND REVISION LETTER PER MIL-STD-130.



1899950-011	1899950-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL 1▷
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Frieder DATE 27 APR 63
CHECKED 27 APR 63
APPROVAL 27 APR 63
APPROVAL 27 APR 63
NASA APPROVAL 5-1-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

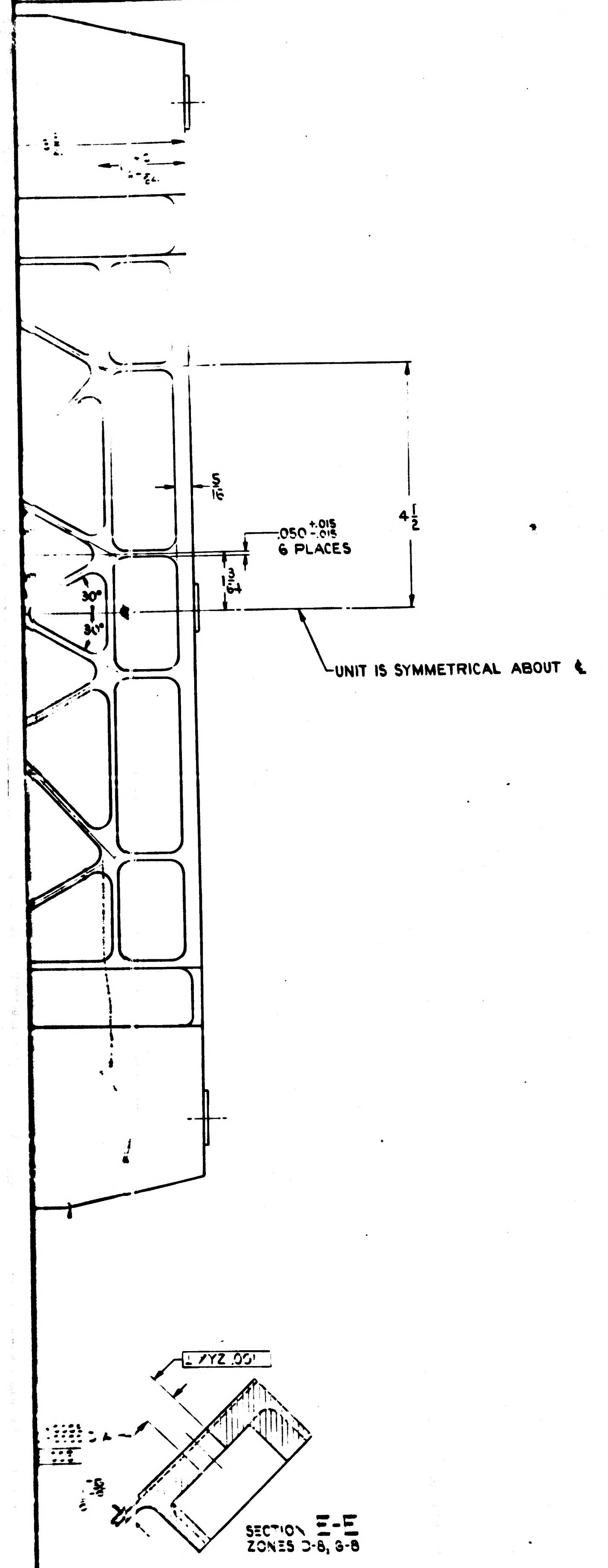
WASHER-SPRING
BELLEVILLE TYPE

CODE IDENT NO.
SIZE C
1899979
SCALE 1:1
SHEET 1 OF 1

MIL 1077C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS TDRR 01593					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		UPGRADED FOR CLASS A RELEASE TDRR 01593		6-14 63	G.L. / GK


5/16
.050 +.015 -.015
6 PLACES
4 1/2
1 3/64
30°
30°
UNIT IS SYMMETRICAL ABOUT ℄
⊥ XYZ .001
SECTION E-E
ZONES D-8, G-8

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	3	1899981-2	PAD REFERENCE
1	1	1899981-1	BASE

LIST OF PARTS AND MATERIALS

A

1899981

(34)

NEXT ASSY	USED ON
2777SZ	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+1°
− 1/64	−.005	−1°

DO NOT SCALE THIS DRAWING

MATERIAL ▷1

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 7 JUN 63
CHECKED 11 JUN 63
APPROVAL HANN 11 JUN 63
APPROVAL JUN 63
NASA APPROVAL 6-19-63
KW June 21 '63
MIT APPROVAL 19 Jun 63

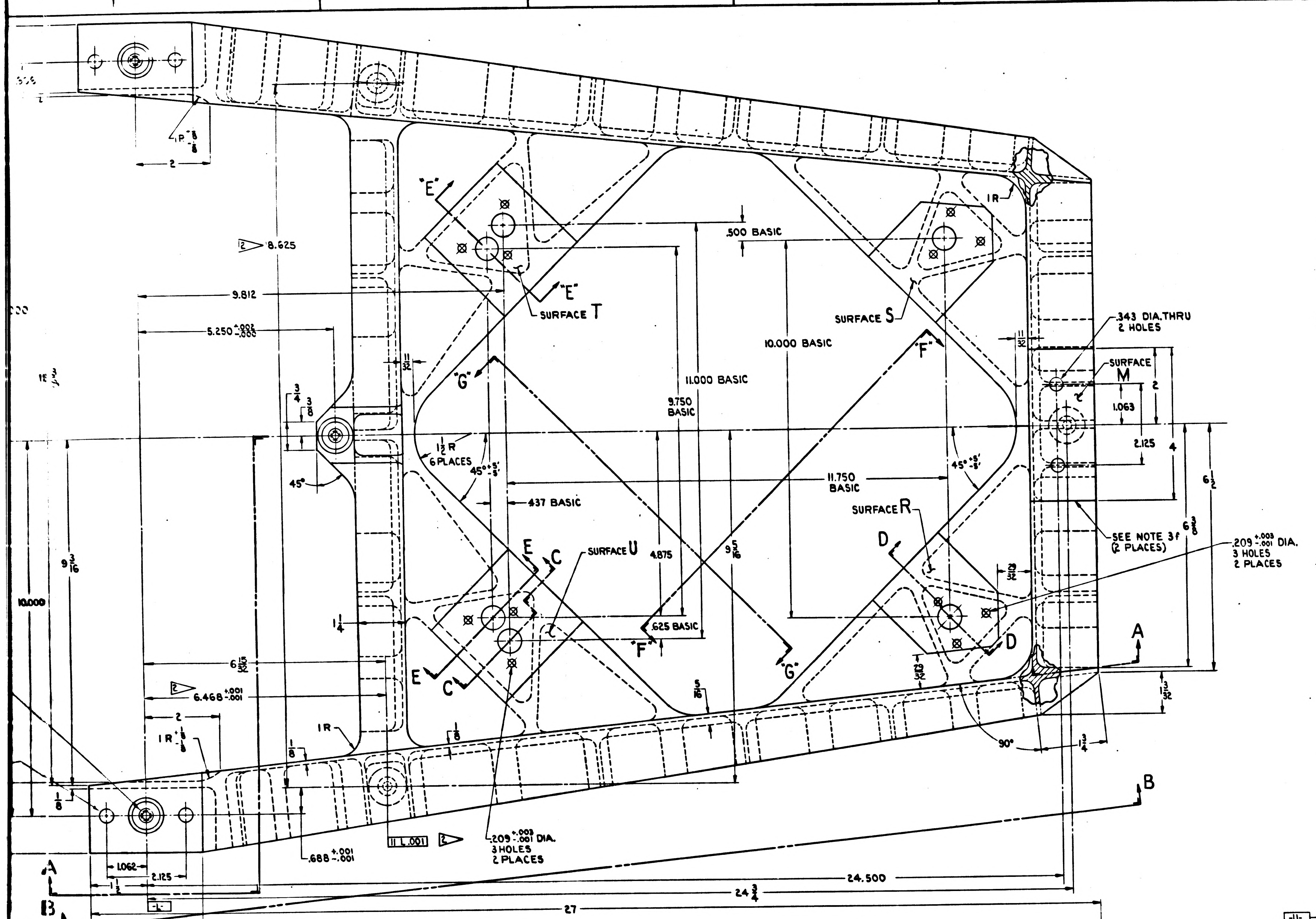
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY,
NAVIGATION BASE

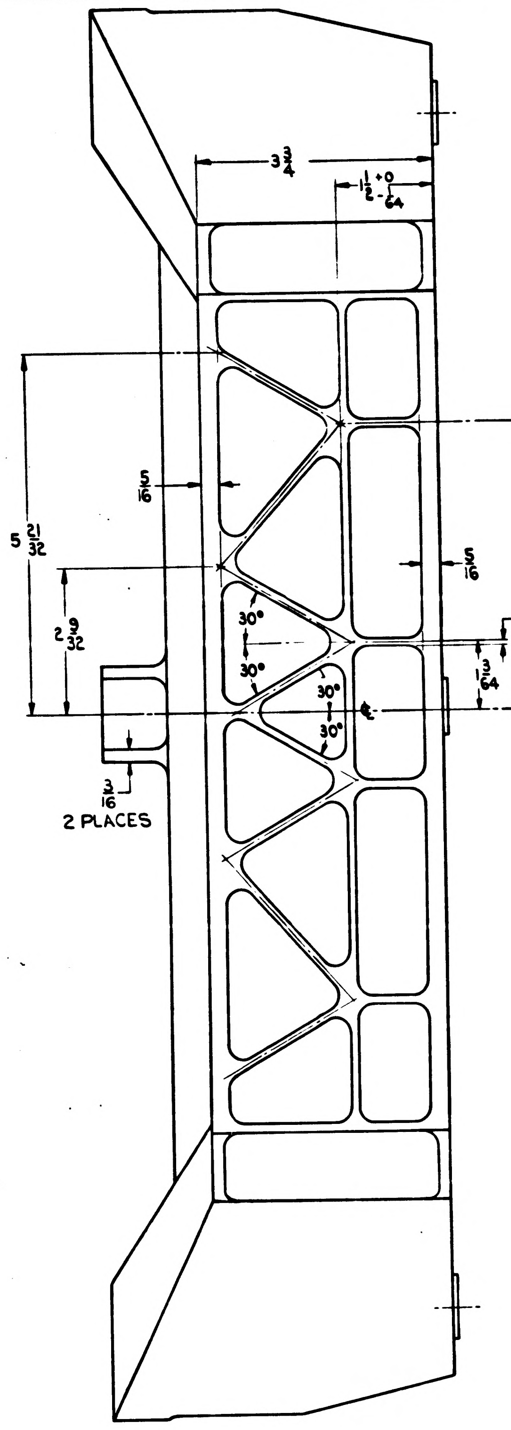
CODE IDENT NO.
SIZE J3
1899981
SCALE 1:1
SHEET

INCHES
PHOTOGRAPHIC SCALE ONLY

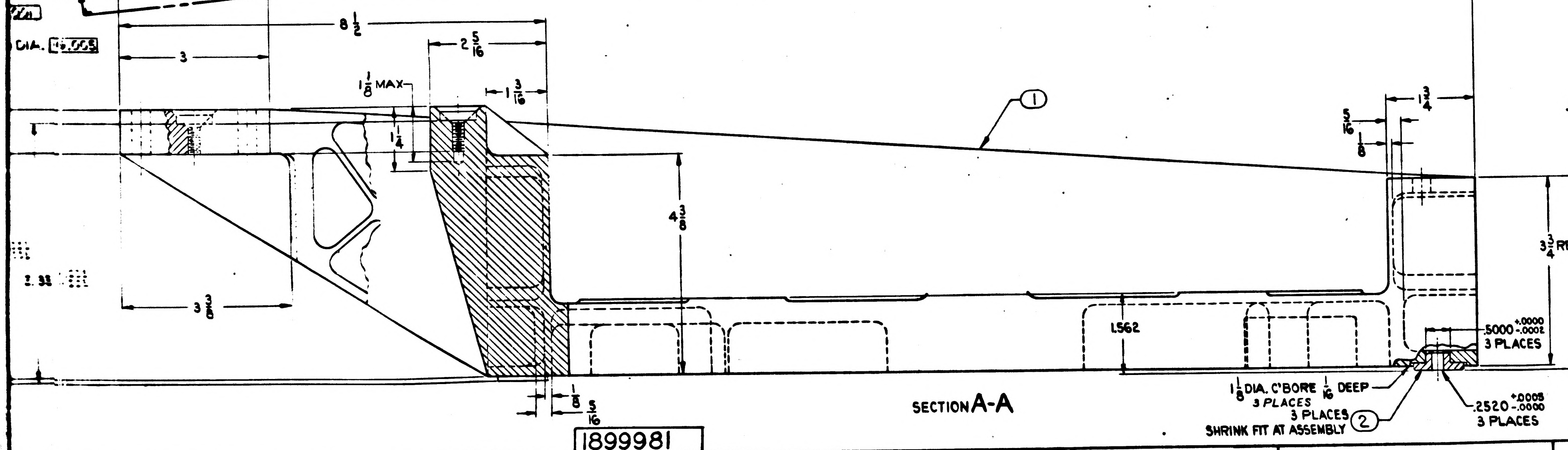
E-4



"E"
"E"
SURFACE T
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
SURFACE S
"F"
"G"
1R
.343 DIA. THRU 2 HOLES
SURFACE M
11/32
2
1.063
2.125
4
6 1/2
6 3/8
1 1/2 R 6 PLACES
45° ± 5'
11.750 BASIC
45° +8' -8'
.437 BASIC
SURFACE R
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
SURFACE U
4.875
9 5/16
.625 BASIC
29/32
D
D
E
C
E
C
"F"
"G"
23/32
5/16
1 3/32
A
90°
1 3/4
B
9.812
8.625
5.250 +.002 -.000
3/4
3/8
45°
11/32
10.000
9 3/16
1 1/4
6 15/32
6.468 +.001 -.001
1R +1/8
1R
1/8
2
1/8
.688 +.001 -.001
11 ⊥ .001
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
1.062
2.125
1 1/2
24.500
24 3/4
27
A
B
-L-
1P +1/8 -1/8
2

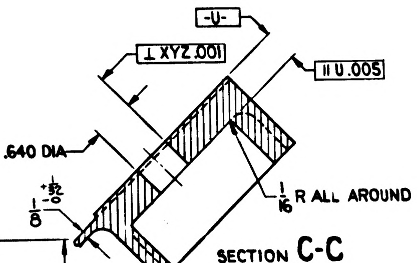


3 3/4
1 1/8 +0 -1/64
5/16
5 21/32
2 9/32
30°
30°
30°
30°
5/16
.050 +.015 -.015 6 PLACES
1 3/64
4 1/2
3/16 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄



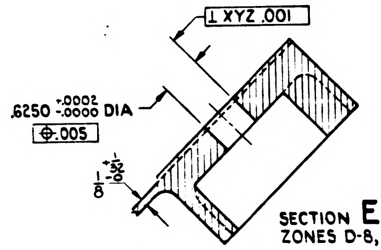
DIA. ⊕.005
8 1/2
3
2 5/16
1 1/8 MAX
1 3/16
①
1 1/4
5/16
1/8
1 3/4
4 3/8
3 3/4 REF
3.812 +.002 -.002 (SURFACE "M")
3 3/8
1.562
.5000 +.0000 -.0002 3 PLACES
1/8
5/16
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
3 PLACES ②
SHRINK FIT AT ASSEMBLY
.2520 +.0005 -.0000 3 PLACES

SECTION A-A



-U-
⊥ XYZ .001
11 U .005
.640 DIA
+.02 -0
1/8
1/16 R ALL AROUND

SECTION C-C
2 PLACES



⊥ XYZ .001
.6250 +.0002 -.0000 DIA
⊕ .005
1/8 +1/32 -0

SECTION E-E
ZONES D-8, G-8

1899981

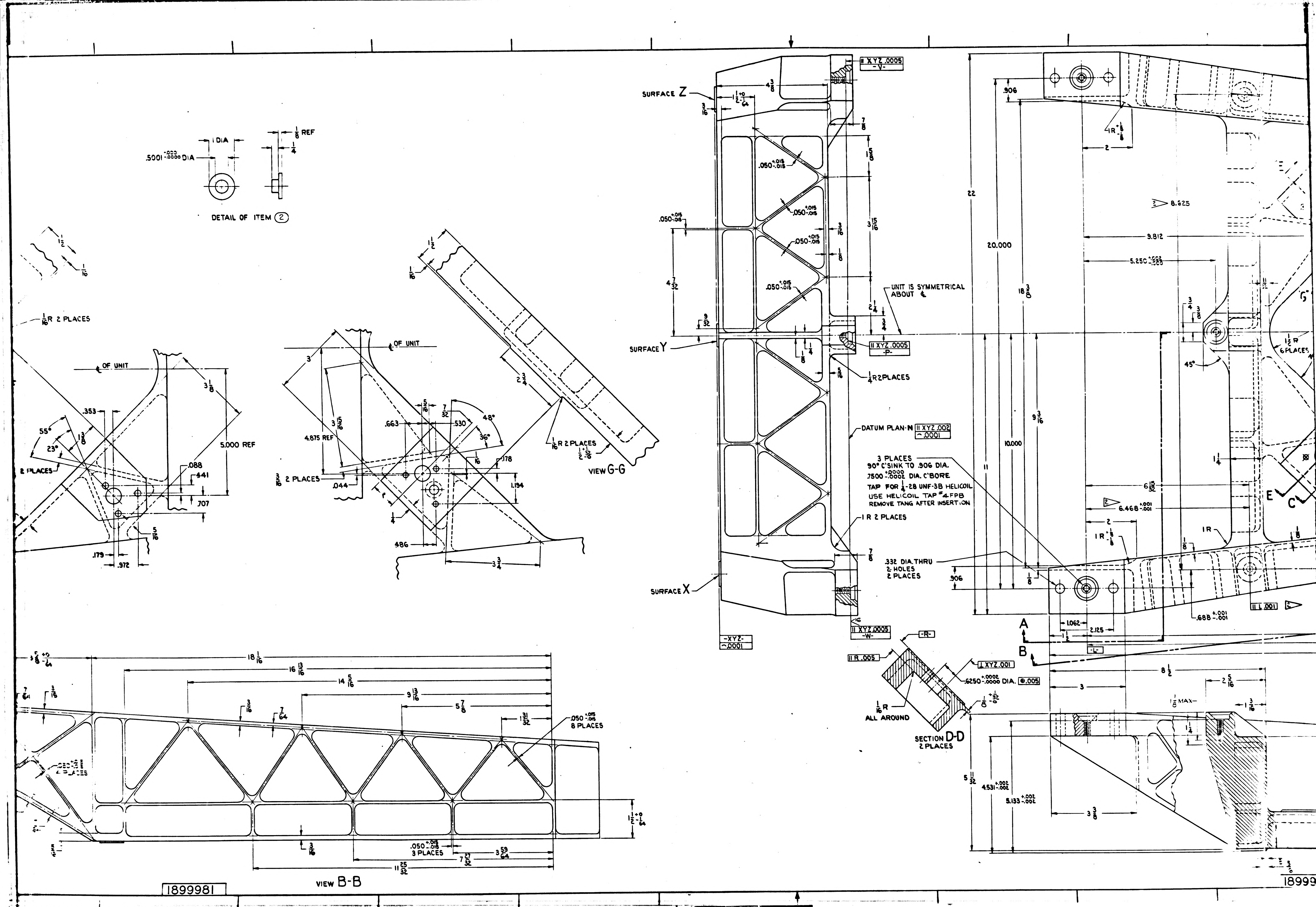
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLE
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

1899982	18999
NEXT ASSY	USED ON
APPLICATION	

AC SP
ACSP
DRAWN
CHECK
APPRO
APPRO
NASA
MIT A

INCHES
PHOTOGRAPHIC SCALE ONLY

F-3


DETAIL OF ITEM (2)
1 DIA
.5001 DIA
1/8 REF
1/4
1/16 R 2 PLACES
℄ OF UNIT
55°
23°
2 PLACES
.353
1 3/8
3 1/8
5.000 REF
.088
.441
.707
5/16
.179
.972
3
3 15/16
4.875 REF
3/16 2 PLACES
.044
.663
5/16
7/32
.530
48°
36°
1/16
.178
1.194
1/4
.486
3 3/4
1 1/2
1/16
2 3/4
1/16 R 2 PLACES
VIEW G-G
SURFACE Z
SURFACE Y
SURFACE X
4 3/8
3/16
.050 +.015 -.015
4 7/32
9/32
1 5/8
3 15/16
2 1/4
3/4
1/8
7/8
5/16
1/4 R 2 PLACES
1 R 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
DATUM PLAN-N
II XYZ .0005 -V-
II XYZ .0005 -P-
II XYZ .0005 -W-
II XYZ .002 ⌒.0001
-XYZ- ⌒.0001
3 PLACES
90° C'SINK TO .906 DIA.
.7500 +.0000 -.0002 DIA. C'BORE
TAP FOR 1/4-28 UNF-3B HELICOIL
USE HELICOIL TAP #4 FPB
REMOVE TANG AFTER INSERTION
.332 DIA. THRU
2-HOLES
2 PLACES
.906
22
20.000
18 3/8
11
10.000
9 3/16
1 R +1/8
2
8.625
9.812
5.250
6 15/32
6.468 +.001 -.001
45°
1/2 R 6 PLACES
1 1/4
E
C
1 R
1/8
.688 +.001 -.001
II L .001
1.062
2.125
1/2
A
B
-R-
-L-
II R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA. ⊕ .005
1/16 R ALL AROUND
1/8 +1/32 -0
SECTION D-D 2 PLACES
8 1/2
3
2 5/16
1 3/16
1/8 MAX
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 3/8
18 1/16
16 13/16
14 5/16
9 13/16
5 7/8
1 31/32
.050 +.015 -.015 8 PLACES
7/64
3/16
1 1/2
.050 +.015 -.015 3 PLACES
7 27/32
3 59/64
11 25/32
SECTION 4 PLACES
VIEW B-B
1899981
INCHES
PHOTOGRAPHIC SCALE ONLY

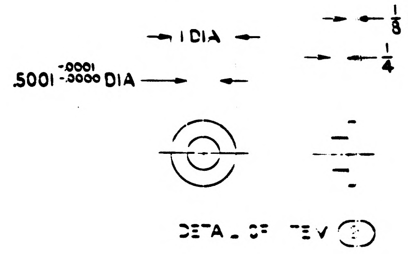
F-2

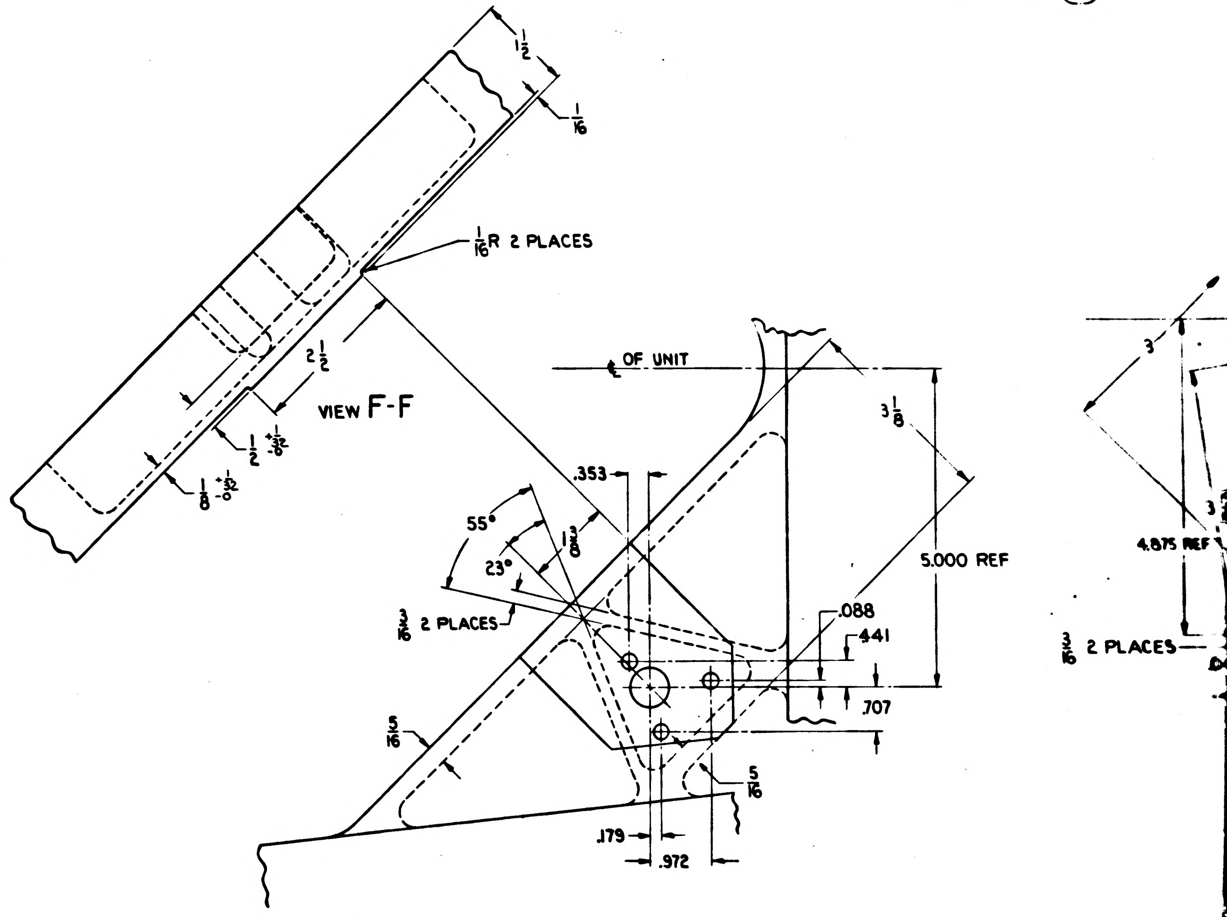
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

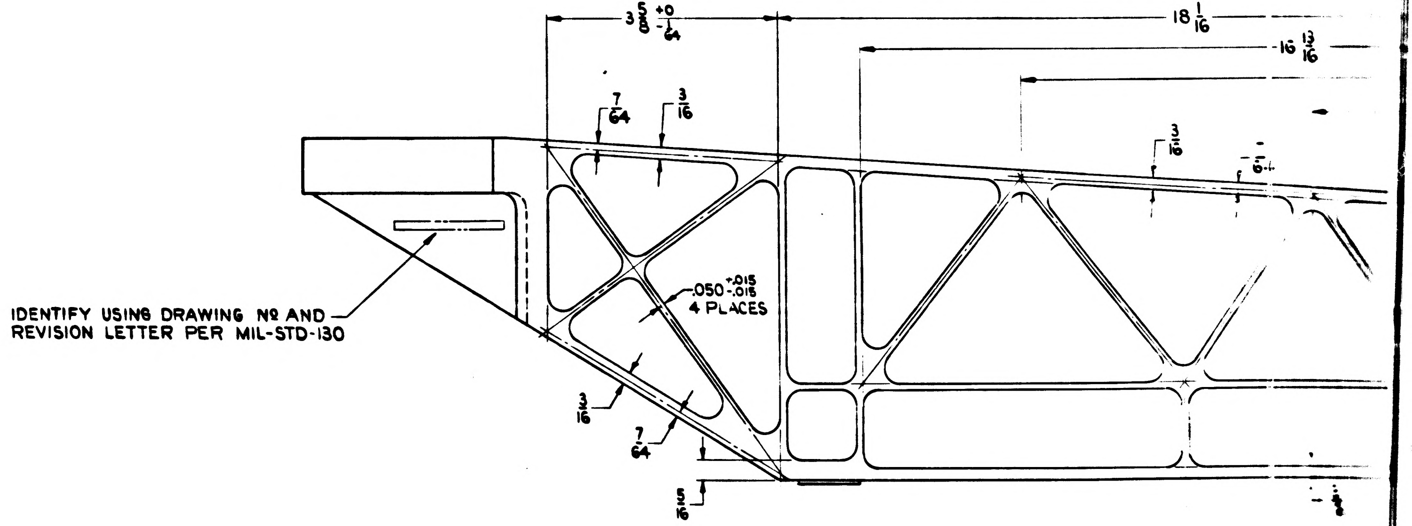
1 2. MATERIAL:
   a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
   b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED 63√.
      3. ALL FILLETS 1/4 R.
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
   b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   c. SURFACES RST & U TO BE 32√.
   d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
   e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
   f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 3/4 REF DIMENSION

2 h. APPLIES ONLY TO .2520 DIA. HOLES.

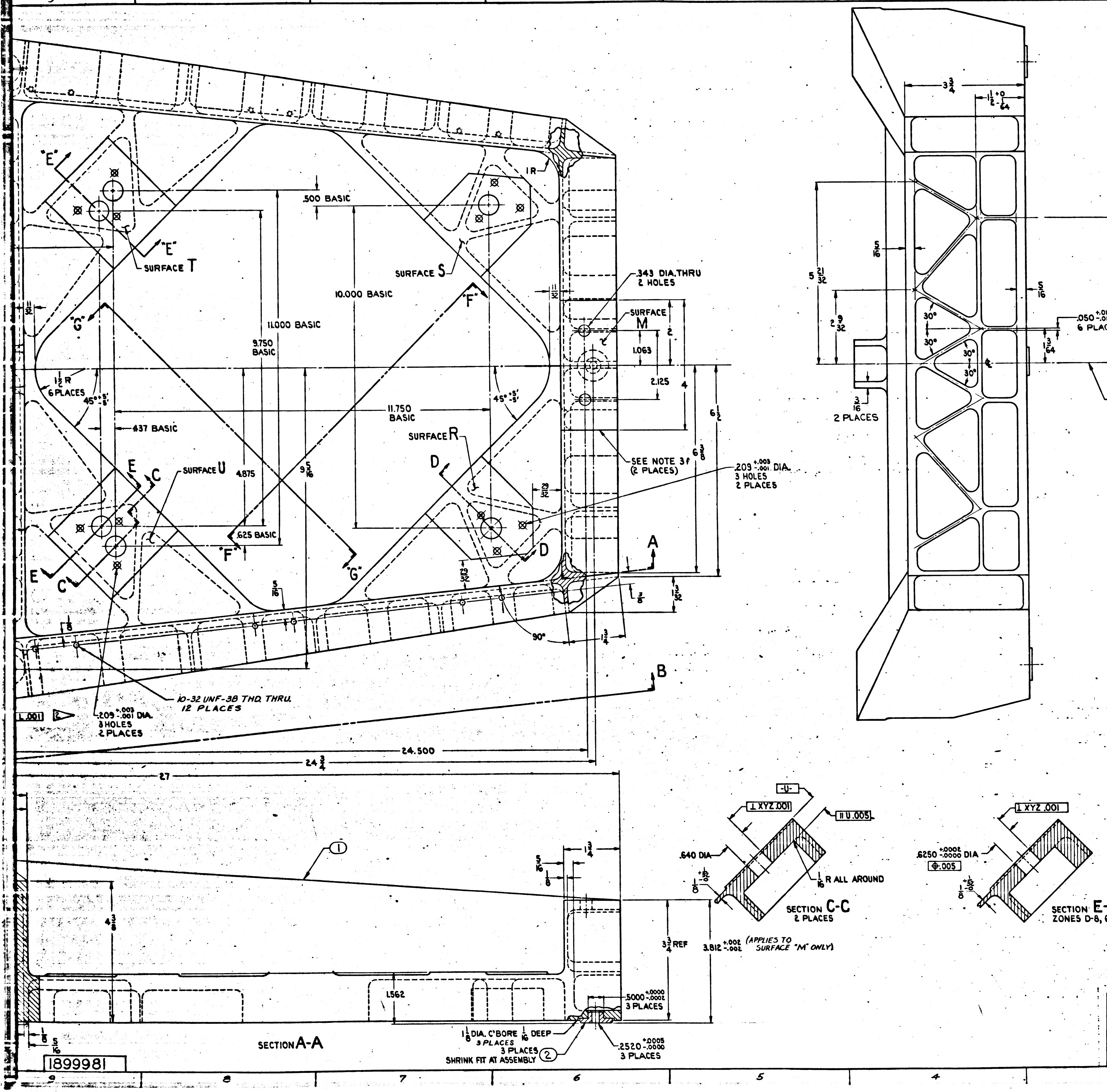

1 DIA
.5001 +.0001 -.0000 DIA
1/8 REF
1/4
DETAIL OF ITEM


1/2
1/16
1/16 R 2 PLACES
2 1/2
VIEW F-F
1/2 +1/32 -0
1/8 +1/32 -0
℄ OF UNIT
3 1/8
.353
55°
23°
1 3/8
3/16 2 PLACES
5.000 REF
.088
.441
.707
5/16
5/16
.179
.972
3
4.875 REF
3/16 2 PLACES


3 5/8 +0 -1/64
18 1/16
16 13/16
7/64
3/16
3/16
.050 +.015 -.015 4 PLACES
IDENTIFY USING DRAWING NO AND REVISION LETTER PER MIL-STD-130
3/16
7/64
5/16

1899981

REVISIONS TDRR 01593					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		UPGRADED FOR CLASS A RELEASE TDRR 01593		6-14 63	E.L. WK
B		REVISED IN ACCORDANCE WITH TDRR 02266		31 July 63	R.W.



9
8
7
6
5
4
3
2
1
"E"
IR
.500 BASIC
"E"
SURFACE T
SURFACE S
10.000 BASIC
.343 DIA.THRU
2 HOLES
11/32
"G"
"F"
SURFACE M
11.000 BASIC
9.750 BASIC
1.063
2
1 1/2 R
6 PLACES
45° +5' -5'
45° +5' -5'
2.125
4
11.750 BASIC
6 1/2
.437 BASIC
SURFACE R
SEE NOTE 3f (2 PLACES)
6 3/8
.209 +.003 -.001 DIA.
3 HOLES
2 PLACES
E
C
SURFACE U
4.875
9 5/16
D
29/32
"F"
.625 BASIC
"G"
D
29/32
A
E
C
5/16
1 3/32
1/8
90°
1 3/4
B
10-32 UNF-3B THD. THRU.
12 PLACES
.001
2
.209 +.003 -.001 DIA.
3 HOLES
2 PLACES
24.500
24 3/4
27
①
1 3/4
5/16
1/8
4 3/8
3 3/4 REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
1.562
.5000 +.0000 -.0002
3 PLACES
1/8
5/16
SECTION A-A
1 1/8 DIA. C'BORE 1/16 DEEP
3 PLACES
3 PLACES
SHRINK FIT AT ASSEMBLY ②
.2520 +.0005 -.0000
3 PLACES
1899981
3 3/4
1 1/2 +0 -1/64
5 21/32
5/16
5/16
2 9/32
30°
30°
30°
30°
.050 +.015 -.015
6 PLACES
4 1/2
1 3/64
3/16
2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA.
+1/32 -0
1/8
1/16 R ALL AROUND
SECTION C-C
2 PLACES
⊥ XYZ .001
.6250 +.0002 -.0000 DIA.
⊕ .005
+1/32 -0
1/8
SECTION E-E
ZONES D-8, G-8

2	3	1899981-2	PAD REFERENCE	
1	1	1899981-1	BASE	
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	

LIST OF PARTS AND MATERIALS

JUL 31 1963 JUL 31 1963

1899982	1899950-021
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL 1

CONTRACT NAS9-497

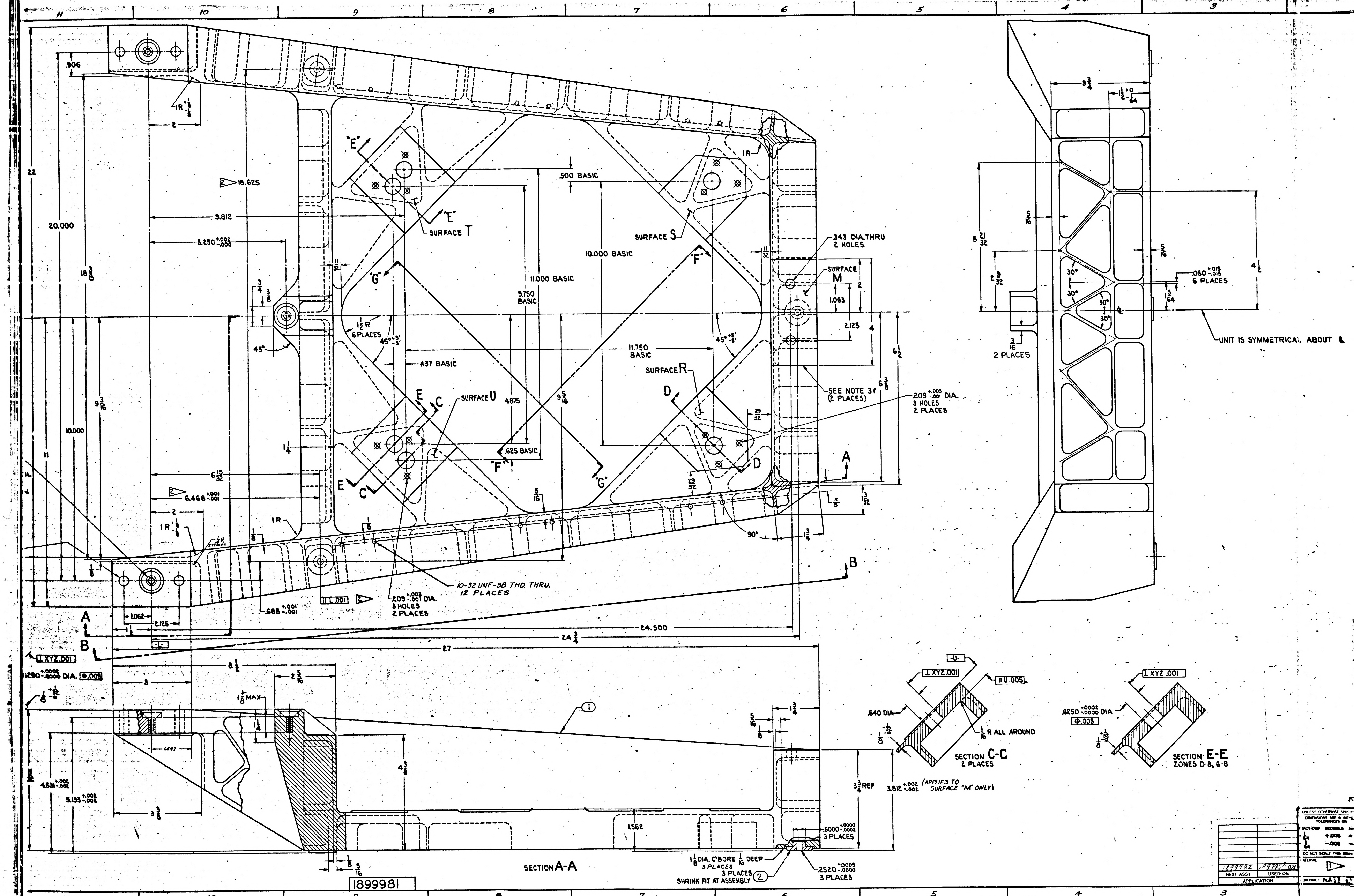
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 7 JUN 63
CHECKED 11 JUN 63
APPROVAL J. H. HANN 11 JUN 63
APPROVAL 11 JUN 63
NASA APPROVAL 6-19-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

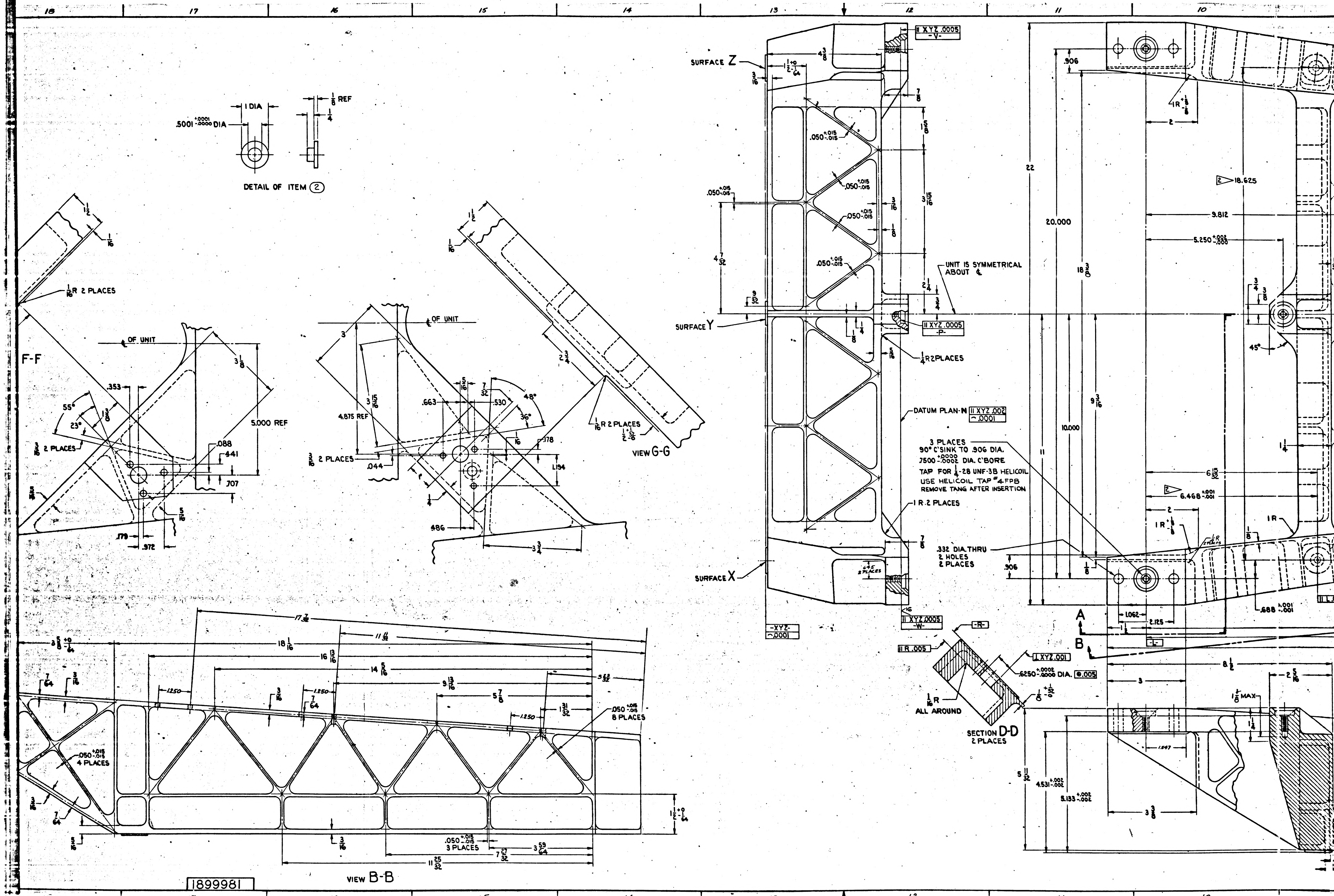
STRUCTURAL ASSY,
NAVIGATION BASE

CODE IDENT NO. SIZE J3 1899981
SCALE 1:1 SHEET

E-4



11
10
9
8
7
6
5
4
3
.906
1R +1/8
2
22
20.000
18 3/8
18.625
9.812
5.250 +.002 -.000
11.000 BASIC
9.750 BASIC
10.000 BASIC
.500 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
9 5/16
9 3/16
10.000
11
6 15/32
6.468 +.001 -.001
"E"
SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
"F"
"G"
1 1/2 R 6 PLACES
45°
45° +5' -5'
.343 DIA. THRU 2 HOLES
1.063
2.125
4
6 1/2
6 3/8
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
29/32
11/32
5/16
1 3/32
3/8
90°
1 3/4
10-32 UNF-3B THD. THRU. 12 PLACES
11 L .001
.688 +.001 -.001
1.062
2.125
24.500
24 3/4
27
A
B
C
D
E
1 XYZ .001
.6250 +.0002 -.0000 DIA. ⊕ .005
3
8 1/2
2 5/16
1 1/8 MAX
1 1/4
①
4.531 +.002 -.002
5.133 +.002 -.002
3 3/8
4 3/8
1.562
3 3/4 REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
.5000 +.0000 -.0002 3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
.2520 +.0005 -.0000 3 PLACES
3 PLACES ② SHRINK FIT AT ASSEMBLY
SECTION A-A
1899981
3 3/4
1 1/2 +0 -1/64
5 21/32
2 9/32
30°
.050 +.015 -.015 6 PLACES
1 3/64
3/16 2 PLACES
4 1/2
UNIT IS SYMMETRICAL ABOUT ℄
.640 DIA.
-U-
1 XYZ .001
11 U .005
1/16 R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION E-E ZONES D-8, G-8
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS
± 1/64 +.005 -.005
DO NOT SCALE THIS DRAWING
MATERIAL
1899982
1899950-011
NEXT ASSY
USED ON
APPLICATION
CONTRACT NAS8
F-3


DETAIL OF ITEM ②
1 DIA
.5001 +.0001 -.0000 DIA
1/8 REF
1/4
F-F
1/16 R 2 PLACES
℄ OF UNIT
55°
23°
3/16 2 PLACES
.353
3 1/8
5.000 REF
.088
.441
.707
.179
.972
5/16
℄ OF UNIT
3
3 15/16
4.875 REF
.663
.530
48°
36°
7/32
5/16
.178
1.194
3/16 2 PLACES
.044
.486
3 3/4
1 1/2
1/16
2 3/4
1/16 R 2 PLACES
1/2 +1/32 -0
VIEW G-G
SURFACE Z
SURFACE Y
SURFACE X
4 3/8
1/2 +0 -1/64
3/16
7/8
1 5/8
3 15/16
.050 +.015 -.015
4 7/32
9/32
2 1/4
3/4
1/4
1/8
5/16
1/4 R 2 PLACES
11 XYZ .0005 -V-
11 XYZ .0005 -P-
11 XYZ .0005 -W-
-XYZ- ⌒.0001
UNIT IS SYMMETRICAL ABOUT ℄
DATUM PLAN-N 11 XYZ .002 ⌒.0001
3 PLACES
90° C'SINK TO .906 DIA.
.7500 +.0000 -.0002 DIA. C'BORE
TAP FOR 1/4-28 UNF-3B HELICOIL
USE HELICOIL TAP #4-FPB
REMOVE TANG AFTER INSERTION
1 R 2 PLACES
.332 DIA. THRU
2 HOLES
2 PLACES
.906
22
20.000
18 3/8
10.000
9 3/16
11
9.812
5.250 +.002 -.000
18.625
6.468 +.001 -.001
6 15/32
.688 +.001 -.001
1 R +1/8 -1/8
45°
1 1/4
1.062
2.125
A
B
-R-
11 R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA. ⊚.005
1/16 R ALL AROUND
SECTION D-D
2 PLACES
8 1/2
3
2 5/8
1 1/8 MAX
1.547
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 3/8
17 7/32
18 1/16
16 13/16
14 5/16
11 11/32
9 13/16
5 7/8
1 31/32
3 5/8 +0 -1/64
7/64
1.250
.050 +.015 -.015 8 PLACES
.050 +.015 -.015 4 PLACES
.050 +.015 -.015 3 PLACES
7 27/32
3 59/64
11 25/32
1 1/2 +0 -1/64
VIEW B-B

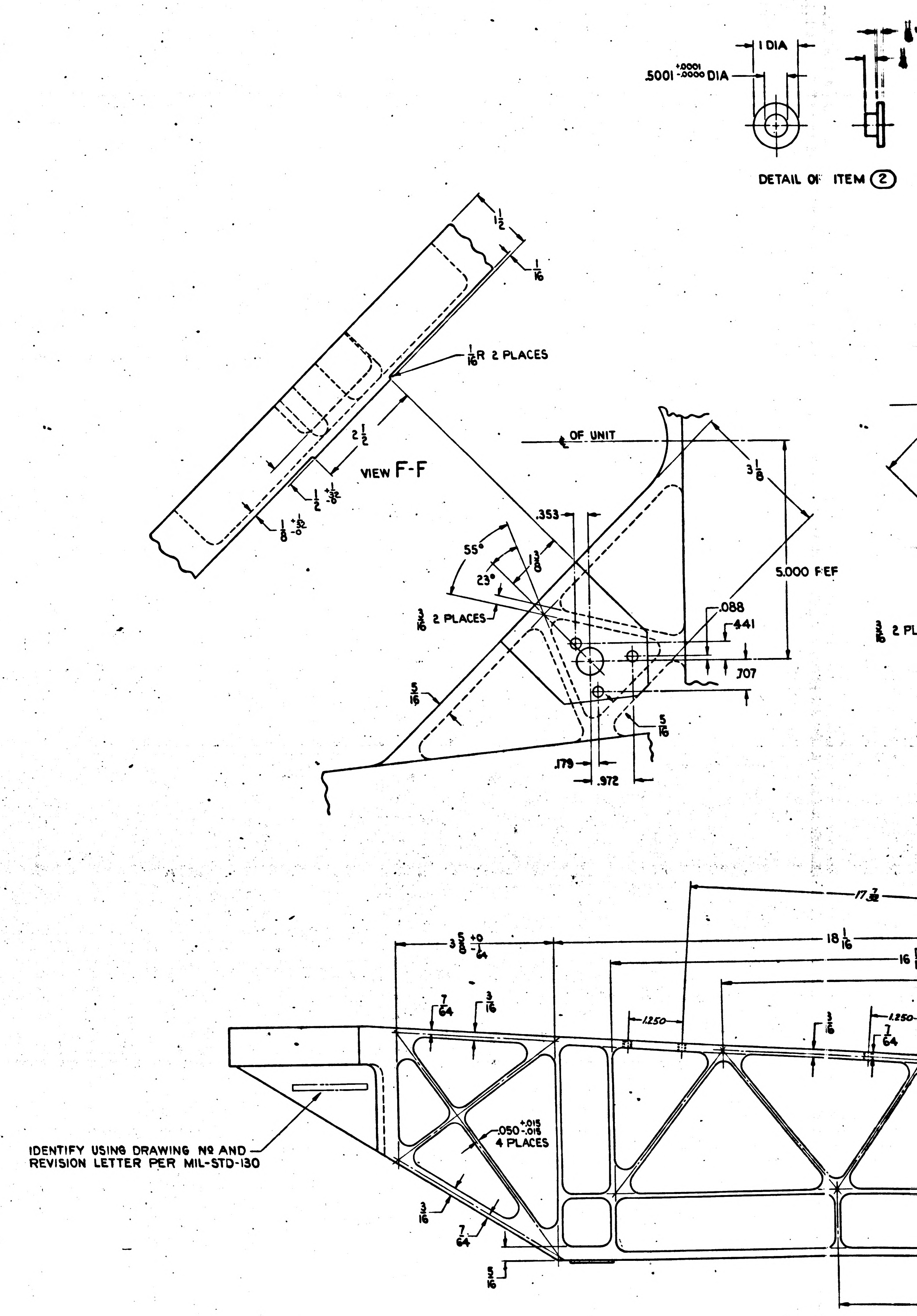
1899981

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

▷1 2. MATERIAL:
    a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
    b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

3. REQUIREMENTS:
    a. UNLESS OTHERWISE SPECIFIED:
        1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
        2. SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\surd}$.
        3. ALL FILLETS 1/4 R.
        4. ALL WEB THICKNESS TO BE .100
        5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
    b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
    c. SURFACES RST & U TO BE $\overset{32}{\surd}$.
    d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
    e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
    f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 3/4 REF DIMENSION

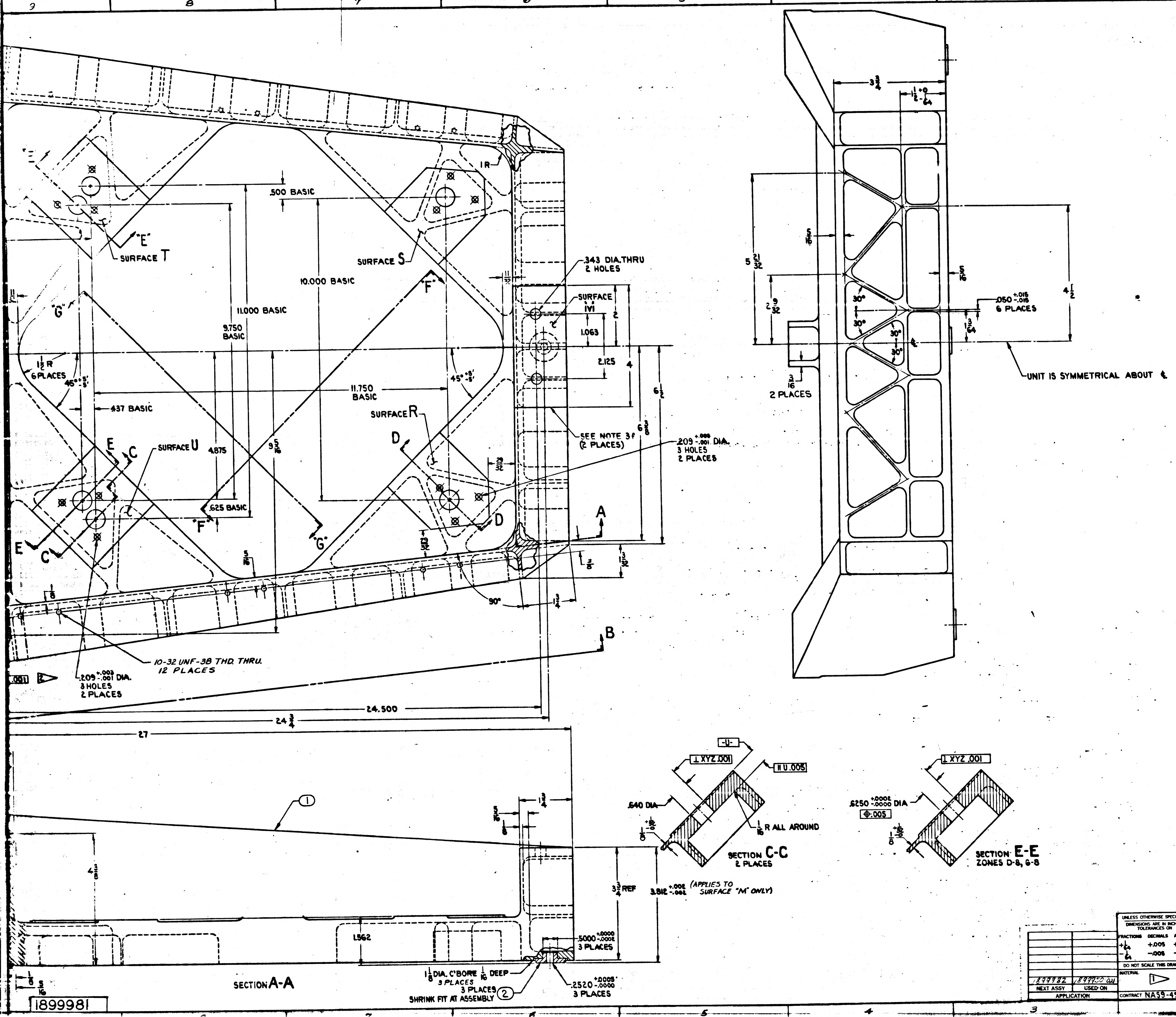
▷2 h. APPLIES ONLY TO .2520 DIA. HOLES.



1 DIA
.5001 +.0001 -.0000 DIA
DETAIL OF ITEM ②
1/2
1/16
1/16 R 2 PLACES
2 1/2
VIEW F-F
1/2 +1/32 -0
1/8 +1/32 -0
℄ OF UNIT
3 1/8
.353
55°
23°
1 3/8
3/16 2 PLACES
5.000 REF
.088
.441
.707
5/16
5/16
.179
.972
3/16 2 PL
17 7/32
18 1/16
16
3 5/8 +0 -1/64
7/64
3/16
1.250
3/16
1.250
7/64
.050 +.015 -.015 4 PLACES
IDENTIFY USING DRAWING NO AND REVISION LETTER PER MIL-STD-130
3/16
7/64
5/16

1899981

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		UPGRADED FOR CLASS A RELEASE TDRR 01593		6-14 63	E.L. WK
B		REVISED IN ACCORDANCE WITH TDRR 02266		31 July 63	R.W.
C		REVISED IN ACCORDANCE WITH TDRR 02311		31 July 63	RWG WK



SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
"E"
"F"
"G"
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
$9\frac{5}{16}$
1R
$1\frac{1}{2}$R 6 PLACES
45° +5' -5'
.343 DIA. THRU 2 HOLES
1.063
2.125
SEE NOTE 3f (2 PLACES)
.209 +.000 -.001 DIA. 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU. 12 PLACES
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
.001
24.500
$24\frac{3}{4}$
27
90°
$\frac{29}{32}$
$\frac{5}{16}$
$6\frac{1}{2}$
$6\frac{3}{8}$
$1\frac{3}{32}$
$1\frac{3}{4}$
A
B
C
D
E
$3\frac{3}{4}$
$5\frac{21}{32}$
$2\frac{9}{32}$
$4\frac{1}{2}$
30°
.050 +.015 -.015 6 PLACES
$1\frac{3}{64}$
$\frac{3}{16}$ 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
⊥ XYZ .001
-U-
∥ U .005
.640 DIA
$\frac{1}{16}$ R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION E-E ZONES D-8, G-8
①
$4\frac{3}{8}$
$3\frac{3}{4}$ REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
.5000 +.0000 -.0002 3 PLACES
1.562
$1\frac{1}{8}$ DIA. C'BORE $\frac{1}{16}$ DEEP 3 PLACES
3 PLACES ②
SHRINK FIT AT ASSEMBLY
.2520 +.0005 -.0000 3 PLACES
SECTION A-A
1899981

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	3	1899981-2	PAD REFERENCE
1	1	1899981-1	BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899982	1899950-021

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
−1/64	−.005	−1°

DO NOT SCALE THIS DRAWING

MATERIAL ▷1

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 7 JUN 63
CHECKED [illegible] 11 JUN 63
APPROVAL A HANN 11 JUN 63
APPROVAL [illegible] 11 JUN 63
NASA APPROVAL 6-16-63
MIT APPROVAL 14 Jun 63

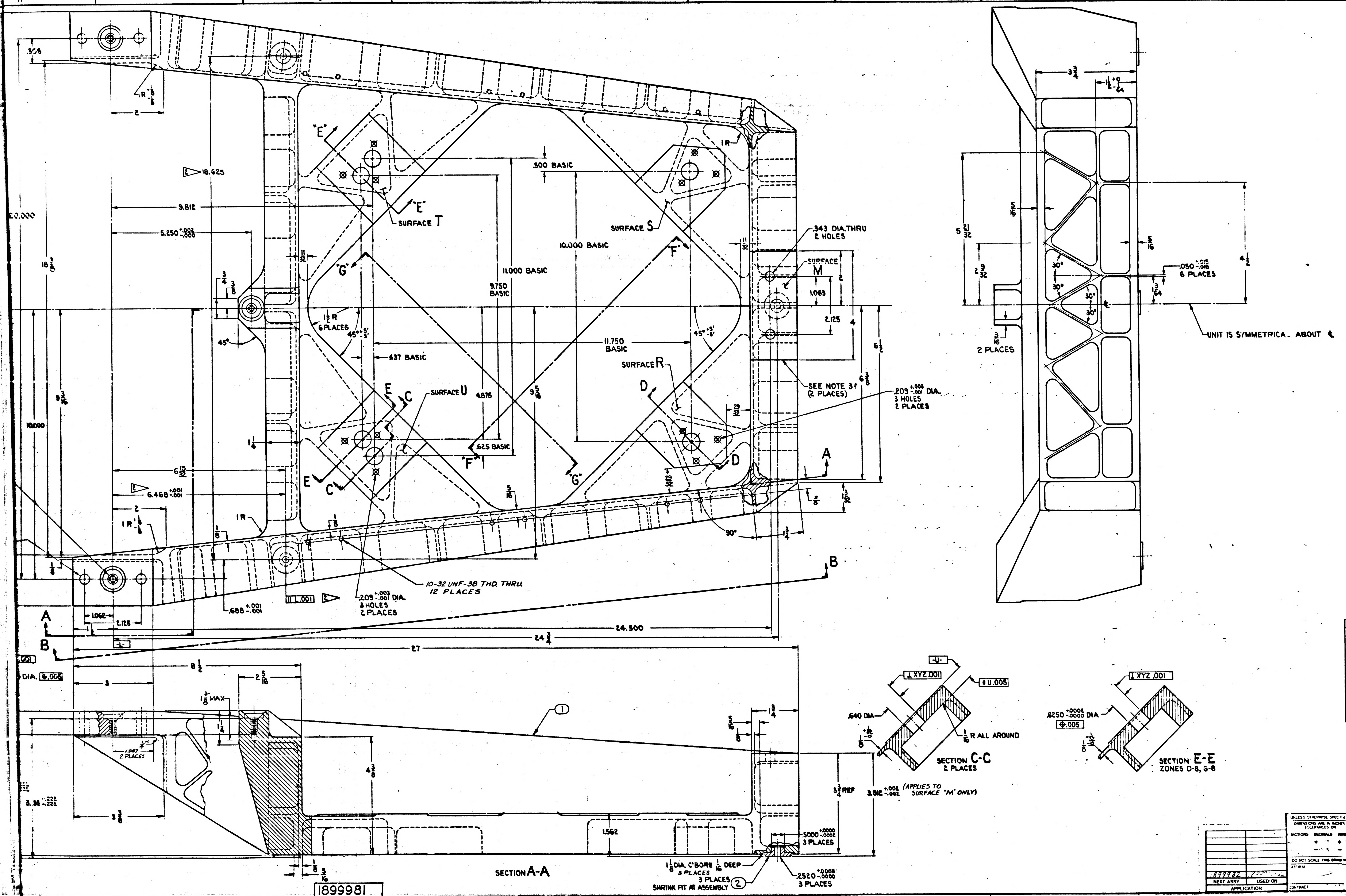
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY,
NAVIGATION BASE

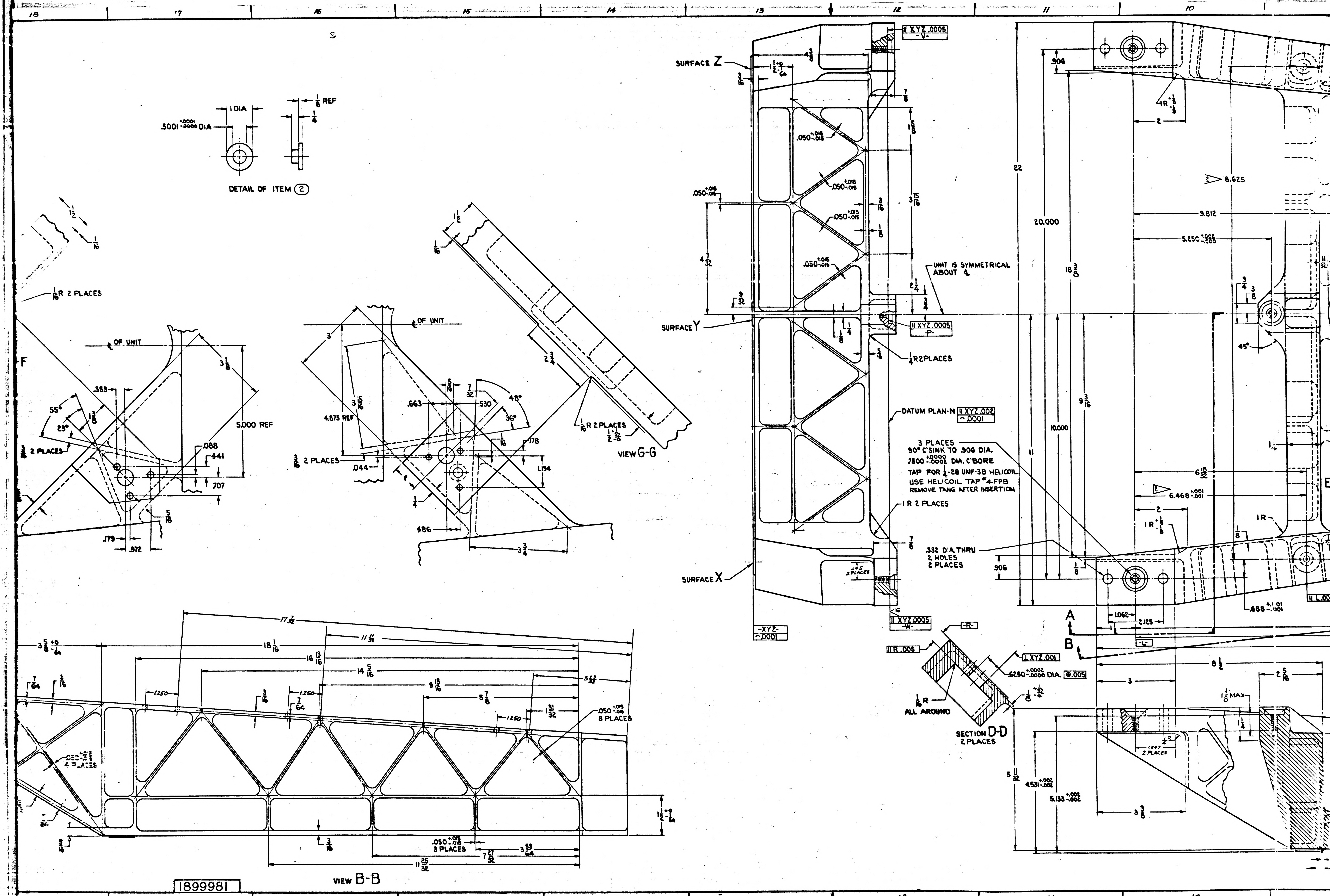
CODE IDENT NO.
SIZE J3
1899981
SCALE 1:1
SHEET

1899981

E-4



11
10
9
8
7
6
5
4
3
.306
R +1/8 -1/8
2
18.625
9.812
5.250 +.002 -.000
20.000
18 3/8
3/4
3/8
45°
9 3/16
10.000
1 1/4
6 15/32
6.468 +.001 -.001
2
1R +1/8 -1/8
1R
1/8
1/8
1.062
1 1/2
2.125
.688 +.001 -.001
11 L.001
"E"
"E"
SURFACE T
.500 BASIC
SURFACE S
10.000 BASIC
11.000 BASIC
9.750 BASIC
"G"
"F"
1 1/2 R
6 PLACES
45° +5' -5'
.437 BASIC
11.750 BASIC
45° +5' -5'
SURFACE R
SURFACE U
4.875
9 5/16
E
C
D
D
E
C
.625 BASIC
"F"
"G"
5/16
11/32
1R
.343 DIA. THRU
2 HOLES
SURFACE M
1.063
2
2.125
4
6 1/2
6 3/8
SEE NOTE 3f
(2 PLACES)
.209 +.003 -.001 DIA.
3 HOLES
2 PLACES
A
1/8
1 3/32
3/4
90°
29/32
B
10-32 UNF-3B THD. THRU
12 PLACES
.209 +.002 -.001 DIA.
3 HOLES
2 PLACES
A
B
24.500
24 3/4
27
.001
DIA. .005
8 1/2
3
2 5/16
1 1/8 MAX
1 1/4
1/4 R
.1997
2 PLACES
3 3/8
4 3/8
5/16
5/8
1 3/4
①
3 3/4 REF
3.812 +.002 -.002
1.562
.5000 +.0000 -.0002
3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP
3 PLACES
3 PLACES ②
SHRINK FIT AT ASSEMBLY
.2520 +.0005 -.0000
3 PLACES
5/16
SECTION A-A
1899981
3 3/4
1 1/2 +0 -1/64
5 21/32
5/16
2 9/32
5/16
30°
30°
30°
30°
.050 +.015 -.010
6 PLACES
1 3/64
4 1/2
3/16
2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA.
1/16 R ALL AROUND
SECTION C-C
2 PLACES
(APPLIES TO SURFACE "M" ONLY)
⊥ XYZ .001
.6250 +.0002 -.0000 DIA.
⊕ .005
SECTION E-E
ZONES D-8, G-8
1899982
NEXT ASSY
USED ON
APPLICATION
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT
INCHES
PHOTOGRAPHIC SCALE ONLY


DETAIL OF ITEM ②
.5001 +.0001 -.0000 DIA
1 DIA
1/8 REF
1/4
VIEW G-G
1/16 R 2 PLACES
1/2 +1/32 -1/8
C OF UNIT
3/16 2 PLACES
4.875 REF
5.000 REF
55°
23°
48°
36°
VIEW B-B
.050 +.015 -.015 8 PLACES
.050 +.015 -.015 3 PLACES
17 7/32
18 1/16
16 13/16
14 5/16
11 11/32
9 13/16
5 7/8
11 25/32
7 27/32
3 59/64
1.250
SURFACE Z
SURFACE Y
SURFACE X
UNIT IS SYMMETRICAL ABOUT C
DATUM PLAN-N
1/4 R 2 PLACES
1 R 2 PLACES
3 PLACES
90° C'SINK TO .906 DIA.
.7500 +.0000 -.0002 DIA. C'BORE
TAP FOR 1/4-28 UNF-3B HELICOIL
USE HELICOIL TAP #4 FPB
REMOVE TANG AFTER INSERTION
.332 DIA. THRU
2 HOLES
2 PLACES
-XYZ-
-V-
-P-
-W-
-R-
-L-
SECTION D-D
2 PLACES
1/16 R ALL AROUND
.6250 +.0002 -.0000 DIA.
22
20.000
18 3/8
10.000
9 3/16
11
8.625
9.812
5.250 +.002 -.000
6.468 +.001 -.001
.906
1.062
2.125
.688 +.001 -.001
8 1/2
4.531 +.002 -.002
5.133 +.002 -.002
5 11/32
45°
A
B
E
F
1899981
18
17
16
15
14
13
12
11
10

INCHES
PHOTOGRAPHIC SCALE ONLY

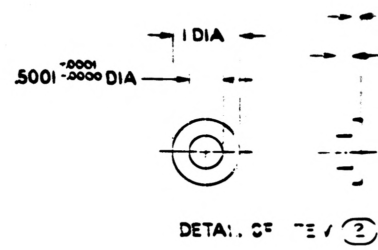
E-2

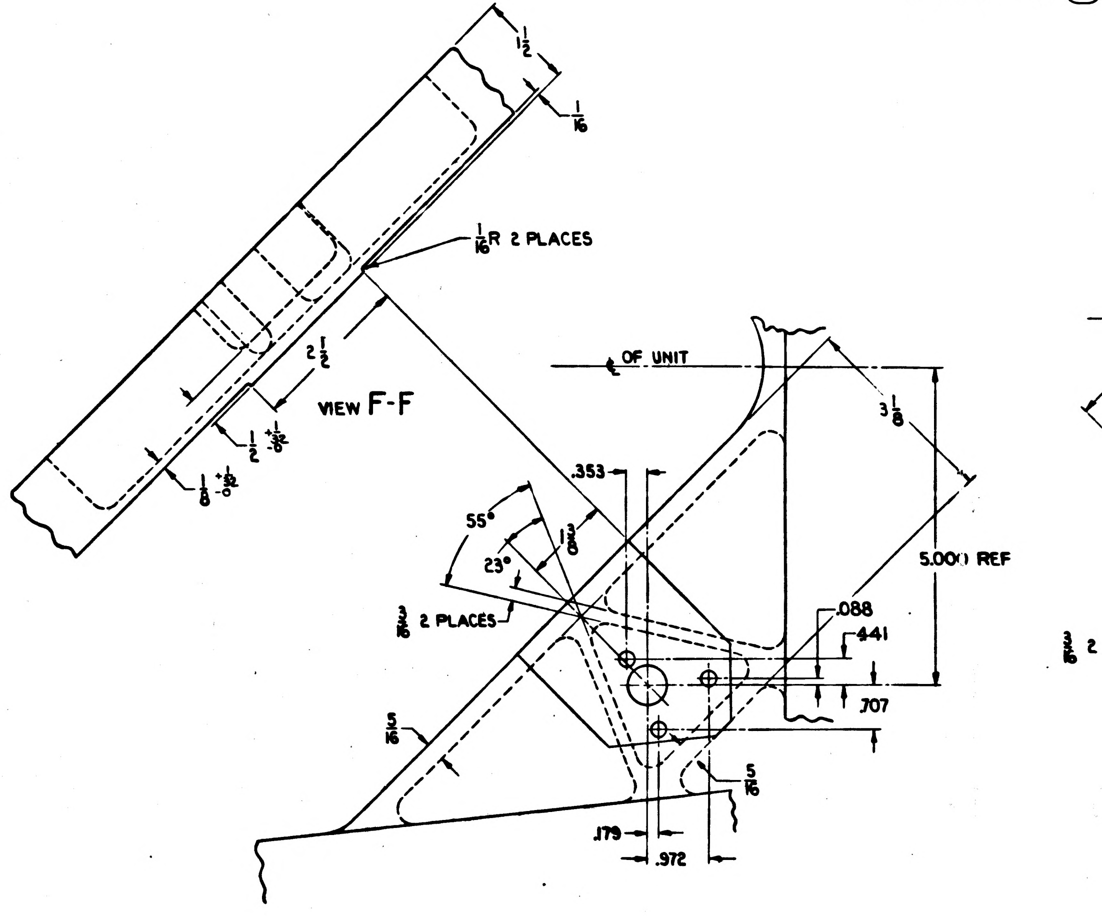
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

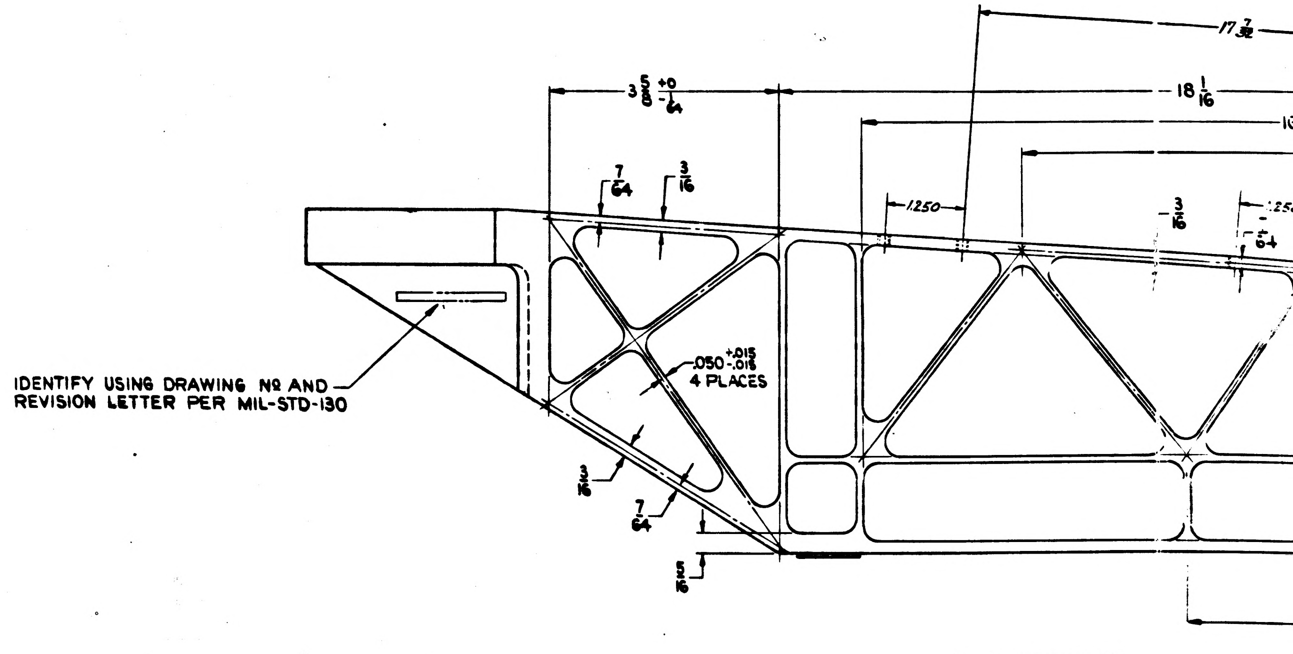
▷1 2. MATERIAL:
   a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
   b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\surd}$.
      3. ALL FILLETS ¼ R.
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
   b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   c. SURFACES RST & U TO BE $\overset{32}{\surd}$.
   d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
   e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
   f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW $3\frac{3}{4}$ REF DIMENSION

▷2 h. APPLIES ONLY TO .2520 DIA. HOLES.

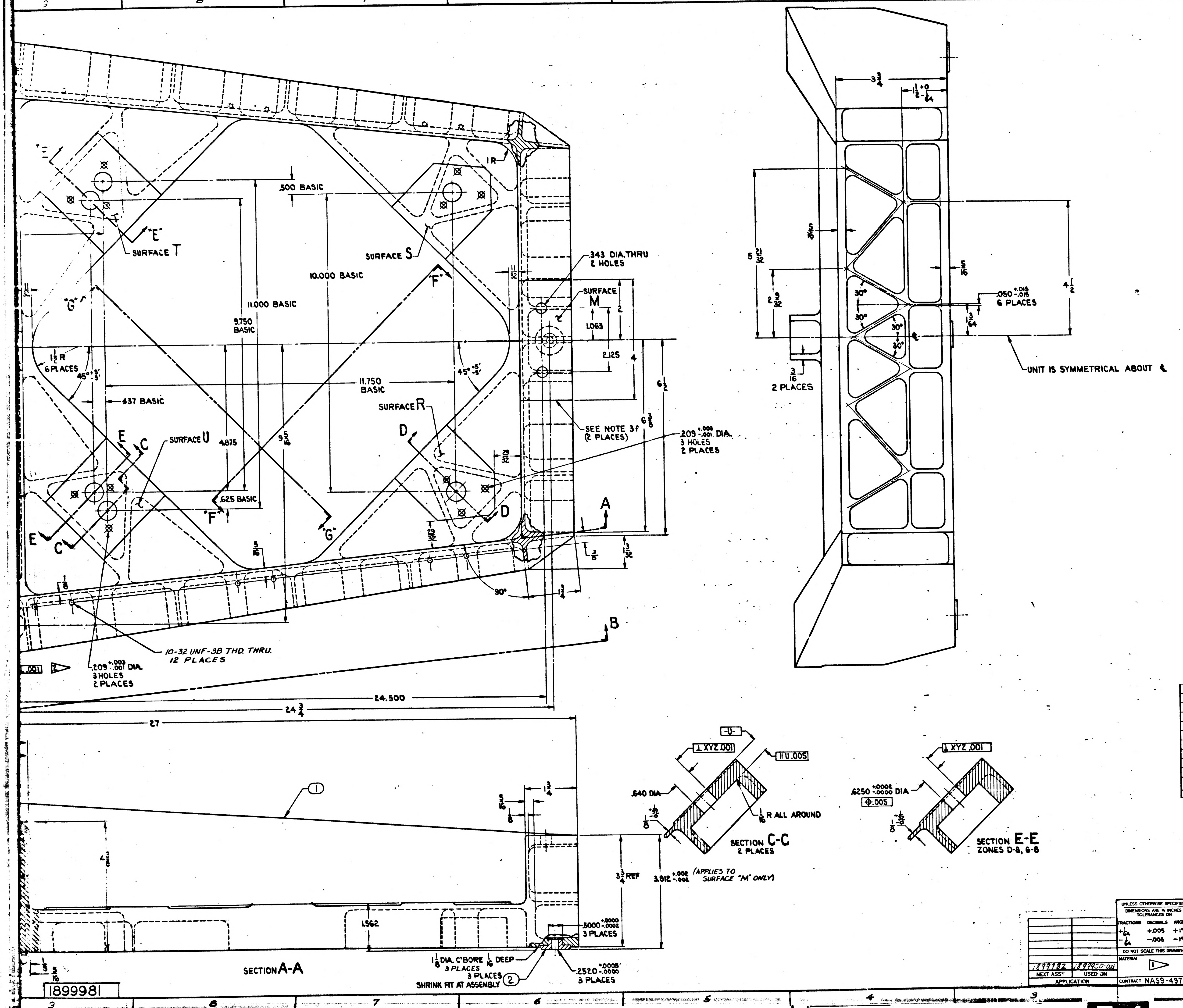

1 DIA
.5001 +.0001 -.0000 DIA
DETAIL


1½
1/16
1/16 R 2 PLACES
2½
VIEW F-F
½ +1/32 -1/8
1/8 +1/32 -0
℄ OF UNIT
3⅛
.353
55°
23°
1⅜
3/16 2 PLACES
5.000 REF
.088
.441
.707
5/16
5/16
.179
.972


3⅝ +0 -1/64
18 1/16
17 7/32
7/64
3/16
.1250
3/16
.050 +.015 -.015 4 PLACES
IDENTIFY USING DRAWING NO AND REVISION LETTER PER MIL-STD-130
3/16
7/64
5/16

1899981

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		UPGRADED FOR CLASS A RELEASE TDRR 01593		6-14 63	G.L. WK
B		REVISED IN ACCORDANCE WITH TDRR 02266		31 July 63	R.W.H.
C		REVISED IN ACCORDANCE WITH TDRR 02311		31 July 63	R.W.G. WK
D		REVISED IN ACCORDANCE WITH TDRR 02402		2 Aug 63	R.W.G. WK



.500 BASIC
SURFACE T
SURFACE S
"E"
"F"
"G"
10.000 BASIC
11.000 BASIC
9.750 BASIC
1R
.343 DIA. THRU 2 HOLES
SURFACE M
1.063
2.125
4
6 1/2
6 3/8
11/32
1 1/2 R 6 PLACES
45° +5' -5'
.437 BASIC
11.750 BASIC
SURFACE R
SURFACE U
4.875
9 5/16
.625 BASIC
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
29/32
A
B
C
D
E
5/16
1/8
3/32
90°
1 3/4
10-32 UNF-3B THD. THRU. 12 PLACES
24.500
24 3/4
27
3 3/4
1 1/2 +0 -1/64
5 21/32
2 9/32
3/16 2 PLACES
5/16
30°
.050 +.015 -.015 6 PLACES
1 3/64
4 1/2
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA
1/16 R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
1/8 +1/32 -0
SECTION E-E ZONES D-8, G-8
①
4 3/8
1.562
3 3/4 REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
.5000 +.0000 -.0002 3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
3 PLACES SHRINK FIT AT ASSEMBLY ②
.2520 +.0005 -.0000 3 PLACES
SECTION A-A
5/16
1899981

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	3	1899981-2	PAD REFERENCE
1	1	1899981-1	BASE

LIST OF PARTS AND MATERIALS

1899982	1899950-021
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL ①

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 7 JUN 63
CHECKED 11 JUN 63
APPROVAL HANN 11 JUN 63
APPROVAL 11 JUN 63
NASA APPROVAL 6-14-63
MIT APPROVAL 14 Jun 63

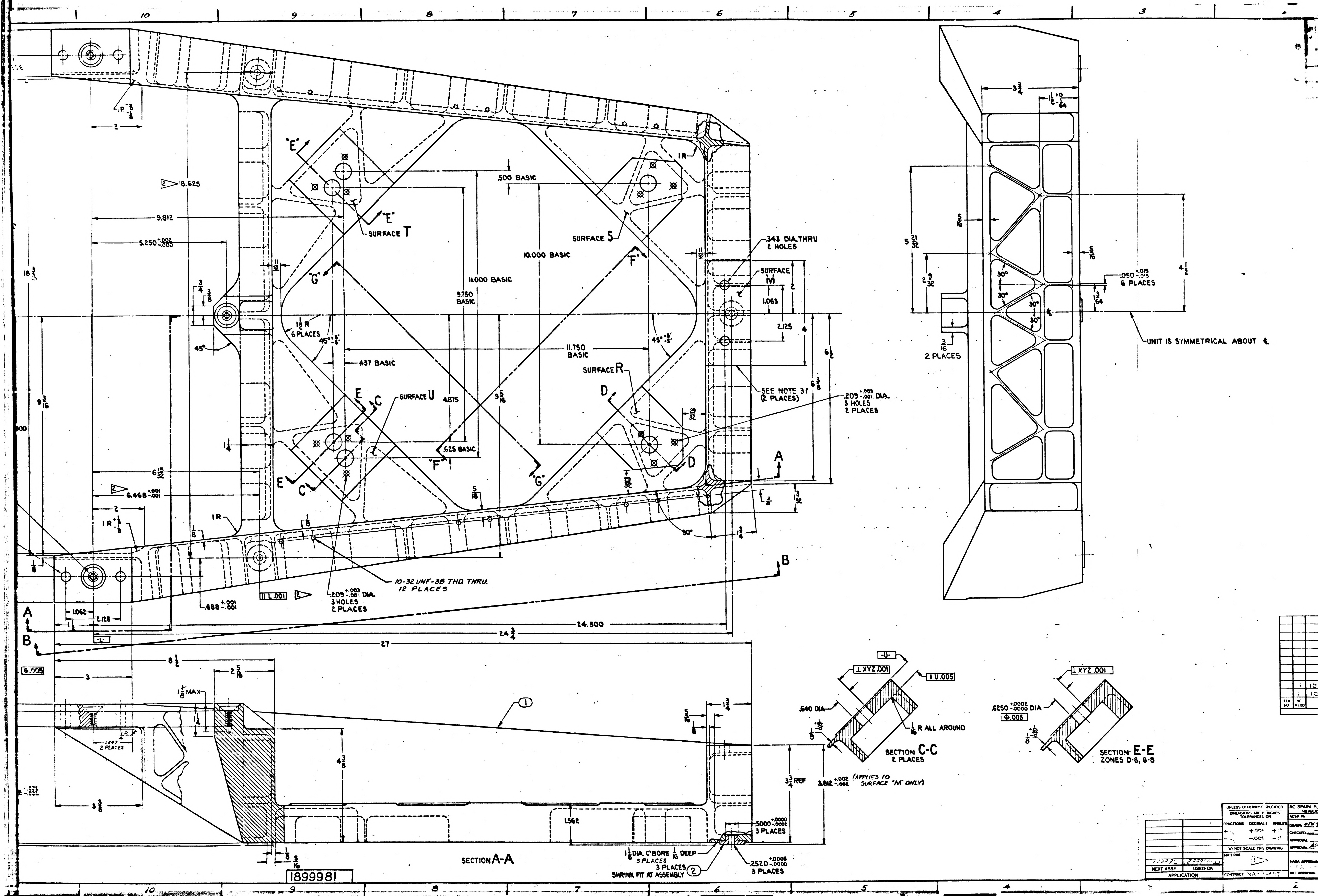
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY,
NAVIGATION BASE

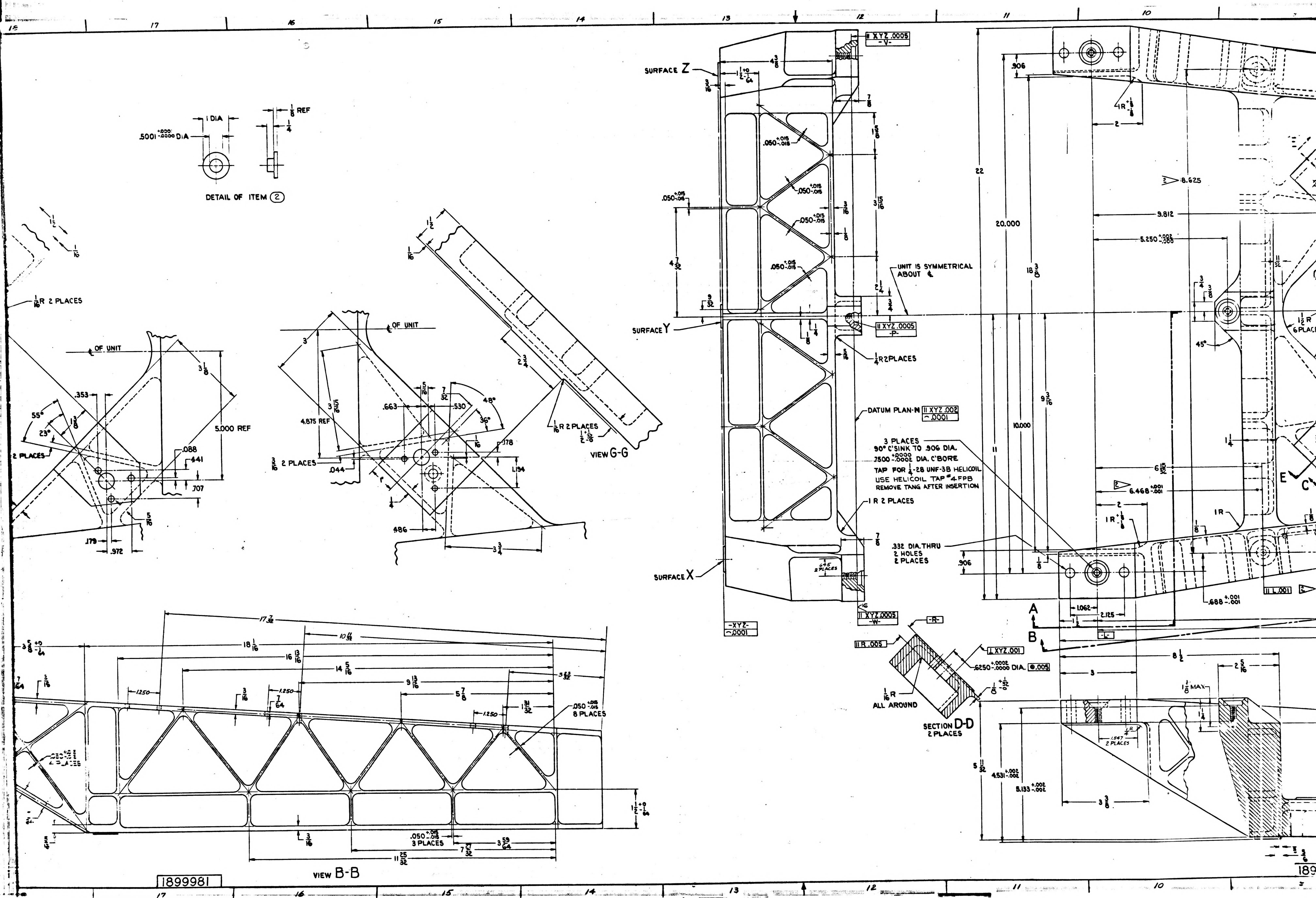
CODE IDENT NO.
SIZE J3
1899981
SCALE 1:1
SHEET

INCHES
PHOTOGRAPHIC SCALE ONLY

F-4



10
9
8
7
6
5
4
3
18.625
9.812
5.250 +.002 -.000
18 3/4
2
P +1/8 -1/8
3/4
3/8
45°
1 1/2 R 6 PLACES
45° ±8'
.437 BASIC
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
4.875
9 5/16
.625 BASIC
SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
"E"
"F"
"G"
E
C
D
1 R
11/32
.343 DIA. THRU 2 HOLES
1.063
2.125
4
6 1/2
6 3/8
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
29/32
9 3/16
1 1/4
6 15/32
6.468 +.001 -.001
1 R +1/8 -0
1 R
5/16
23/32
1 3/32
3/8
90°
1 3/4
A
B
1/8
1.062
2.125
.688 +.001 -.001
11 L .001
10-32 UNF-3B THD. THRU. 12 PLACES
24.500
24 3/4
27
3 3/4
1 1/2 +0 -1/64
5 21/32
2 9/32
5/16
30°
.050 +.015 -.015 6 PLACES
4 1/2
3/64
3/16 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
⊕ .005
8 1/2
3
2 5/16
1 1/8 MAX
1/4
.1547 1/4 R 2 PLACES
3 3/8
4 3/8
①
5/16
1/8
1 3/4
3 3/4 REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
1.562
.5000 +.0000 -.0002 3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
3 PLACES ② SHRINK FIT AT ASSEMBLY
.2520 +.0008 -.0000 3 PLACES
SECTION A-A
1899981
-U-
⊥ XYZ .001
∥ U .005
.640 DIA
1/8 +1/32 -0
1/16 R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION E-E ZONES D-8, G-8
ITEM NO
NO REQD
NEXT ASSY
USED ON
APPLICATION
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS
DECIMALS
ANGLES
+.005
-.005
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497
AC SPARK PL
MILWAUK
ACSP PN
DRAWN
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
INCHES
PHOTOGRAPHIC SCALE ONLY


DETAIL OF ITEM ②
.5001 +.000 -.0000 DIA
1 DIA
1/8 REF
1/4
1/16 R 2 PLACES
℄ OF UNIT
55°
23°
1 3/8
.353
.088
.441
.707
5.000 REF
3 1/8
2 PLACES
.179
.972
5/16
3
3 15/16
4.875 REF
.663
5/16
7/32
.530
48°
36°
.178
1/16
1.194
3/16 2 PLACES
.044
1/4
.486
3 3/4
1 1/2
1/16
2 3/4
1/16 R 2 PLACES
VIEW G-G
SURFACE Z
SURFACE Y
SURFACE X
4 3/8
1 1/2 +0 -1/64
7/8
1 5/8
.050 +.015 -.015
3 15/16
4 7/32
9/32
2 1/4
3/4
1/4 R 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
II XYZ .0005 -V-
II XYZ .0005 -P-
DATUM PLAN-N II XYZ .002 ⌒ .0001
3 PLACES
90° C'SINK TO .906 DIA.
.7500 +.0000 -.0002 DIA. C'BORE
TAP FOR 1/4-28 UNF-3B HELICOIL
USE HELICOIL TAP #4 FPB
REMOVE TANG AFTER INSERTION
1 R 2 PLACES
.332 DIA. THRU
2 HOLES
2 PLACES
-XYZ- ⌒ .0001
II XYZ .0005 -W-
-R-
II R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA. ◎ .005
1/16 R ALL AROUND
SECTION D-D
2 PLACES
.906
22
20.000
18 3/8
10.000
11
9 3/16
8.625
9.812
5.250 +.002 -.000
6 15/32
6.468 +.001 -.001
1 R +1/8
1 1/4
45°
1 1/2 R 6 PLACES
E
C
1 R
.688 +.001 -.001
II L .001
1.062
2.125
A
B
-L-
8 1/2
3
2 5/16
1 1/8 MAX
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 3/8
17 7/32
18 1/16
16 13/16
14 5/16
10 11/32
9 13/16
5 7/8
3 5/8 +0 -1/64
1.250
7/64
3/16
.050 +.015 -.015 8 PLACES
31/32
1 1/2 +0 -1/64
.050 +.015 -.015 3 PLACES
3 59/64
7 27/32
11 25/32
VIEW B-B
1899981
17
16
15
14
13
12
11
10

INCHES
PHOTOGRAPHIC SCALE ONLY

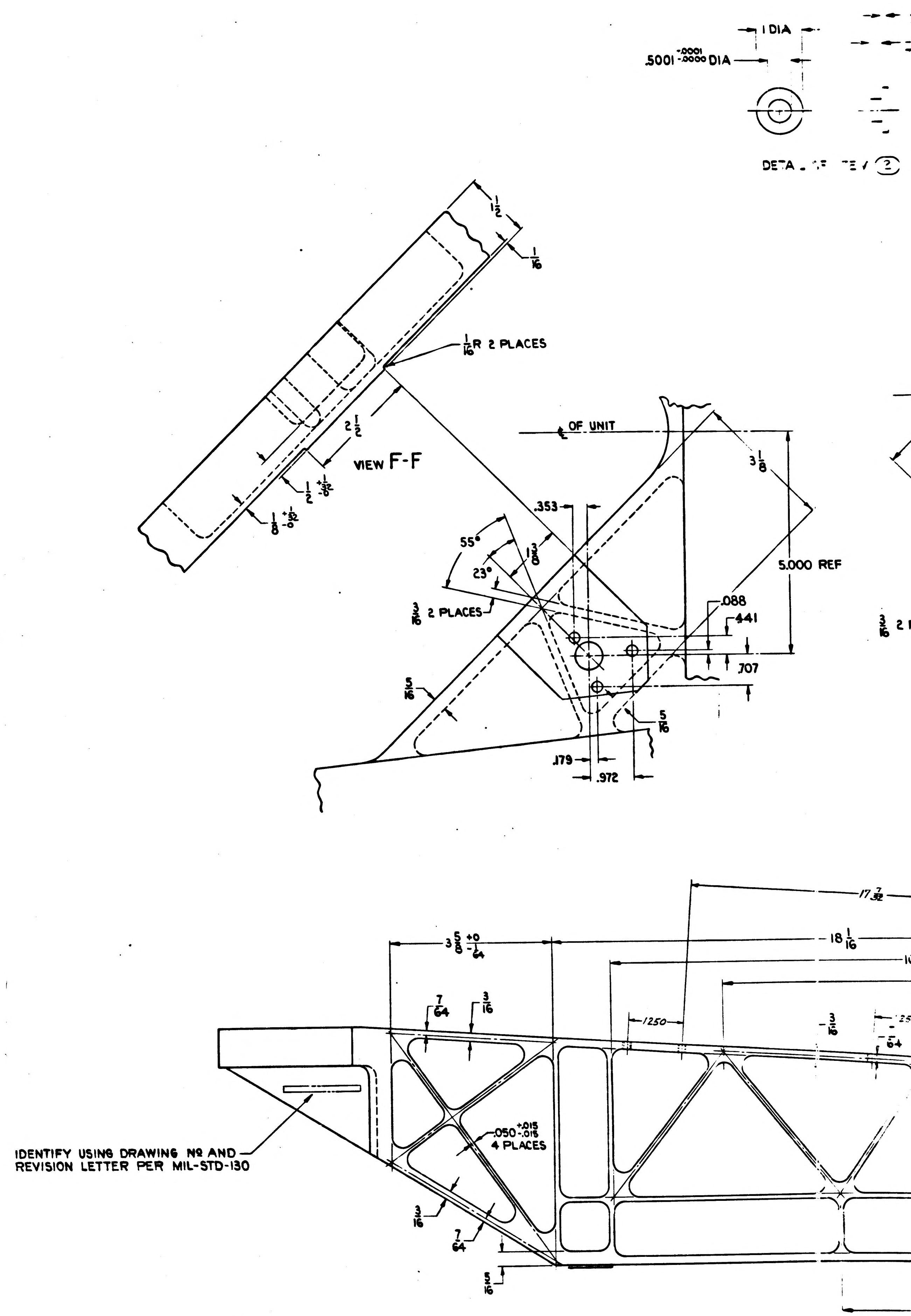
F-2

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

1 ▷ 2. MATERIAL:
   a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
   b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

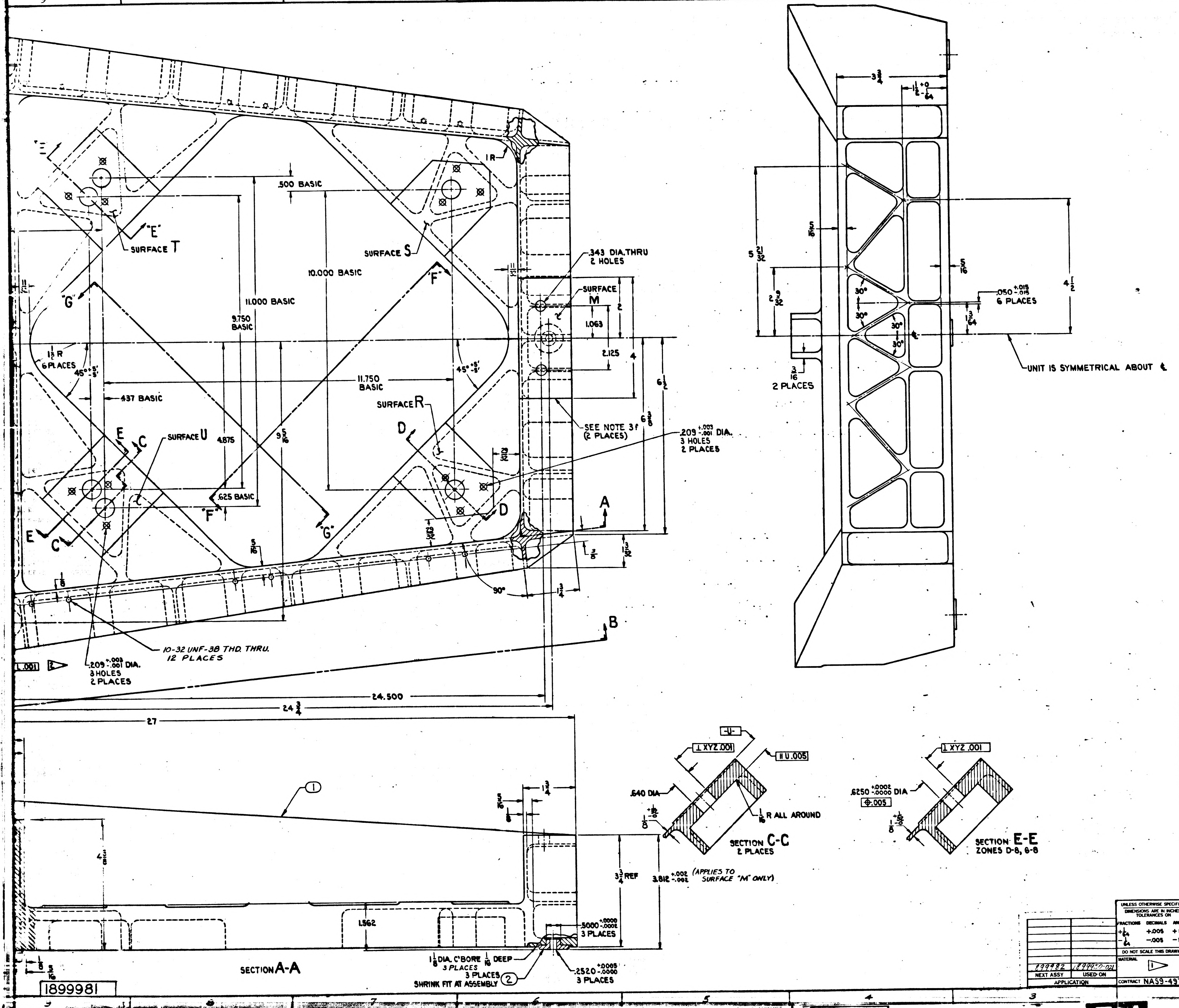
3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED 63√.
      3. ALL FILLETS 1/4 R.
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
   b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   c. SURFACES RST & U TO BE 32√.
   d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
   e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
   f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 3/4 REF DIMENSION

2 ▷ h. APPLIES ONLY TO .2520 DIA. HOLES.


1 DIA
.5001 -.0001 -.0000 DIA
DETAIL OF ITEM ②
1/2
1/16
1/16 R 2 PLACES
2 1/2
VIEW F-F
1/2 +1/32 -0
1/8 +1/32 -0
℄ OF UNIT
3 1/8
.353
55°
23°
1 3/8
3/16 2 PLACES
5.000 REF
.088
.441
.707
5/16
5/16
.179
.972
3/16 2
17 7/32
3 5/8 +0 -1/64
18 1/16
7/64
3/16
.1250
3/16
7/64
IDENTIFY USING DRAWING NO AND REVISION LETTER PER MIL-STD-130
.050 +.015 -.015 4 PLACES
3/16
7/64
5/16

1899981

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY



.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
9 5/16
SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
"E"
"F"
"G"
1R
1 1/2 R 6 PLACES
45° +5' -5'
.343 DIA. THRU 2 HOLES
1.063
2.125
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU. 12 PLACES
.001 2
24.500
24 3/4
27
90°
A
B
C
D
E
3 3/4
1 1/4 +0 -1/64
5 21/32
2 9/32
5/16
4 1/2
.050 +.015 -.015 6 PLACES
30°
1 3/64
3/16 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA
1/16 R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION E-E ZONES D-8, G-8
①
4 3/8
3 3/4 REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
1.562
.5000 +.0000 -.0002 3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
3 PLACES ② SHRINK FIT AT ASSEMBLY
.2520 +.0005 -.0000 3 PLACES
SECTION A-A
1899981

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APP'D
A		UPGRADED FOR CLASS A RELEASE TDRR 01593		6-14 63	G.L.
B		REVISED IN ACCORDANCE WITH TDRR 02266		31 July 63	R.W.G.
C		REVISED IN ACCORDANCE WITH TDRR 02311		31 July 63	RWG
D		REVISED IN ACCORDANCE WITH TDRR 02402		2 Aug 63	R.W.G.
E		REVISED PER TDRR NO. 03191		9 26 63	JAG

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	3	1899981-2	PAD REFERENCE
1	1	1899981-1	BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899982	1899950-021

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL ①

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 7 JUN 63
CHECKED 11 JUN 63
APPROVAL HANN 11 JUN 63
APPROVAL 11 JUN 63
NASA APPROVAL 6-14-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

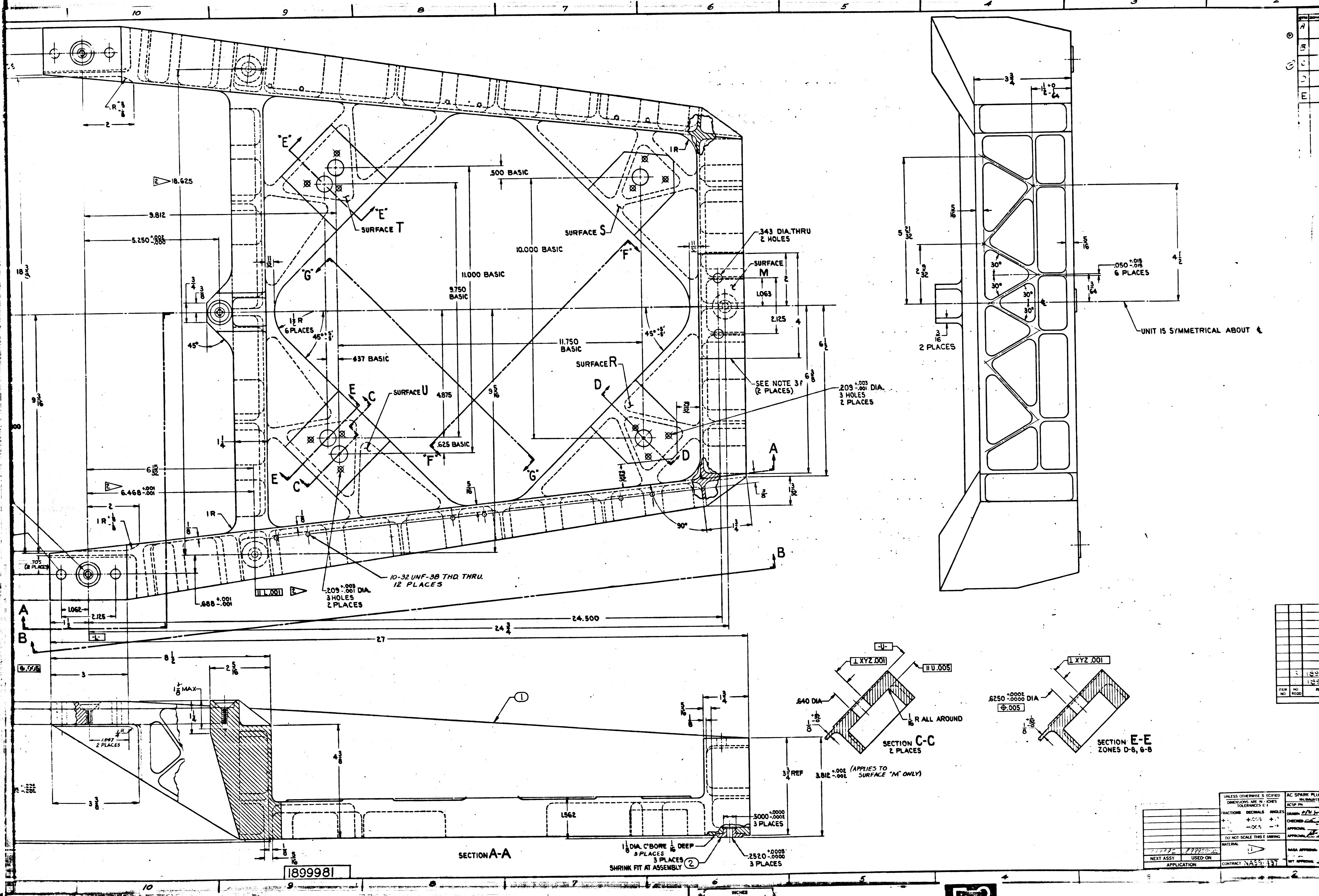
STRUCTURAL ASSY,
NAVIGATION BASE

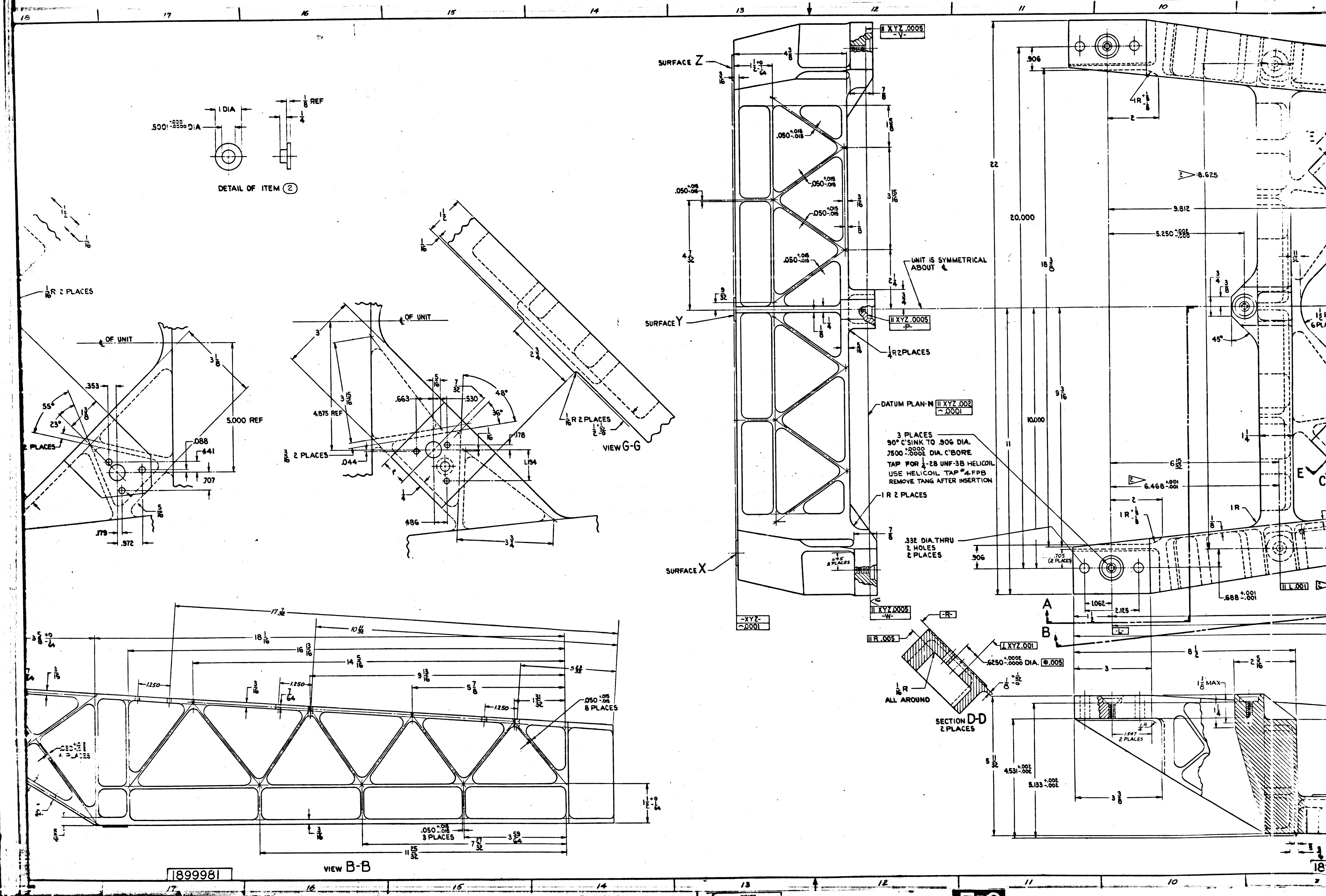
CODE IDENT NO.
SIZE J3
1899981
SCALE 1:1
SHEET

1899981

PHOTOGRAPHIC SCALE ONLY
INCHES

F-4


10
9
8
7
6
5
4
3
2
2 18.625
9.812
5.250 +.002 -.000
18 3/4
9 3/16
6 15/32
2 6.468 +.001 -.001
2
1R +1/8
1R
.688 +.001 -.001
1.062
2.125
1 1/2
.705 (2 PLACES)
45°
3/4
3/8
1 1/2 R 6 PLACES
45° ±5'
.437 BASIC
"E"
"E"
SURFACE T
"G"
"G"
"F"
"F"
.500 BASIC
11.000 BASIC
9.750 BASIC
10.000 BASIC
11.750 BASIC
4.875
9 5/16
.625 BASIC
SURFACE S
SURFACE R
SURFACE U
E
E
C
C
D
D
1R
.343 DIA.THRU 2 HOLES
SURFACE M
1.063
2.125
2
4
6 1/2
6 3/8
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU. 12 PLACES
11 L.001 2
A
A
B
B
90°
1 3/4
1 3/32
3/8
5/16
1/8
1/8
11/32
19/32
24.500
24 3/4
27
-L-
6.005
8 1/2
3
2 5/16
1 1/8 MAX
1 1/4
1.997 2 PLACES
1
4 3/8
3 3/8
5/16
1 3/4
3 3/4 REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
1.562
.5000 +.0000 -.0002 3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
.2520 +.0005 -.0000 3 PLACES
3 PLACES 2 SHRINK FIT AT ASSEMBLY
1/8
5/16
SECTION A-A
1899981
3 3/4
1 1/2 +0 -1/64
5 21/32
5/16
2 9/32
3/16 2 PLACES
5/16
.050 +.015 -.015 6 PLACES
1 3/64
4 1/2
30°
30°
30°
30°
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA.
1/8 +1/32 -0
1/16 R ALL AROUND
SECTION C-C 2 PLACES
⊥ XYZ .001
.6250 +.0002 -.0000 DIA.
⊕ .005
1/8 +1/32 -0
SECTION E-E ZONES D-8, 6-8
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS
DECIMALS
ANGLES
+.005
-.005
DO NOT SCALE THIS DRAWING
MATERIAL
1
NEXT ASSY
USED ON
APPLICATION
CONTRACT NAS9-497
AC SPARK PLU
MILWAUKEE
ACSP PN
DRAWN
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
ITEM NO
NO REQD
INCHES
PHOTOGRAPHIC SCALE ONLY
E3



DETAIL OF ITEM ②
1 DIA
.5001 +.000 -.0000 DIA
1/8 REF
1/4
1/16 R 2 PLACES
℄ OF UNIT
55°
23°
2 PLACES
.353
3/8
3 1/8
5.000 REF
.088
.441
.707
.179
.972
5/16
3
4.875 REF
3 15/16
.663
5/16
7/32
.530
48°
36°
1/16
.178
1.194
3/16 2 PLACES
.044
1/4
.486
3 3/4
1/2
1/16
2 3/4
1/16 R 2 PLACES
VIEW G-G
SURFACE Z
SURFACE Y
SURFACE X
4 3/8
1 1/2 +0 -1/64
3/16
7/8
1 5/8
3 15/16
3/16
1/8
.050 +.015 -.015
4 7/32
9/32
2 1/4
3/4
1/4
1/8
5/16
1/4 R 2 PLACES
II XYZ .0005 -V-
II XYZ .0005 -P-
II XYZ .0005 -W-
-XYZ- ⌒.0001
UNIT IS SYMMETRICAL ABOUT ℄
DATUM PLAN-N II XYZ .002 ⌒.0001
1 R 2 PLACES
3 PLACES
90° C'SINK TO .906 DIA.
.7500 +.0000 -.0002 DIA. C'BORE
TAP FOR 1/4-28 UNF-3B HELICOIL
USE HELICOIL TAP #4 FPB
REMOVE TANG AFTER INSERTION
.332 DIA. THRU
2 HOLES
2 PLACES
.906
22
20.000
18 3/8
10.000
11
9 3/16
18.625
9.812
5.250 +.002 -.000
6 15/32
6.468 +.001 -.001
2
1 R +1/8
45°
1 1/4
.705 (2 PLACES)
1.062
2.125
1 1/2
.688 +.001 -.001
II L .001
A
B
-L-
-R-
II R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA. ⊕.005
1/16 R ALL AROUND
1/8 +1/32
SECTION D-D 2 PLACES
8 1/2
3
2 5/16
1 1/8 MAX
1/4
1.547 2 PLACES
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 3/8
17 7/32
10 11/32
18 1/16
16 13/16
14 5/16
9 13/16
5 7/8
5 63/64
1 31/32
3 5/8 +0 -1/64
1.250
3/16
7/64
.050 +.015 -.015 8 PLACES
1 1/2 +0 -1/64
.050 +.015 -.015 3 PLACES
3/16
7 27/32
3 59/64
11 25/32
VIEW B-B
1899981

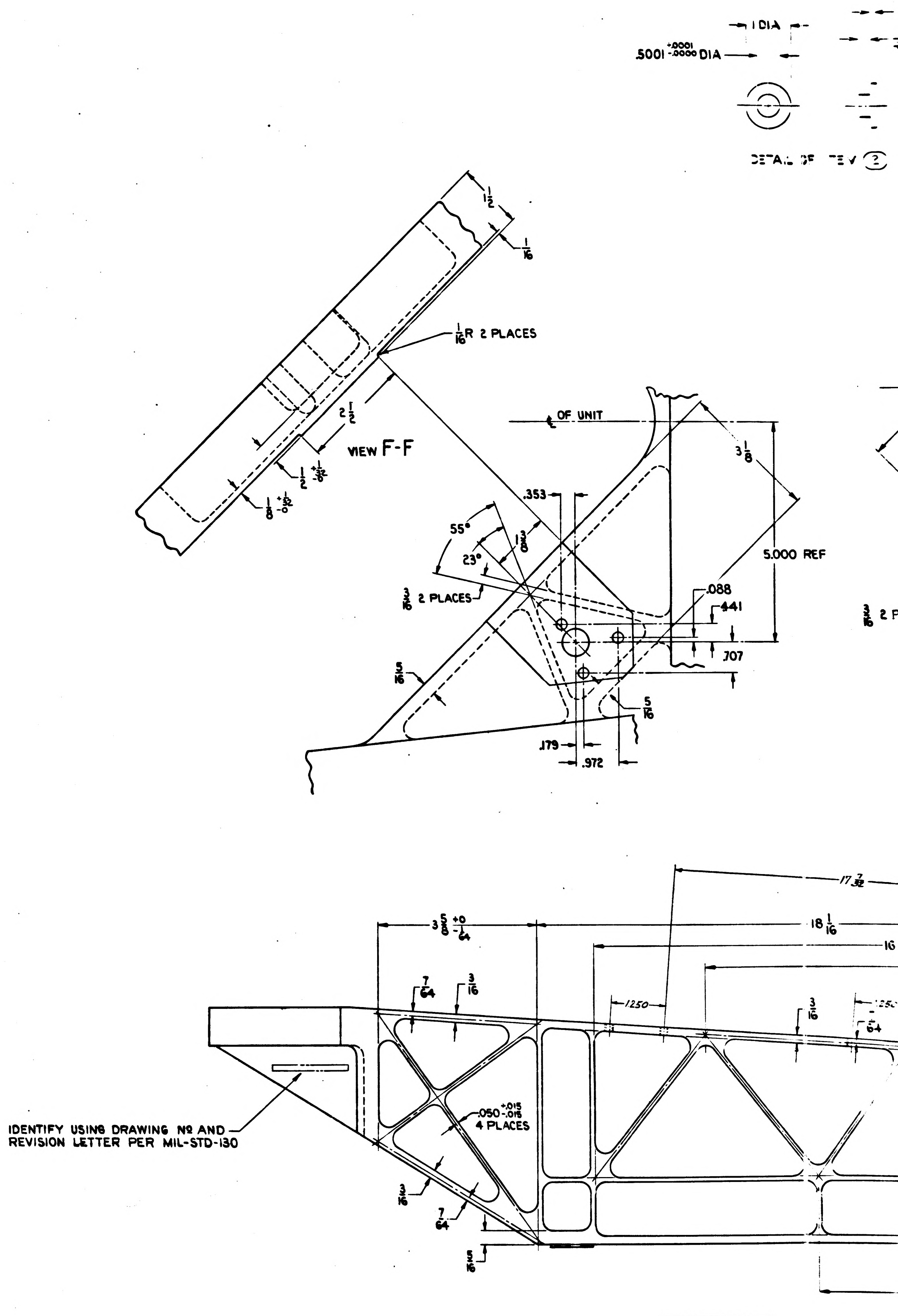
INCHES
PHOTOGRAPHIC SCALE ONLY
F-2

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

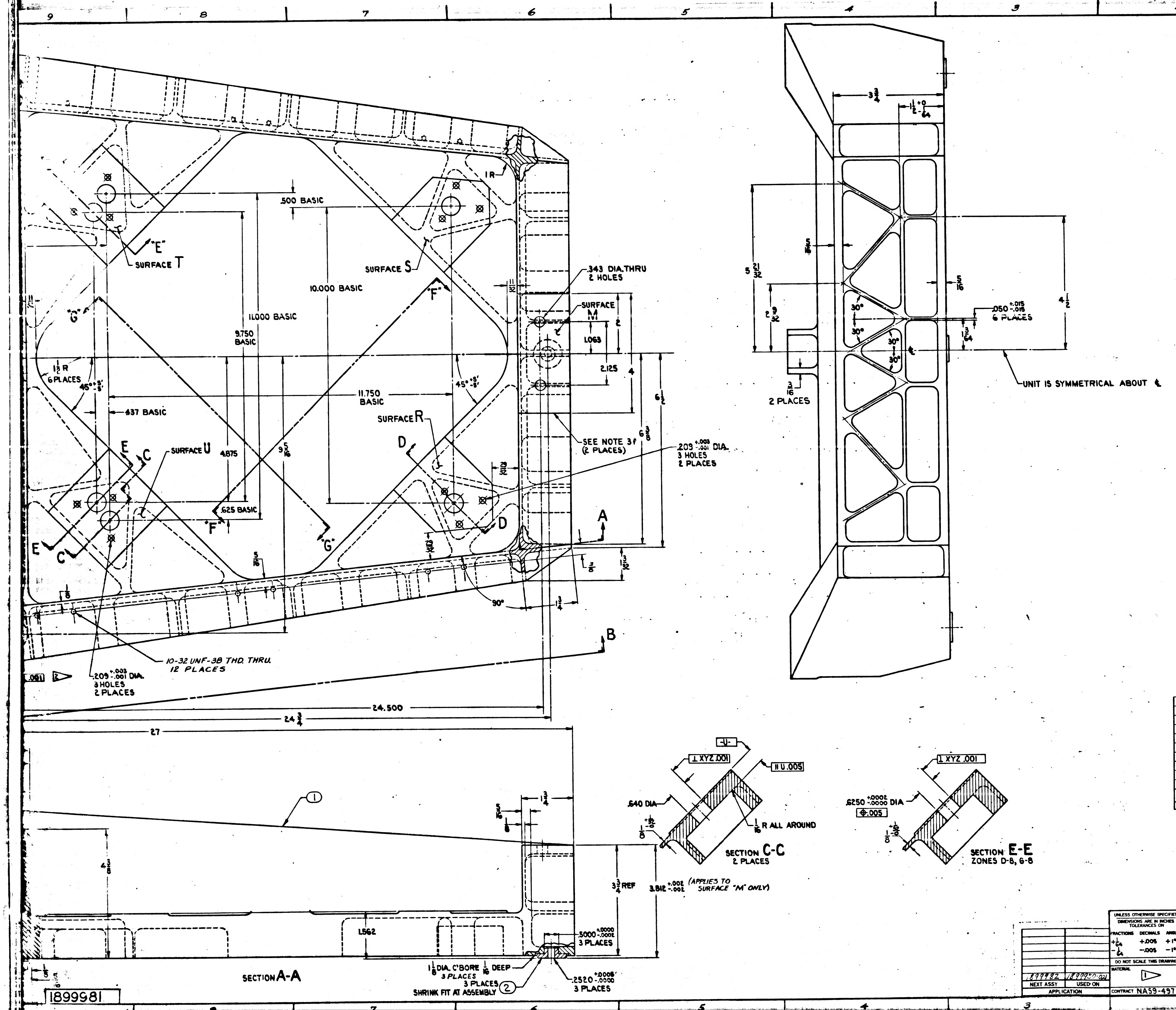
▷1 2. MATERIAL:
  a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
  b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

3. REQUIREMENTS:
  a. UNLESS OTHERWISE SPECIFIED:
    1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
    2. SURFACE ROUGHNESS SHALL NOT EXCEED 63√.
    3. ALL FILLETS 1/4 R.
    4. ALL WEB THICKNESS TO BE .100
    5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
  b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
  c. SURFACES RST & U TO BE 32√.
  d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
  e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
  f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 3/4 REF DIMENSION

▷2 h. APPLIES ONLY TO .2520 DIA. HOLES.


1 DIA
.5001 +.0001 -.0000 DIA
DETAIL OF VIEW ②
1/2
1/16
1/16 R 2 PLACES
2 1/2
VIEW F-F
1/2 +1/32 -0
1/8 +1/32 -0
℄ OF UNIT
3 1/8
.353
55°
23°
1 3/8
3/16 2 PLACES
5.000 REF
.088
.441
.707
5/16
5/16
.179
.972
17 7/32
3 5/8 +0 -1/64
18 1/16
16
7/64
3/16
.1250
3/16
7/64
.050 +.015 -.015 4 PLACES
3/16
7/64
5/16
IDENTIFY USING DRAWING NO AND REVISION LETTER PER MIL-STD-130

1899981


.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
$9\frac{5}{16}$
1R
"E"
SURFACE T
SURFACE S
"F"
"G"
SURFACE R
SURFACE U
$1\frac{1}{2}$R 6 PLACES
45° +5' -5'
E
C
D
A
B
$\frac{11}{32}$
.343 DIA. THRU 2 HOLES
SURFACE M
1.063
2
2.125
4
$6\frac{1}{2}$
$6\frac{3}{8}$
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
$\frac{29}{32}$
$\frac{3}{8}$
$1\frac{3}{32}$
$\frac{5}{16}$
90°
$1\frac{3}{4}$
10-32 UNF-3B THD. THRU. 12 PLACES
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
.001
24.500
$24\frac{3}{4}$
27
①
$4\frac{3}{8}$
$\frac{5}{16}$
$1\frac{3}{4}$
$3\frac{3}{4}$ REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
1.562
.5000 +.0000 -.0002 3 PLACES
$1\frac{1}{8}$ DIA. C'BORE $\frac{1}{16}$ DEEP 3 PLACES
3 PLACES SHRINK FIT AT ASSEMBLY ②
.2520 +.0008 -.0000 3 PLACES
SECTION A-A
1899981
$3\frac{3}{4}$
$1\frac{1}{2}$ +0 -$\frac{1}{64}$
$5\frac{21}{32}$
$\frac{5}{16}$
$2\frac{9}{32}$
30°
$\frac{3}{16}$ 2 PLACES
.050 +.015 -.015 6 PLACES
$\frac{3}{64}$
$4\frac{1}{2}$
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA
$\frac{1}{8}$ +$\frac{1}{32}$ -0
$\frac{1}{16}$ R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA
⊕ .005
⊥ XYZ .001
SECTION E-E ZONES D-8, 6-8

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		UPGRADED FOR CLASS A RELEASE TDRR 01593		6-14 63	E.L.
B		REVISED IN ACCORDANCE WITH TDRR 02266		31 July 63	R.W.G.
C		REVISED IN ACCORDANCE WITH TDRR 02311		31 July 63	R.W.G.
D		REVISED IN ACCORDANCE WITH TDRR 02402		12 AUG 63	R.W.G.
E		REVISED PER TDRR NO. 03191		9-26 63	
F 3		REVISED PER TDRR NO. 03310		10/63	

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	3	1899981-2	PAD REFERENCE
1	1	1899981-1	BASE

LIST OF PARTS AND MATERIALS

1899981 | 3

NEXT ASSY	USED ON
1899982	1899950-021

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+1°
$-\frac{1}{64}$	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL ①

CONTRACT NAS9-497

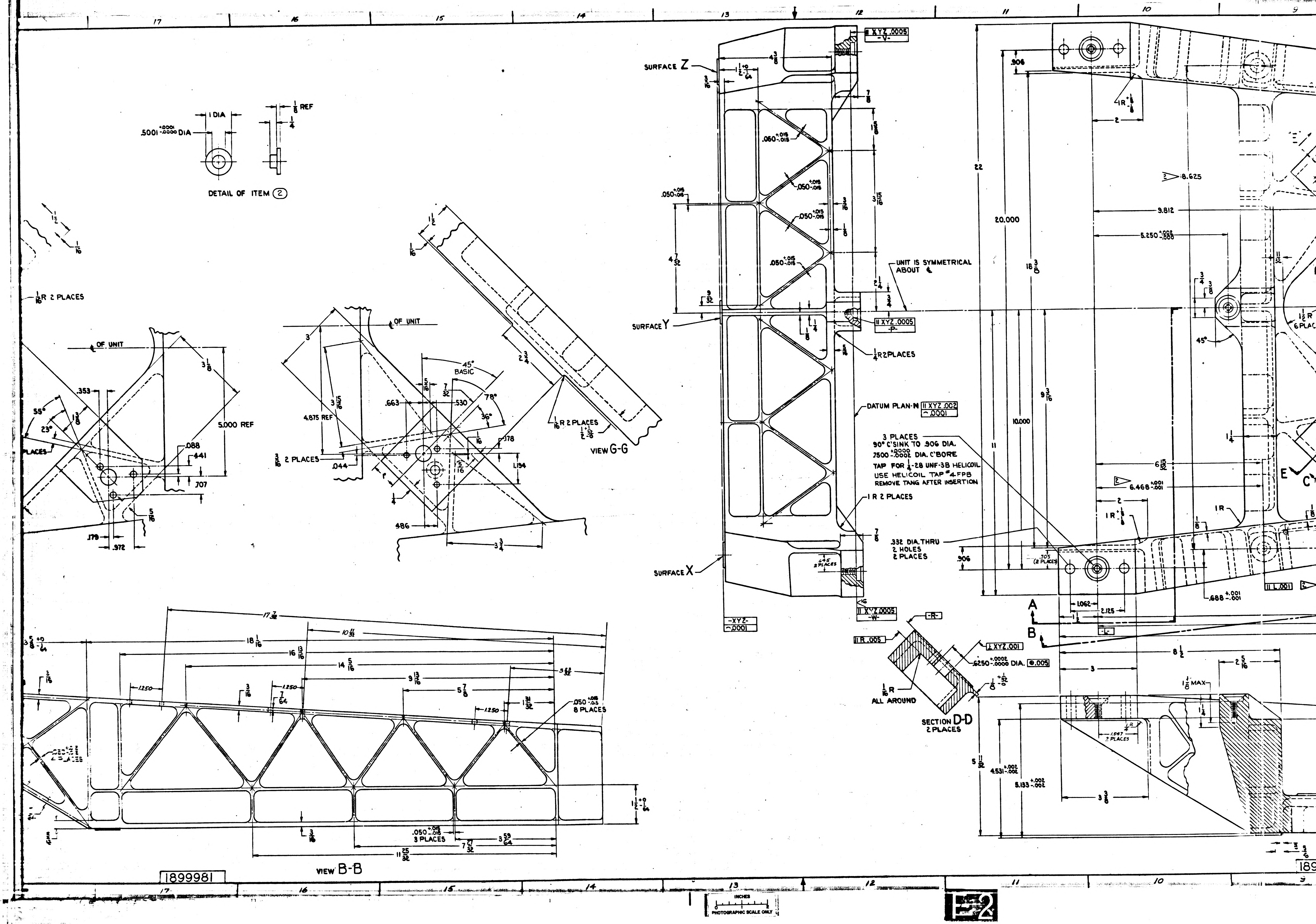
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 7 JUN 63
CHECKED 11 JUN 63
APPROVAL HANN 11 JUN 63
APPROVAL 11 JUN 63
NASA APPROVAL 6-14-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY, NAVIGATION BASE

CODE IDENT NO.
SIZE J3
1899981
SCALE 1:1
SHEET

F-4

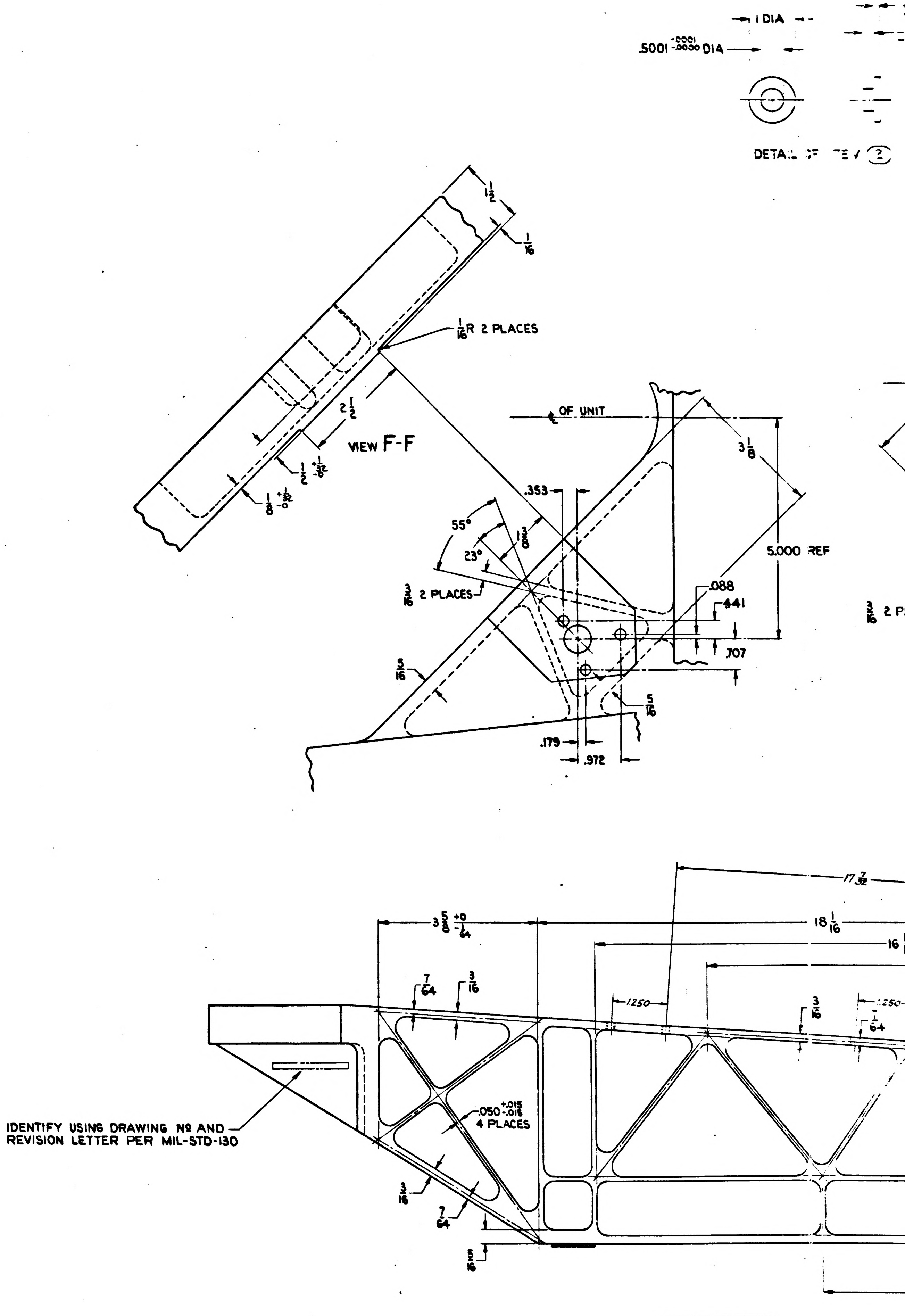

17
16
15
14
13
12
11
10
9
DETAIL OF ITEM ②
.5001 +.0001 -.0000 DIA
1 DIA
1/8 REF
1/4
1/16 R 2 PLACES
℄ OF UNIT
3 1/8
5.000 REF
.353
55°
23°
1 3/8
.088
.441
.707
5/16
.179
.972
3
3 15/16
4.875 REF
.663
45° BASIC
78°
36°
.530
5/16
7/32
1/16
.178
1.194
5/16
3/16 2 PLACES
.044
1/4
.486
3 3/4
1 1/2
1/16
2 3/4
1/16 R 2 PLACES
1/2 +1/32 -0
VIEW G-G
SURFACE Z
SURFACE Y
SURFACE X
4 3/8
1 1/2 +0 -1/64
3/16
7/8
1 5/8
.050 +.015 -.015
3 15/16
4 7/32
9/32
3/16
1/8
2 1/4
3/4
1 1/4
1/8
5/16
1/4 R 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
II XYZ .0005 -V-
II XYZ .0005 -P-
II XYZ .0005 -W-
-XYZ- ⌒.0001
DATUM PLAN-N II XYZ .002 ⌒.0001
1 R 2 PLACES
3 PLACES 90° C'SINK TO .906 DIA. .7500 +.0000 -.0002 DIA. C'BORE TAP FOR 1/4-28 UNF-3B HELICOIL USE HELICOIL TAP #4FPB REMOVE TANG AFTER INSERTION
.332 DIA. THRU 2 HOLES 2 PLACES
.645 2 PLACES
22
20.000
18 3/8
10.000
11
9 3/16
.906
.705 (2 PLACES)
1R +1/8
2
18.625
9.812
5.250 +.002 -.000
11/32
3/4
3/8
45°
1 1/2 R 6 PLACES
1 1/4
6 15/32
6.468 +.001 -.001
1R
1/8
.688 +.001 -.001
II L .001
E
C
A
B
1.062
1 1/2
2.125
-L-
-R-
II R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA. ⊚ .005
1/8 +1/32 -0
1/16 R ALL AROUND
SECTION D-D 2 PLACES
8 1/2
3
2 5/16
1 1/8 MAX
1 1/4
1/4 R
1.547 2 PLACES
5 11/32
4.531 +.002 -.002
5.133 +.002 -.002
3 3/8
17 7/32
18 1/16
10 11/32
16 13/16
14 5/16
9 13/16
5 7/8
5 63/32
3 5/8 +0 -1/64
3/16
1.250
3/16
7/64
1.250
31/32
.050 +.015 -.015 8 PLACES
1 1/2 +0 -1/64
3/16
.050 +.015 -.015 3 PLACES
7 27/32
3 59/64
11 25/32
VIEW B-B
1899981
INCHES
PHOTOGRAPHIC SCALE ONLY
E2

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

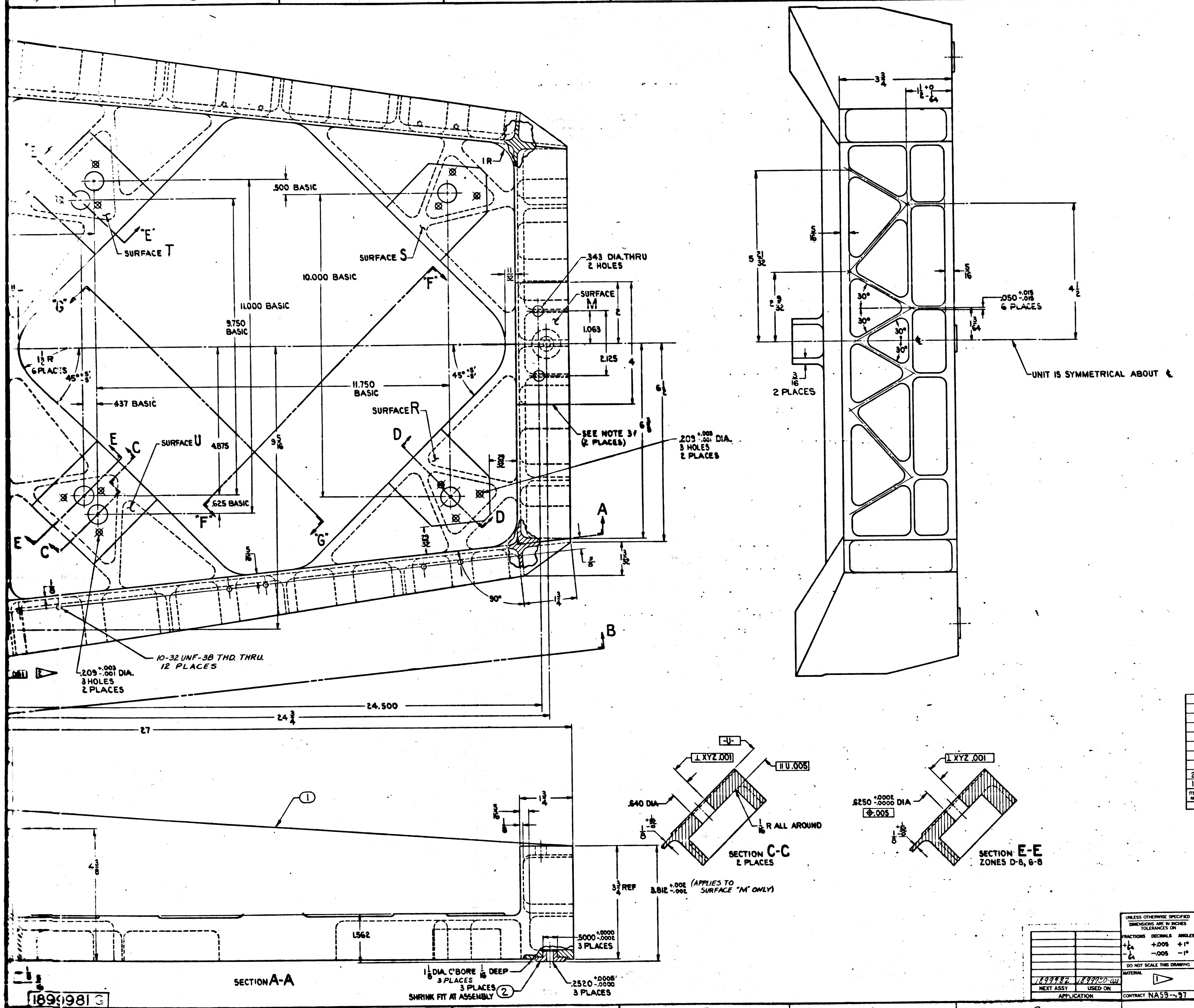
1 2. MATERIAL:
   a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
   b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED 63√.
      3. ALL FILLETS ¼ R.
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
   b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   c. SURFACES RST & U TO BE 32√.
   d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
   e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
   f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3¾ REF DIMENSION

2 h. APPLIES ONLY TO .2520 DIA. HOLES.



1 DIA
.5001 -.0001 -.0000 DIA
DETAIL OF ITEM 2
½
1/16
1/16 R 2 PLACES
2½
VIEW F-F
½ +1/32
⅛ +1/16 -0
℄ OF UNIT
3⅛
.353
55°
23°
1⅜
3/16 2 PLACES
5.000 REF
.088
.441
.707
5/16
5/16
.179
.972
3/16 2 P
17 7/32
3 5/8 +0 -1/64
18 1/16
16
7/64
3/16
.1250
3/16
.1250
1/64
.050 +.015 -.015 4 PLACES
3/16
7/64
5/16
IDENTIFY USING DRAWING NO AND REVISION LETTER PER MIL-STD-130


SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
"E"
"F"
"G"
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
1R
1½ R 6 PLACES
45° +5' -5'
.343 DIA. THRU 2 HOLES
1.063
2.125
SEE NOTE 31 (2 PLACES)
.203 +.003 -.001 DIA. 3 HOLES 2 PLACES
10-32 UNF-3B THD. THRU. 12 PLACES
24.500
24¾
27
90°
A
B
C
D
E
UNIT IS SYMMETRICAL ABOUT ℄
.050 +.015 -.015 6 PLACES
30°
3/16 2 PLACES
SECTION A-A
1 1/16 DIA. C'BORE 1/16 DEEP 3 PLACES
3 PLACES SHRINK FIT AT ASSEMBLY ②
.2520 +.0005 -.0000 3 PLACES
.5000 +.0000 -.0002 3 PLACES
1.562
3¾ REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
①
SECTION C-C 2 PLACES
.640 DIA
1/16 R ALL AROUND
⊥ XYZ .001
∥ U .005
-U-
SECTION E-E ZONES D-8, G-8
.6250 +.0002 -.0000 DIA
⊕ .005
1899981 G

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		UPGRADED FOR CLASS A RELEASE TDRR 01593.		6-14 63	E.L. / WK
B		REVISED IN ACCORDANCE WITH TDRR 02266		31 July 63	R.W.G.
C		REVISED IN ACCORDANCE WITH TDRR 02311		31 July 63	RWG / WK
D		REVISED IN ACCORDANCE WITH TDRR 02402		12 AUG 63	R.W.G. / WR
E		REVISED PER TDRR NO. 03191		9/26/63	JMB
F3		REVISED PER TDRR NO. 03310		10/1/63	WK.
G2		REVISED PER TDRR NO 03672		2 OCT 63	WA

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	3	1899981-2	PAD REFERENCE
1	1	1899981-1	BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899982	1899950-021

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
-1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL ①

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 7 JUN 63
CHECKED 11 JUN 63
APPROVAL HANN 11 JUN 63
APPROVAL 11 JUN 63
NASA APPROVAL 6-16-63
MIT APPROVAL

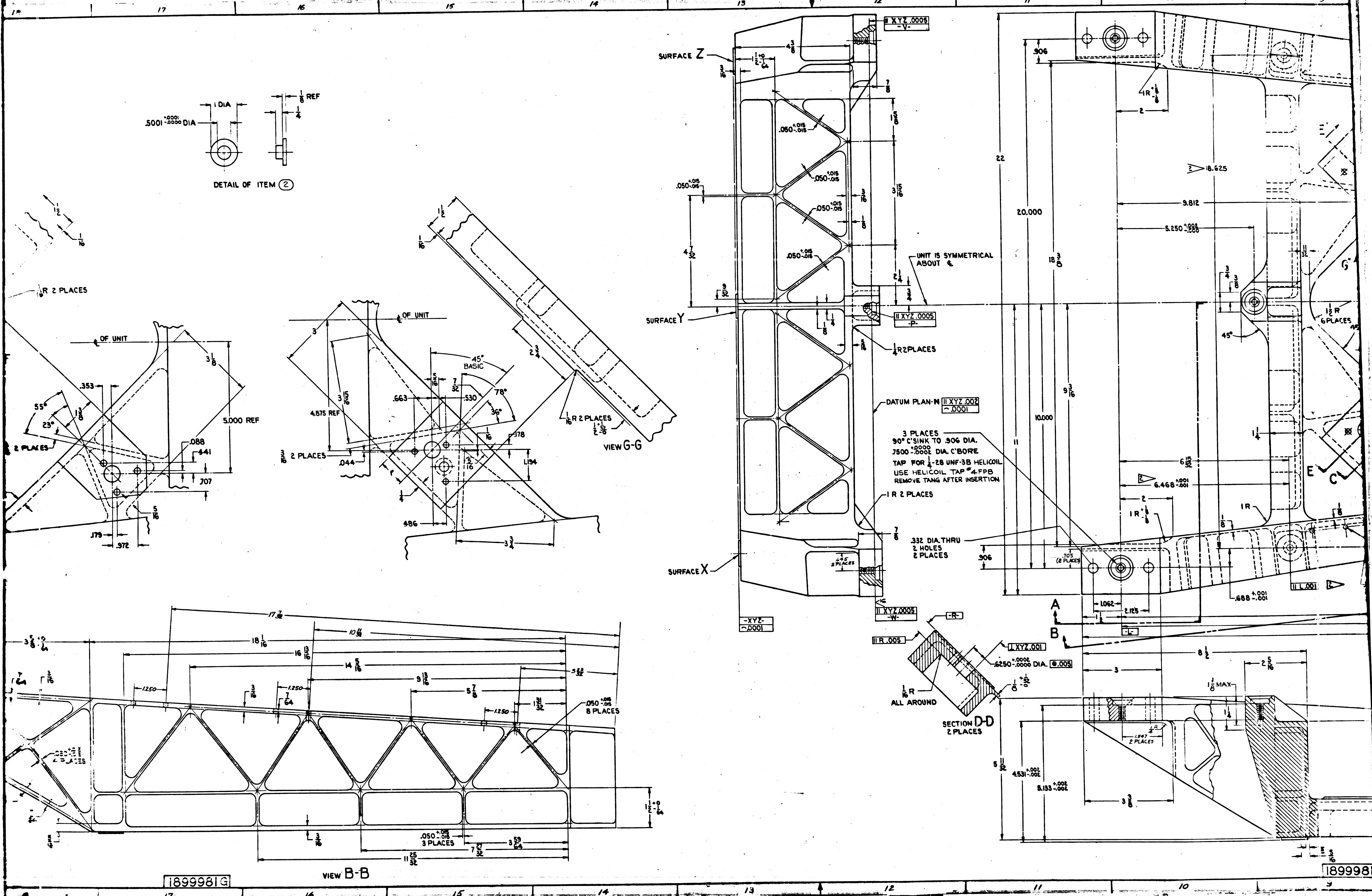
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

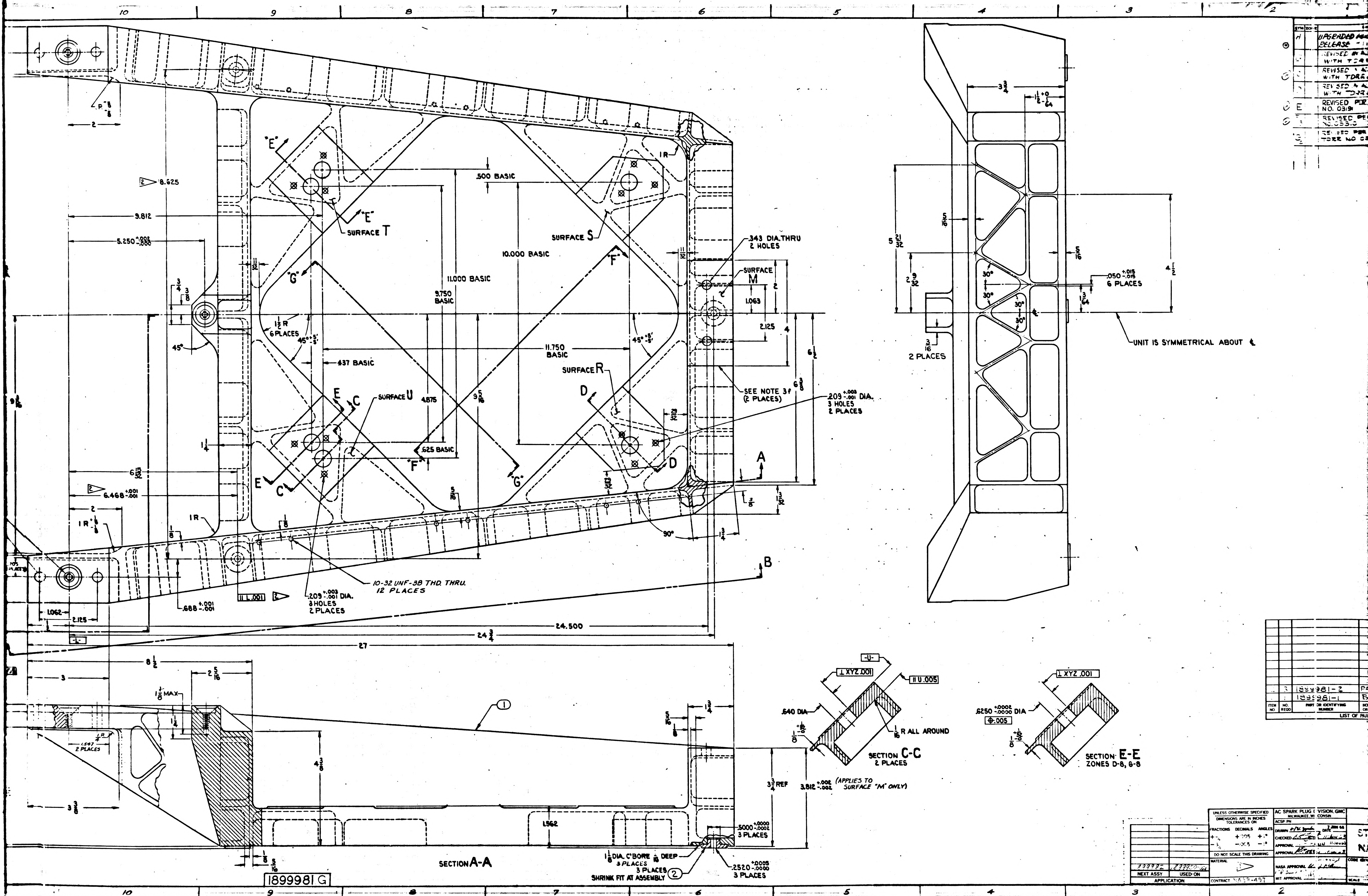
STRUCTURAL ASSY,
NAVIGATION BASE

CODE IDENT NO.
SIZE J3
1899981
SCALE 1:1
SHEET

1899981

F-4


DETAIL OF ITEM ②
.5001 +.0001 -.0000 DIA
1 DIA
1/8 REF
1/4
1/16 R 2 PLACES
℄ OF UNIT
5.000 REF
4.875 REF
45° BASIC
VIEW G-G
1/16 R 2 PLACES
SURFACE Z
SURFACE Y
SURFACE X
.050 +.015 -.015
UNIT IS SYMMETRICAL ABOUT ℄
DATUM PLAN-N ∥ XYZ .002 ⌒ .0001
∥ XYZ .0005 -V-
∥ XYZ .0005 -P-
∥ XYZ .0005 -W-
-XYZ- ⌒ .0001
1/4 R 2 PLACES
1 R 2 PLACES
3 PLACES
90° C'SINK TO .906 DIA.
.7500 +.0000 -.0002 DIA. C'BORE
TAP FOR 1/4-28 UNF-3B HELICOIL
USE HELICOIL TAP #4 FPB
REMOVE TANG AFTER INSERTION
.332 DIA. THRU
2 HOLES
2 PLACES
18.625
9.812
5.250 +.002 -.000
6.468 +.001 -.001
.688 +.001 -.001
20.000
10.000
22
∥ L .001
1 1/2 R 6 PLACES
45°
A
B
-L-
-R-
∥ R .005
⊥ XYZ .001
.6250 +.0002 -.0000 DIA. ⊕ .005
1/16 R ALL AROUND
SECTION D-D
2 PLACES
1 1/8 MAX
4.531 +.002 -.002
5.133 +.002 -.002
.050 +.015 -.015 8 PLACES
.050 +.015 -.015 3 PLACES
VIEW B-B
17 7/32
18 1/16
16 13/16
14 5/16
10 11/32
9 13/16
5 7/8
11 25/32
7 27/32
3 59/64
1.250
E
C
G
1899981G
PHOTOGRAPHIC SCALE ONLY
INCHES



10
9
8
7
6
5
4
3
2
"E"
"E"
SURFACE T
.500 BASIC
SURFACE S
1R
8.625
9.812
5.250 +.002 -.000
11.000 BASIC
10.000 BASIC
9.750 BASIC
"G"
"F"
.343 DIA.THRU 2 HOLES
SURFACE M
1.063
2.125
$\frac{11}{32}$
$\frac{3}{4}$
$\frac{3}{8}$
$1\frac{1}{2}$R 6 PLACES
45°
45° +5' -5'
.437 BASIC
11.750 BASIC
SURFACE R
SEE NOTE 3f (2 PLACES)
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
SURFACE U
4.875
$9\frac{5}{16}$
$9\frac{3}{16}$
$1\frac{1}{4}$
.625 BASIC
$6\frac{15}{32}$
6.468 +.001 -.001
1R
$\frac{5}{16}$
$\frac{1}{8}$
90°
$\frac{3}{8}$
$1\frac{3}{32}$
$1\frac{3}{4}$
$6\frac{1}{2}$
$6\frac{3}{8}$
$\frac{29}{32}$
$\frac{13}{32}$
A
B
C
D
E
"F"
"G"
10-32 UNF-3B THD. THRU. 12 PLACES
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
⊥ L .001
.688 +.001 -.001
1.062
2.125
24.500
$24\frac{3}{4}$
27
$8\frac{1}{2}$
3
$2\frac{5}{16}$
$1\frac{1}{8}$ MAX
$1\frac{1}{4}$
1.547 2 PLACES
$4\frac{3}{8}$
$3\frac{3}{8}$
①
$\frac{5}{16}$
$1\frac{3}{4}$
$3\frac{3}{4}$ REF
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
1.562
.5000 +.0000 -.0002 3 PLACES
$1\frac{1}{8}$ DIA. C'BORE $\frac{1}{16}$ DEEP 3 PLACES
.2520 +.0005 -.0000 3 PLACES
SHRINK FIT AT ASSEMBLY ②
SECTION A-A
$\frac{5}{16}$
$3\frac{3}{4}$
$1\frac{1}{2}$ +0 -$\frac{1}{64}$
$5\frac{21}{32}$
$\frac{5}{16}$
$2\frac{9}{32}$
30°
.050 +.015 -.015 6 PLACES
$1\frac{3}{64}$
$4\frac{1}{2}$
$\frac{3}{16}$ 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA.
$\frac{1}{16}$ R ALL AROUND
SECTION C-C 2 PLACES
⊥ XYZ .001
.6250 +.0002 -.0000 DIA
⊕ .005
SECTION E-E ZONES D-8, 6-8
1899981 G
INCHES
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	
H		UPGRADED [illegible] RELEASE - [illegible]
		REVISED [illegible] WITH TDR[illegible]
		REVISED [illegible] WITH TDR[illegible]
		REVISED [illegible] WITH TDR[illegible]
E		REVISED PER NO. 03191
		REVISED PE[illegible] NO. 033.0
		REVISED PER TDRR NO [illegible]

3		1899981-2	
		1899981-1	
ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	
LIST OF PARTS			

1899982	1899950-021
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± $\frac{1}{64}$	±.005	±1°

DO NOT SCALE THIS DRAWING

MATERIAL 1

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 7 JUN 63

CHECKED

APPROVAL

APPROVAL

NASA APPROVAL

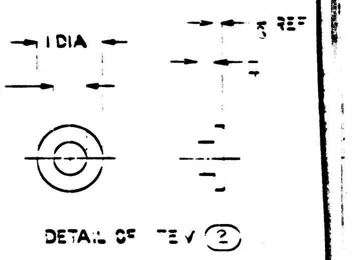
MIT APPROVAL

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

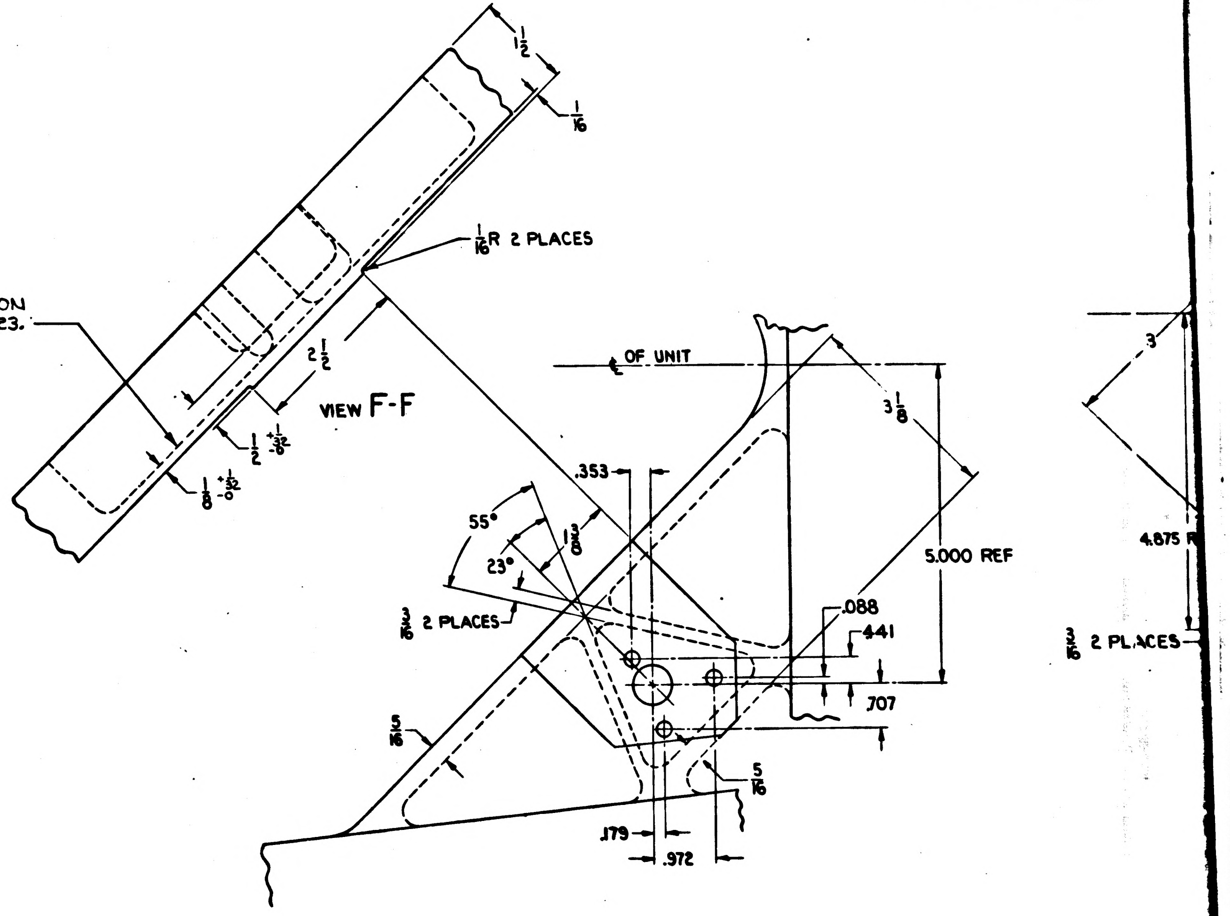
① 2. MATERIAL:
   a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
   b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED 63/.
      3. ALL FILLETS 1/4 R.
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
   b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   c. SURFACES RST & U TO BE 32/.
   d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
   e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
   f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW 3 3/4 REF DIMENSION

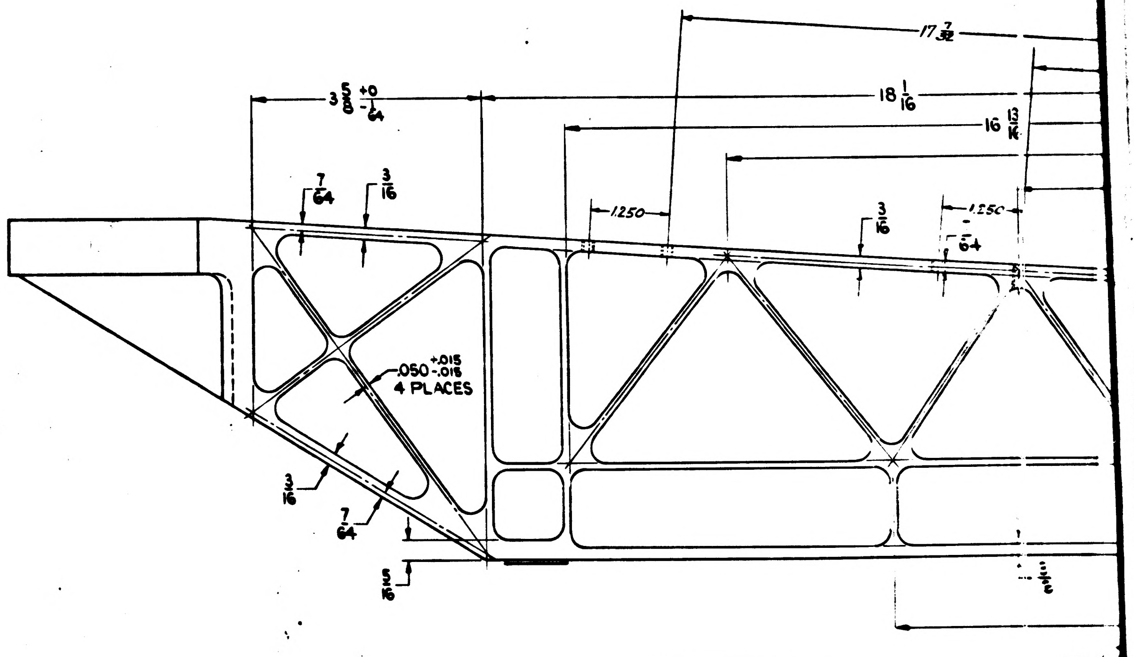
② h. APPLIES ONLY TO .2520 DIA. HOLES.



1 DIA
.5001 +.0001 -.0000 DIA
3 REF
DETAIL OF ITEM ②



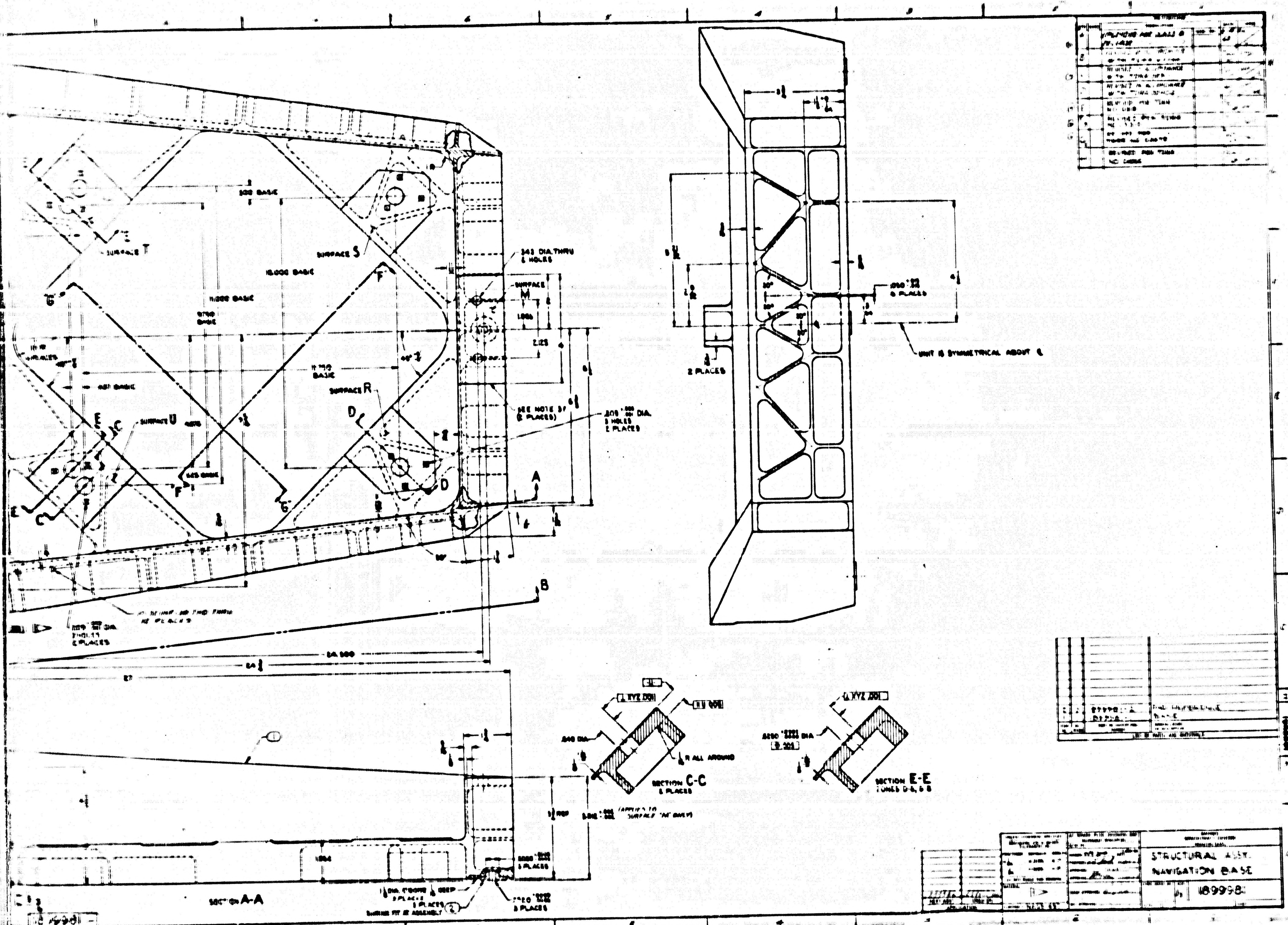
IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND 1002023.
1/2
1/16
1/16 R 2 PLACES
2 1/2
VIEW F-F
1/2 +1/32 -0
1/8 +1/32 -0
℄ OF UNIT
3 1/8
.353
55°
23°
1 3/8
3/16 2 PLACES
5.000 REF
.088
.441
.707
5/16
5/16
.179
.972
3
4.875 R
3/16 2 PLACES



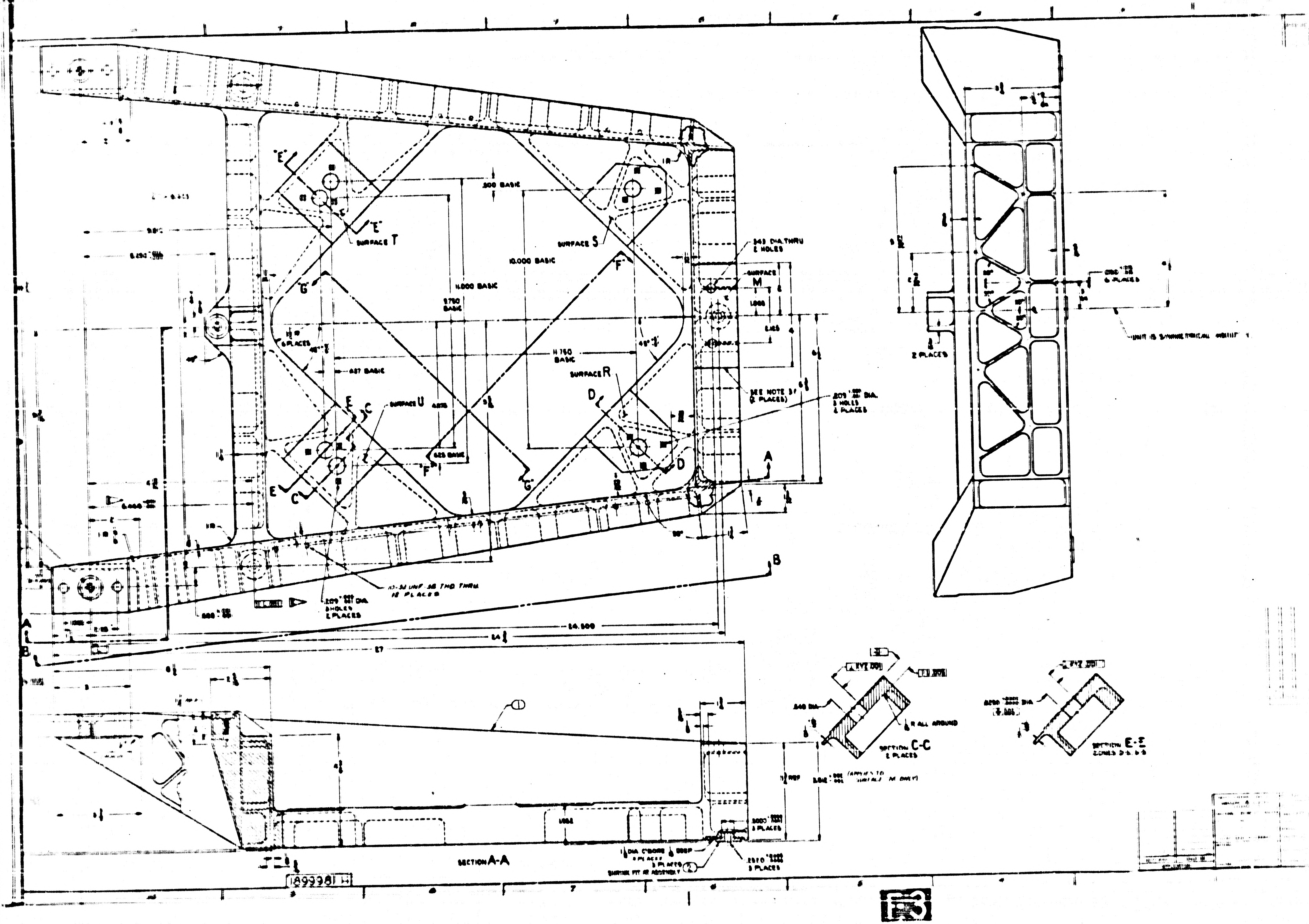
17 7/32
3 5/8 +0 -1/64
18 1/16
16 13/16
7/64
3/16
1.250
1.250
3/16
1/64
.050 +.015 -.015 4 PLACES
3/16
7/64
5/16

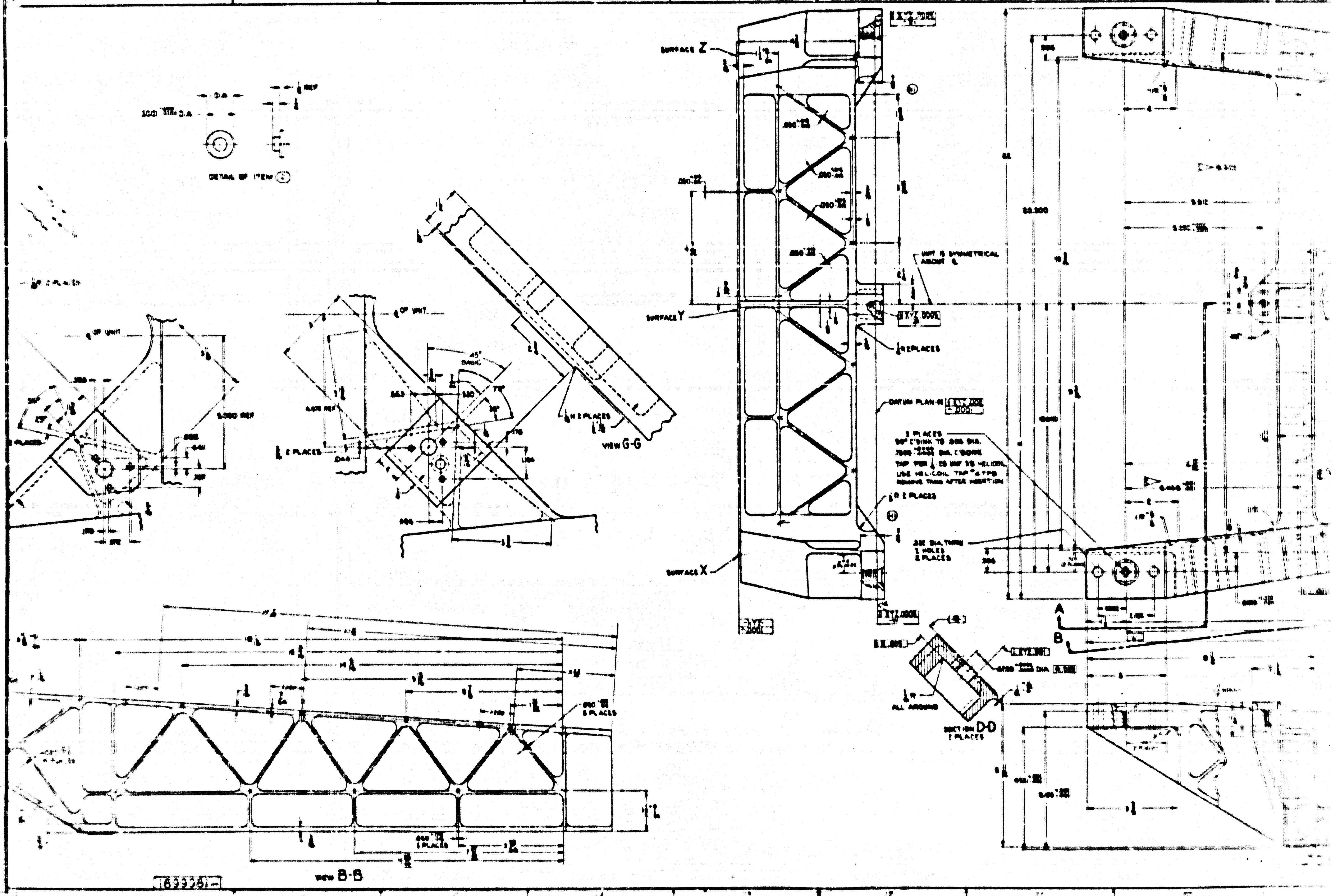
1899981G

INCHES
PHOTOGRAPHIC SCALE ONLY


SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
.500 BASIC
16.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.481 BASIC
.343 DIA. THRU 2 HOLES
SEE NOTE 3 (2 PLACES)
.209 DIA. 3 HOLES 2 PLACES
2.125
1.000
A
B
C
D
E
F
G
30°
2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
SECTION C-C 2 PLACES
SECTION E-E
R ALL AROUND
SECTION A-A
2 PLACES
3 PLACES
BUSHING FIT AT ASSEMBLY
STRUCTURAL ASSY.
NAVIGATION BASE
189998
SOUVENIR PER TIME
NO CHANGE

F-4


"E"
"E"
SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
.500 BASIC
10.000 BASIC
11.000 BASIC
11.750 BASIC
9.750 BASIC
.437 BASIC
.625 BASIC
"F"
"G"
48°
.343 DIA.THRU 2 HOLES
1.000
2.125
SEE NOTE 3/ (2 PLACES)
.209 DIA. 3 HOLES 2 PLACES
.209 DIA. 3 HOLES 2 PLACES
10-32 UNF-2B THD THRU 12 PLACES
6 PLACES
C
D
E
A
B
24.500
24
27
90°
UNIT IS SYMMETRICAL ABOUT
2 PLACES
6 PLACES
SECTION A-A
1 DIA C'BORE DEEP 3 PLACES
3 PLACES ②
SHRINK FIT AT ASSEMBLY
.5000 3 PLACES
.2510 3 PLACES
REF
(APPLIES TO SURFACE M ONLY)
.343 DIA.
R ALL AROUND
SECTION C-C 2 PLACES
SECTION E-E ZONES
.6250 DIA.
①
189998 H

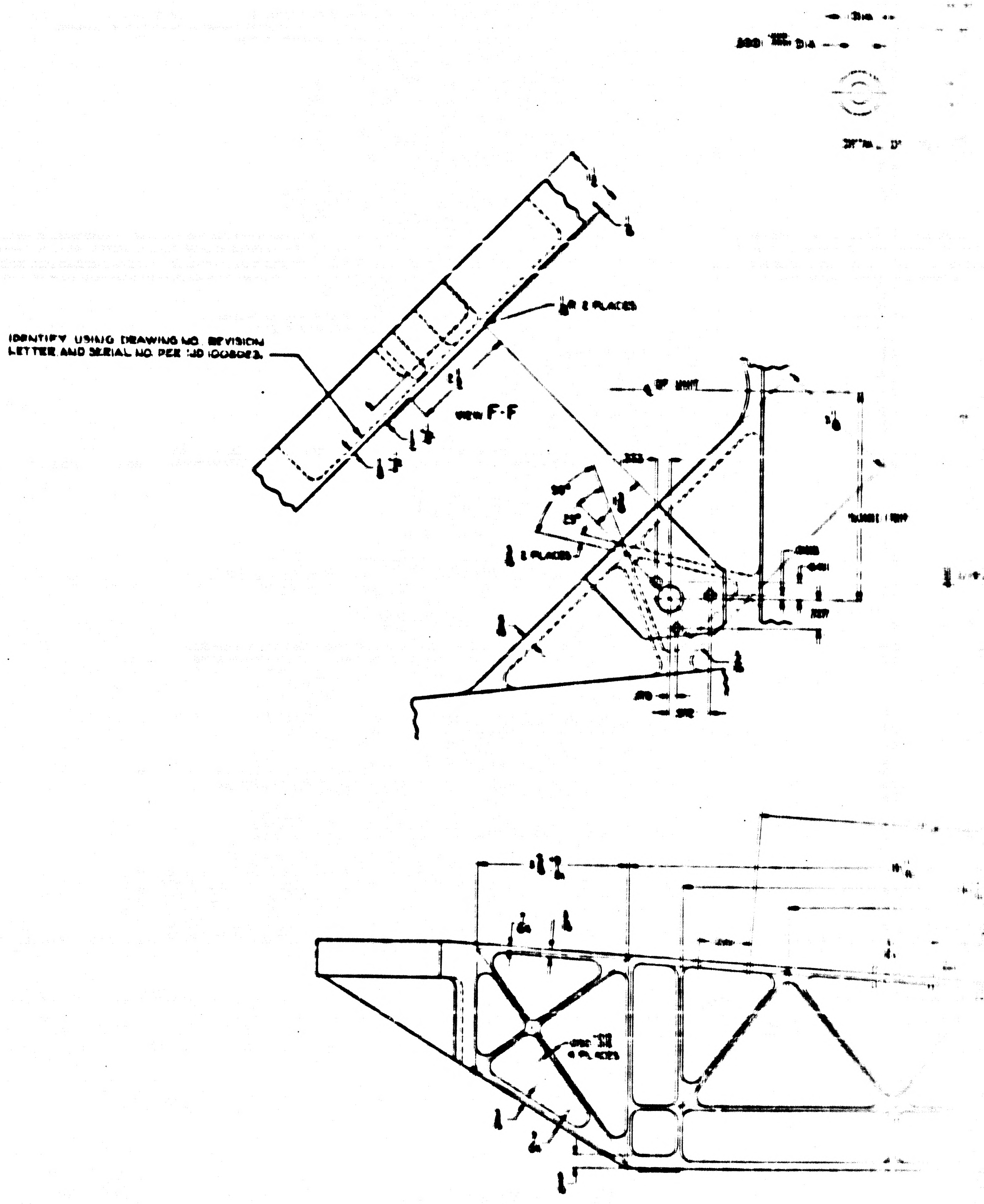
DETAIL OF ITEM ②
.5.000 REF
45° BASIC
2 PLACES
VIEW G-G
SURFACE Z
SURFACE Y
SURFACE X
UNIT IS SYMMETRICAL ABOUT ℄
DATUM PLAN-B
3 PLACES
90° C'SINK TO .606 DIA.
TAP FOR 1/4-28 UNF 3B HELICOIL
USE HELICOIL TAP
.332 DIA THRU
2 HOLES
2 PLACES
A
B
ALL AROUND
SECTION D-D
2 PLACES
VIEW B-B
169308

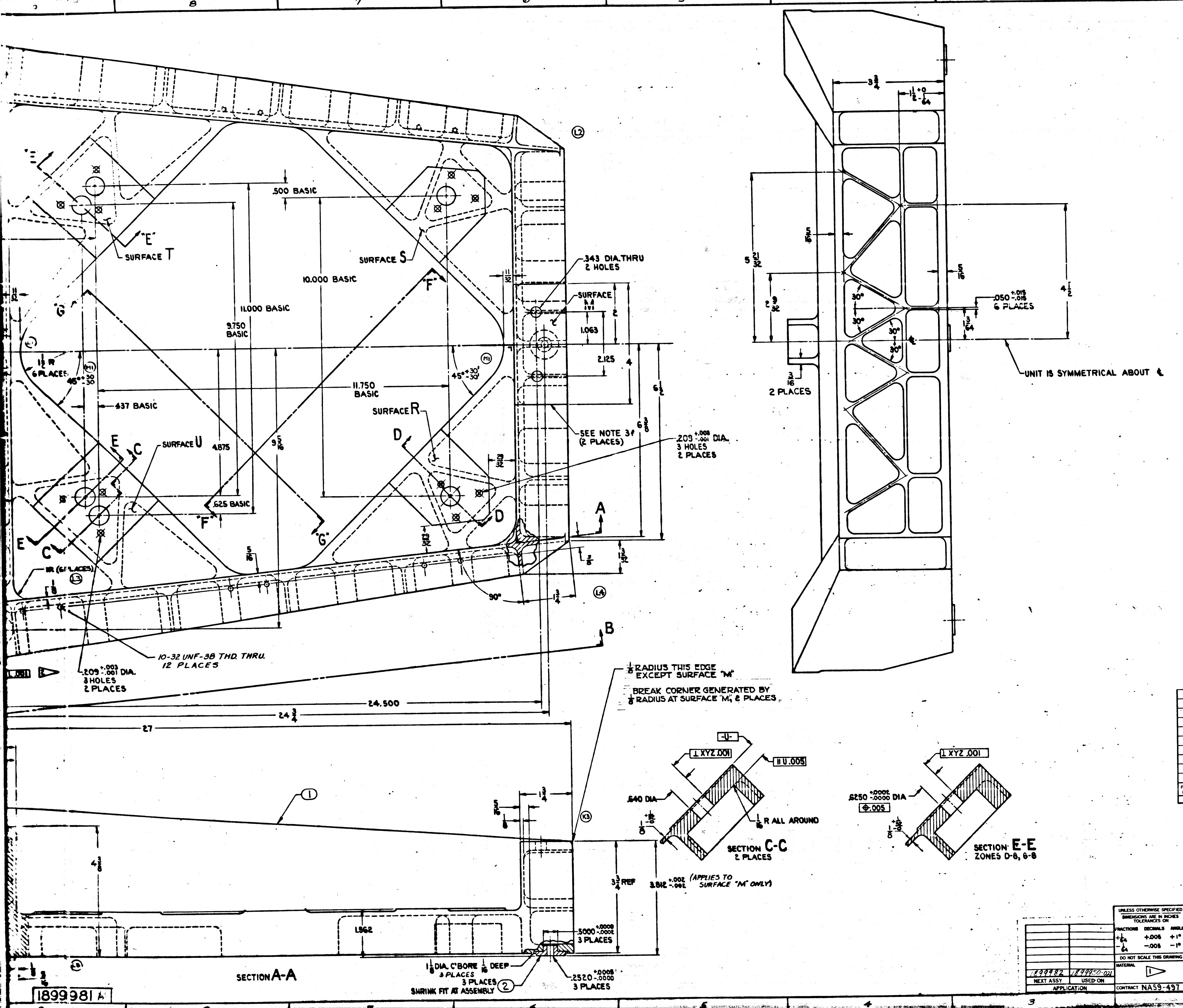
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

2. MATERIAL:
   a. NAVIGATION BASE - BERYLLIUM PER MIL-B-21631
   b. REFERENCE RODS - STAINLESS STEEL PER QQ-S-763, CLASS 321, CONDITION A

3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED 63/.
      3. ALL FILLETS ⅛ R
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68°±1°F
   b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   c. SURFACES RSTUV TO BE 16/.
   d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
   e. DATUM PLANE B IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
   f. BLEND RADIUS REQ'D IF SURFACE "W" IS ABOVE OR BELOW 3⅛ REF DIMENSION

4. APPLIES ONLY TO .2520 DIA HOLES.


IDENTIFY USING DRAWING NO. REVISION LETTER AND SERIAL NO. PER ND 1002023.
VIEW F-F
⅛R 2 PLACES
DETAIL D


"E"
SURFACE T
.500 BASIC
SURFACE S
10.000 BASIC
11.000 BASIC
9.750 BASIC
"F"
"G"
11/32
1 1/2 R 6 PLACES
45° +30′ −30′
M1
.437 BASIC
11.750 BASIC
SURFACE R
E
C
SURFACE U
4.875
9 5/16
D
.625 BASIC
"F"
"G"
D
E
C
5/16
1R (6 PLACES)
L3
1/8
29/32
29/32
.343 DIA. THRU 2 HOLES
SURFACE M
1.063
2
2.125
4
6 1/2
6 3/8
SEE NOTE 3 (2 PLACES)
.209 +.003 −.001 DIA. 3 HOLES 2 PLACES
A
1/8
1 3/32
90°
1 3/4
L2
L4
B
10-32 UNF-3B THD. THRU. 12 PLACES
.209 +.003 −.001 DIA. 3 HOLES 2 PLACES
⊥ .001 △2
24.500
24 3/4
27
1/8 RADIUS THIS EDGE EXCEPT SURFACE "M"
BREAK CORNER GENERATED BY 1/8 RADIUS AT SURFACE "M", 2 PLACES
1
1 3/4
5/16
1/8
K3
4 3/8
3 3/4 REF
3.812 +.002 −.002 (APPLIES TO SURFACE "M" ONLY)
1.562
.5000 +.0000 −.0002 3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
3 PLACES SHRINK FIT AT ASSEMBLY 2
.2520 +.0005 −.0000 3 PLACES
SECTION A-A
L3
1/8
5/16
1899981 A
3 3/4
1 1/2 +0 −1/64
5/16
5 21/32
2 9/32
30°
30°
30°
30°
5/16
.050 +.015 −.015 6 PLACES
4 1/2
1 3/64
3/16 2 PLACES
UNIT IS SYMMETRICAL ABOUT ℄
-U-
⊥ XYZ .001
∥ U .005
.640 DIA
1/8 +1/32 −0
1/16 R ALL AROUND
SECTION C-C 2 PLACES
⊥ XYZ .001
.6250 +.0002 −.0000 DIA
⌖ .005
1/8 +1/32 −0
SECTION E-E ZONES D-8, G-8

REVISIONS TDRR [illegible]

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APP'D
A		UPGRADED FOR CLASS A RELEASE TDRR 01543		6-14 63	F.L. WK
B		REVISED IN ACCORDANCE WITH TDRR 02266		31 July 63	RWG
C		REVISED IN ACCORDANCE WITH TDRR 02311		31 July 63	RWG WK
D		REVISED IN ACCORDANCE WITH TDRR 02402		AUG 63	R.W.G. WK
E		REVISED PER TDRR NO. 03191		9/26 63	[illegible]
F3		REVISED PER TDRR NO. 03310		10/63	WC
G2		REVISED PER TDRR NO. 03678		2 OCT 63	[illegible]
H		REVISED PER TDRR NO. 04066		30 OCT 63	WK
J		REVISION NOT USED			
K5		REVISED PER TDRR NO. 04527		14 NOV 63	WJ
L9		REVISED PER TDRR NO. 04526		14 NOV 63	WK
M3		REVISED PER TDRR NO. 0462		2 NOV 63	WK

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	3	1899981-2	PAD REFERENCE
1	1	1899981-1	BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899982	1899950-021

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+1°
−1/64	−.005	−1°

DO NOT SCALE THIS DRAWING
MATERIAL △1
CONTRACT NAS9-497

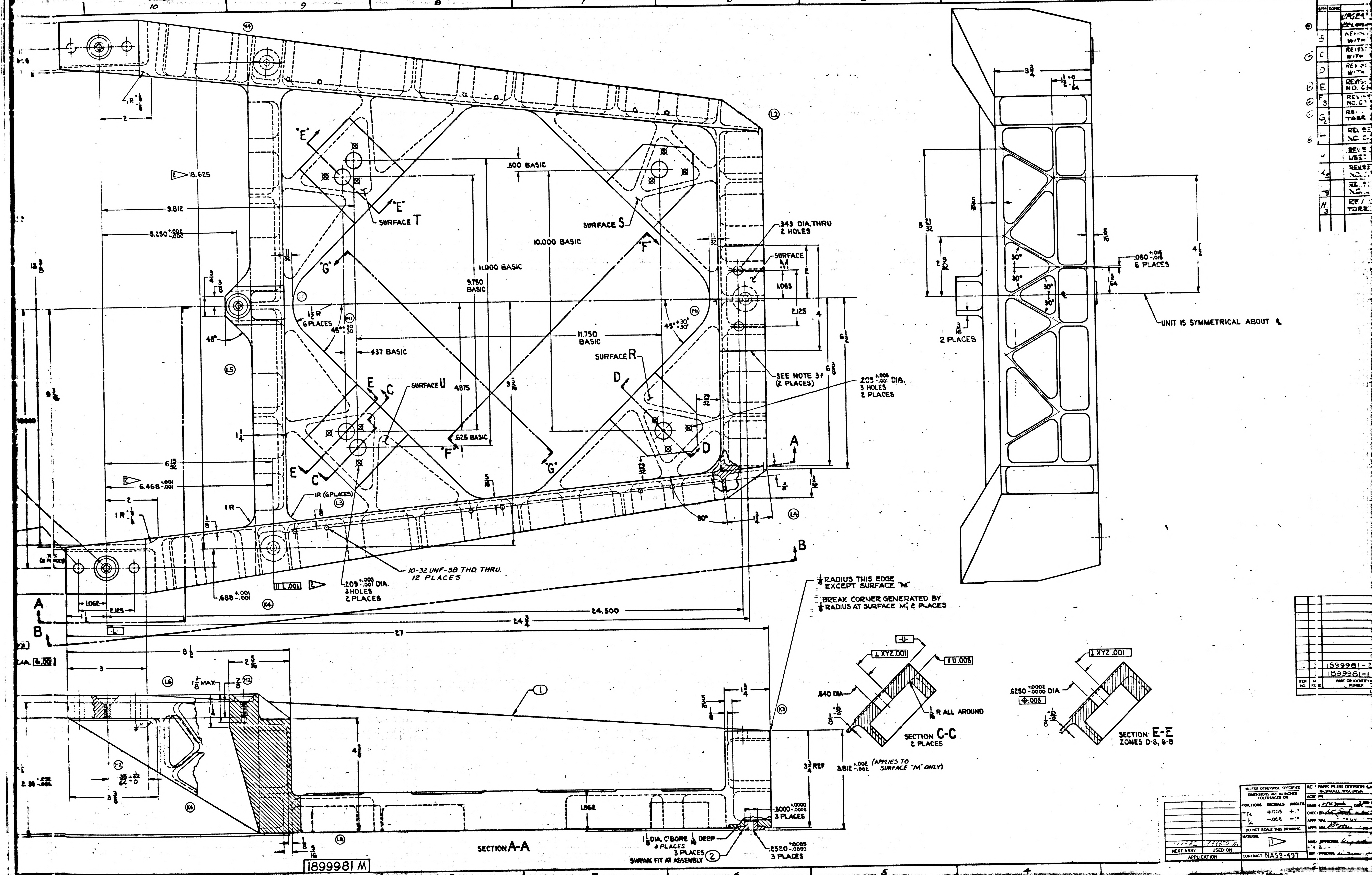
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 7 JUN 63
CHECKED [illegible] 11 JUN 63
APPROVAL [illegible] HANN 11 JUN 63
APPROVAL [illegible] 11 JUN 63
NASA APPROVAL 6-16-63
MIT APPROVAL [illegible] 14 JUN 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STRUCTURAL ASSY,
NAVIGATION BASE

CODE IDENT NO.
SIZE J3
1899981
SCALE 1:1
SHEET

F-4



SURFACE T
SURFACE S
SURFACE R
SURFACE U
SURFACE M
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
11.750 BASIC
.437 BASIC
.625 BASIC
4.875
18.625
9.812
5.250 +.002 -.000
6.468 +.001 -.001
.688 +.001 -.001
24.500
24 3/4
27
.343 DIA. THRU 2 HOLES
.209 +.003 -.001 DIA. 3 HOLES 2 PLACES
SEE NOTE 3 (2 PLACES)
10-32 UNF-3B THD. THRU. 12 PLACES
1 1/2 R 6 PLACES
1R (6 PLACES)
45°
45° +30' -30'
90°
UNIT IS SYMMETRICAL ABOUT ℄
.050 +.015 -.015 6 PLACES
30°
3/16 2 PLACES
1/8 RADIUS THIS EDGE EXCEPT SURFACE "M"
BREAK CORNER GENERATED BY 1/8 RADIUS AT SURFACE "M", 2 PLACES
⊥ XYZ .001
∥ U .005
.640 DIA.
1/16 R ALL AROUND
SECTION C-C 2 PLACES
.6250 +.0002 -.0000 DIA.
⊕ .005
SECTION E-E ZONES D-8, G-8
3.812 +.002 -.002 (APPLIES TO SURFACE "M" ONLY)
3 3/4 REF
.5000 +.0000 -.0002 3 PLACES
1 1/8 DIA. C'BORE 1/16 DEEP 3 PLACES
3 PLACES
SHRINK FIT AT ASSEMBLY ②
.2520 +.0005 -.0000 3 PLACES
1.562
SECTION A-A
1 1/8 MAX
①
A
B
C
D
E
F
G
1899981-2
1899981-1
ITEM NO
PART OR IDENTIFYING NUMBER
INCHES
PHOTOGRAPHIC SCALE ONLY

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+1°
- 1/64	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL ▷1

NEXT ASSY	USED ON
1899972	1999950-02

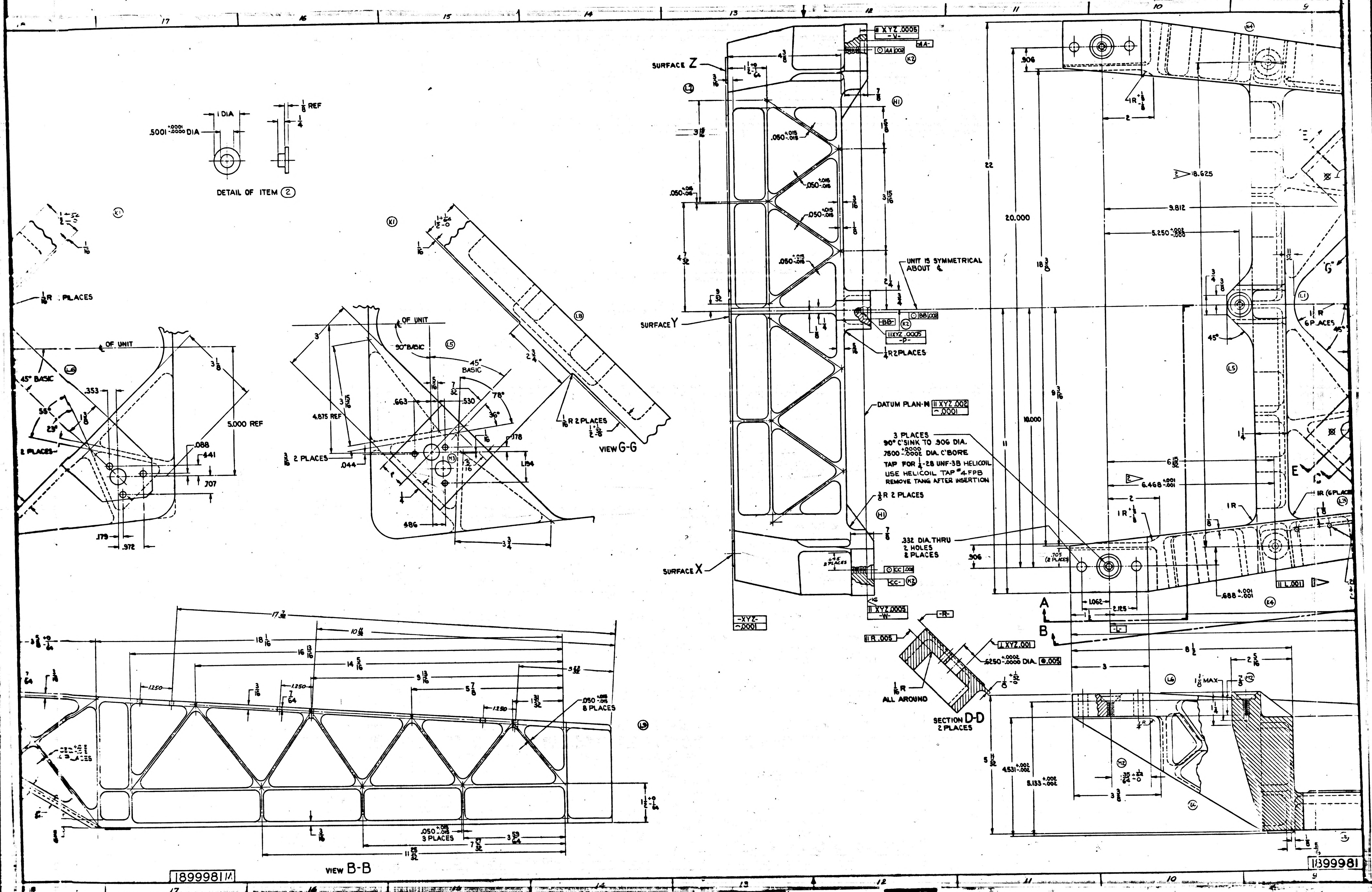
APPLICATION

CONTRACT NAS9-497

AC SPARK PLUG DIVISION
MILWAUKEE, WISCONSIN

1899981 M

F3



DETAIL OF ITEM ②
.5001 +.0001 -.0000 DIA
1 DIA
1/8 REF
1/4
SURFACE Z
SURFACE Y
SURFACE X
UNIT IS SYMMETRICAL ABOUT ℄
DATUM PLAN-N
3 PLACES 90° C'SINK TO .906 DIA. .7500 +.0000 -.0002 DIA. C'BORE TAP FOR 1/4-28 UNF-3B HELICOIL USE HELICOIL TAP #4-FPB REMOVE TANG AFTER INSERTION
.332 DIA. THRU 2 HOLES 2 PLACES
1/4 R 2 PLACES
3/8 R 2 PLACES
.050 +.015 -.015
-XYZ-
-V-
-AA-
-BB-
-P-
-W-
-CC-
-R-
-L-
℄ OF UNIT
45° BASIC
90° BASIC
5.000 REF
4.875 REF
2 PLACES
1/16 R 2 PLACES
VIEW G-G
1/16 R ALL AROUND
SECTION D-D 2 PLACES
.6250 +.0002 -.0000 DIA.
1 1/8 MAX
VIEW B-B
.050 +.015 -.015 8 PLACES
.050 +.015 -.015 3 PLACES
22
20.000
18.625
9.812
5.250 +.002 -.000
6.468 +.001 -.001
10.000
.906
.688 +.001 -.001
1.062
2.125
8 1/2
4.531 +.002 -.002
5.133 +.002 -.002
A
B
E
G
1899981M

1899981M

1899981

PHOTOGRAPHIC SCALE ONLY

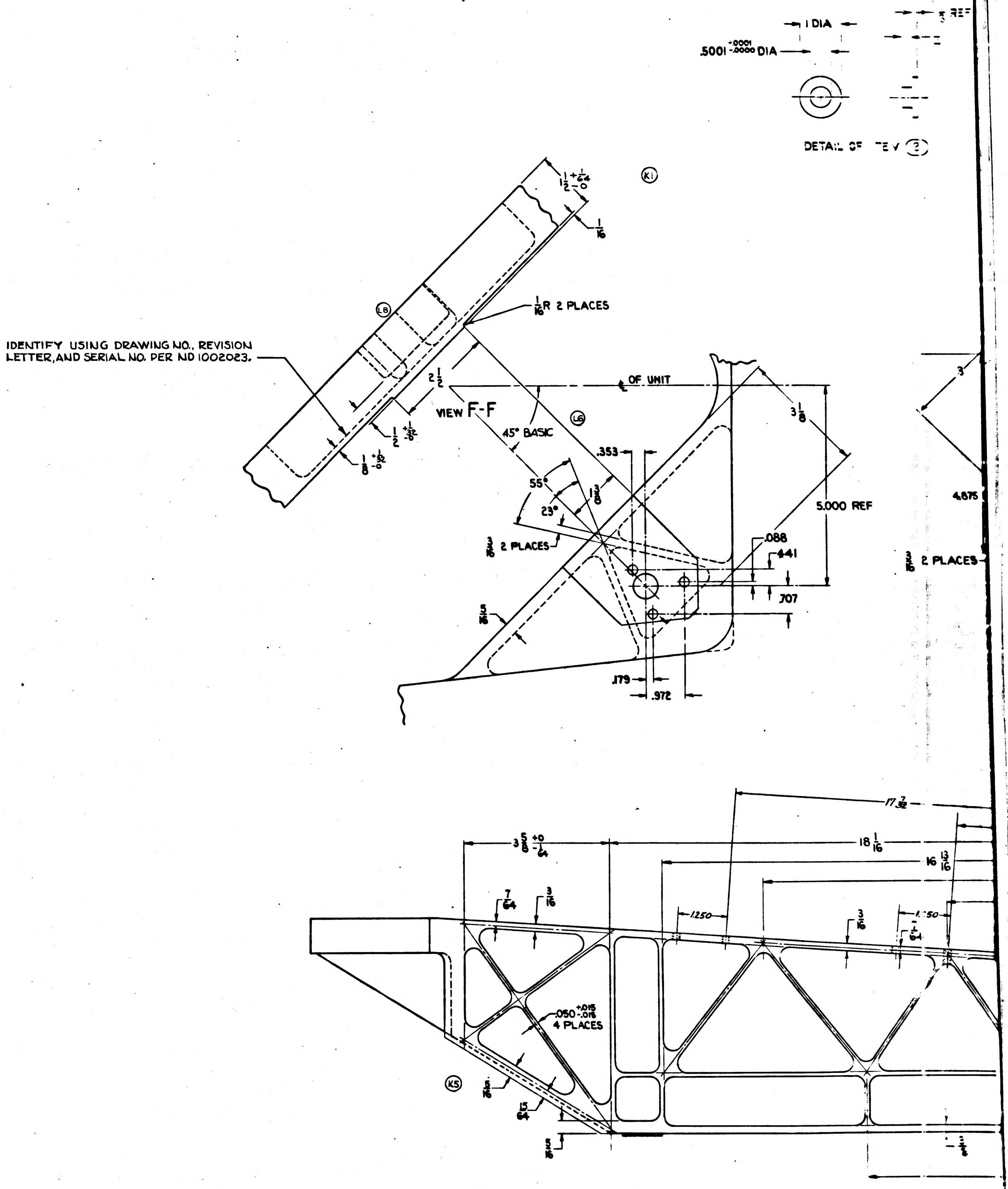
F-2

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

▷1 2. MATERIAL:
   a. NAVIGATION BASE-BERYLLIUM PER MIL-B-21531
   b. REFERENCE PADS-STAINLESS STEEL PER QQ-S-766, CLASS 321, CONDITION A

3. REQUIREMENTS:
   a. UNLESS OTHERWISE SPECIFIED:
      1. REMOVE BURRS, BREAK SHARP EDGES & INTERSECTIONS OF BLEND RADII .005 TO .015 RADIUS OR CHAMFER.
      2. SURFACE ROUGHNESS SHALL NOT EXCEED $\overset{63}{\checkmark}$.
      3. ALL FILLETS 1/4 R.
      4. ALL WEB THICKNESS TO BE .100
      5. ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.
   b. SURFACE RSTU MUST BE PARALLEL WITH SURFACE XYZ WITHIN .005.
   c. SURFACES RST & U TO BE $\overset{32}{\checkmark}$.
   d. PRIOR TO ANY FINISH MACHINING STABILIZE PER ND 1002022.
   e. DATUM PLANE N IS DEFINED BY THE HIGH POINTS OF SURFACES PVW.
   f. BLEND RADIUS REQ'D IF SURFACE "M" IS ABOVE OR BELOW $3\frac{3}{4}$ REF DIMENSION

▷2 h. APPLIES ONLY TO .2520 DIA. HOLES.



1 DIA
.5001 $^{+.0001}_{-.0000}$ DIA
DETAIL OF VIEW
K1
$1\frac{1}{2}$ $^{+\frac{1}{64}}_{-0}$
$\frac{1}{16}$
L8
$\frac{1}{16}$R 2 PLACES
IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND 1002023.
$2\frac{1}{2}$
℄ OF UNIT
VIEW F-F
45° BASIC
L6
$3\frac{1}{8}$
$\frac{1}{2}$ $^{+\frac{1}{32}}_{-0}$
$\frac{1}{8}$ $^{+\frac{1}{32}}_{-0}$
.353
55°
23°
$1\frac{3}{8}$
5.000 REF
$\frac{3}{16}$ 2 PLACES
.088
.441
.707
$\frac{5}{16}$
.179
.972
3
4.875
$\frac{3}{16}$ 2 PLACES
$17\frac{7}{32}$
$3\frac{5}{8}$ $^{+0}_{-\frac{1}{64}}$
$18\frac{1}{16}$
$16\frac{13}{16}$
$\frac{7}{64}$
$\frac{3}{16}$
1.250
$\frac{3}{16}$
1.250
$\frac{1}{64}$
.050 $^{+.015}_{-.015}$ 4 PLACES
K5
$\frac{5}{16}$
$\frac{15}{64}$
$\frac{5}{16}$

1899981 V

1899982

01593

REVISIONS TDRR 01593					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		UPGRADED FOR CL."A" RELEASE TDRR 01593		14 JUN 63	WET wll

PICTURE INCOMPLETE

REQD	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4		MS171524-101	PIN-SPRING
4		MS21209-FS-15	INSERT-SELF LOCK
4		MS35690-430	NUT-PLAIN, HEX
2		AN960C416	WASHER-PLAIN
2		1899968	PIN-ALIGNMENT
12		1010284-312	SCREW-FLAT HD, 100°HEX SOC
3		1899965	INSERT-OPTICS MOUNTING
1		1899964	↑ ↑ RH REAR
1		1899963	LH REAR
1		1899962	RH FRONT
1		1899961	PLATE-BACK UP, LH FRONT
1		1899960	↑ ↑ RH REAR
1		1899959	LH REAR
1		1899958	RH FRONT
1		1899957	PAD-IMU MOUNTING, LH FRONT
1		1899981	STRUCTURAL ASSY.-NAV. BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-021	1899950-021

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiele DATE 14 JUN 63
CHECKED Mac Kaustai 14 JUN 63
APPROVAL J. HANN 14 JUN '63
APPROVAL A. Kobel 14 JUN 63
NASA APPROVAL W.J. Rhine 6-19-63
R.W. Bass 6/19/63
MIT APPROVAL W. Cuff 19 Jun 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO.
SIZE C
1899982
SCALE −
SHEET −

MIL 1077C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899982

01593

REVISIONS TDRR 01593

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		UPGRADED FOR CL."A" RELEASE TDRR 01593		14 JUN 63	WEV WR.
B		Replaced by Rev C with changes. — added picture per TDRR 02405		7 [illegible] 63	WE.

PICTURE INCOMPLETE

REQD	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4		MS171524-101	PIN-SPRING
4		MS21209-FS-15	INSERT-SELF LOCK
4		MS35690-430	NUT-PLAIN, HEX
2		AN960C416	WASHER-PLAIN
2		1899968	PIN-ALIGNMENT
12		1010284-312	SCREW-FLAT HD, 100° HEX SOC
3		1899965	INSERT-OPTICS MOUNTING
1		1899964	↑ ↑ RH REAR
1		1899963	LH REAR
1		1899962	RH FRONT
1		1899961	PLATE-BACK UP, LH FRONT
1		1899960	↑ ↑ RH REAR
1		1899959	LH REAR
1		1899958	RH FRONT
1		1899957	PAD-IMU MOUNTING, LH FRONT
1		1899981	STRUCTURAL ASSY.-NAV. BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-021	1899950-021

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiele DATE 14 JUN 63
CHECKED [illegible] 14 JUN 63
APPROVAL J. HANN 14 JUN '63
APPROVAL A Kodel 14 JUN 63
NASA APPROVAL 6-19-63
R.W. Bass 6/19/63
MIT APPROVAL 19 Jun 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

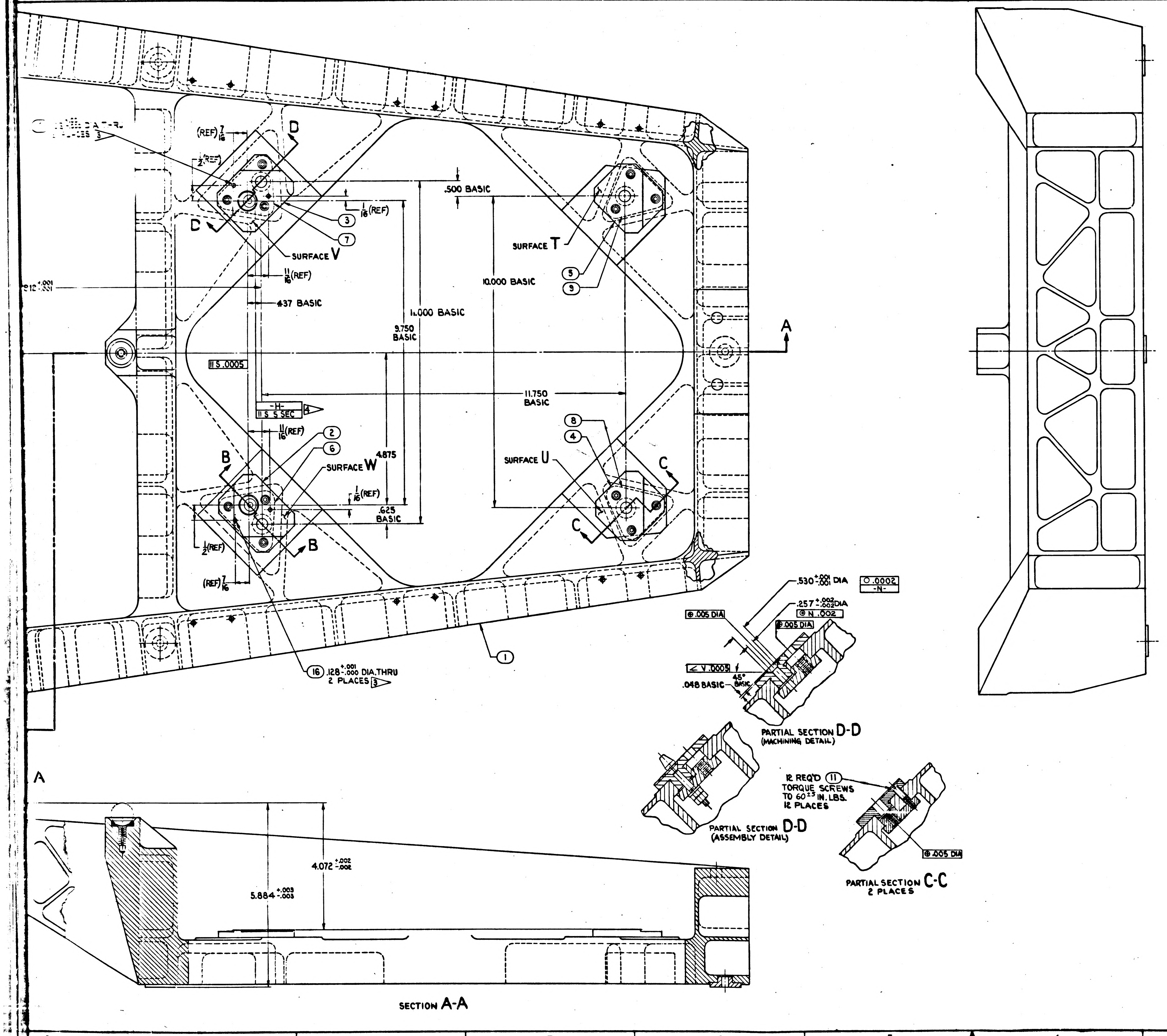
FRAME ASSEMBLY-
NAVIGATION BASE
(FINAL MACHINING)

CODE IDENT NO.
SIZE C
1899982
SCALE −
SHEET −

MIL 1017C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO
C		REPLACES WORD DWG PER TDRR 02405	



(REF) 7/16
1/2 (REF)
D
D
3
7
SURFACE V
1/16 (REF)
11/16 (REF)
.812 +.001 -.001
.437 BASIC
.500 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
SURFACE T
5
9
A
11.750 BASIC
⊥ S .0005
-H-
⊥ S .5 SEC 4
8
4
2
6
11/16 (REF)
B
SURFACE W
4.875
SURFACE U
C
1/16 (REF)
.625 BASIC
1/2 (REF)
B
C
(REF) 7/16
1
16 .128 +.001 -.000 DIA THRU 2 PLACES 3
.530 +.001 -.001 DIA
○ .0002 -N-
.257 +.002 -.002 DIA
⊕ .005 DIA
◎ N .002
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D 11 TORQUE SCREWS TO 60 ±5 IN. LBS. 12 PLACES
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
A
4.072 +.002 -.002
5.884 +.003 -.003
SECTION A-A

REPLACES REV "B" WITH CHANGE

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	3	MS-21209-F4-15	INSERT-SELF LOCKING
16	4	MS-171528	PIN SPRING
15	4	MS-21209-FS-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX
10	3	1899965	INSERT-OPTICS MOUNTIN
9		1899964	PLATE-BACK-UP, R H RE
8		1899963	L H RE
7		1899962	R H FR
6		1899961	L H FR
5		1899960	PAD-MOUNTING R
4		1899959	
3		1899958	R
2		1899957	
		1899981	STRUCTURAL ASSY-NAV.

LIST OF PARTS AND MATERIALS

1899950-021	1899950-021
NEXT ASSY	USED ON

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+2°
- 1/64	-.005	-2°

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN Eynde DATE 6-17-63
CHECKED J Kem 7-22-63
APPROVAL J. HANN 7-22-63
APPROVAL 8/7/63
NASA APPROVAL
MIT APPROVAL 7-6-63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY
NAVIGATION BASE

CODE IDENT NO
SIZE J
18999

SCALE

E2

1899982

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16√

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

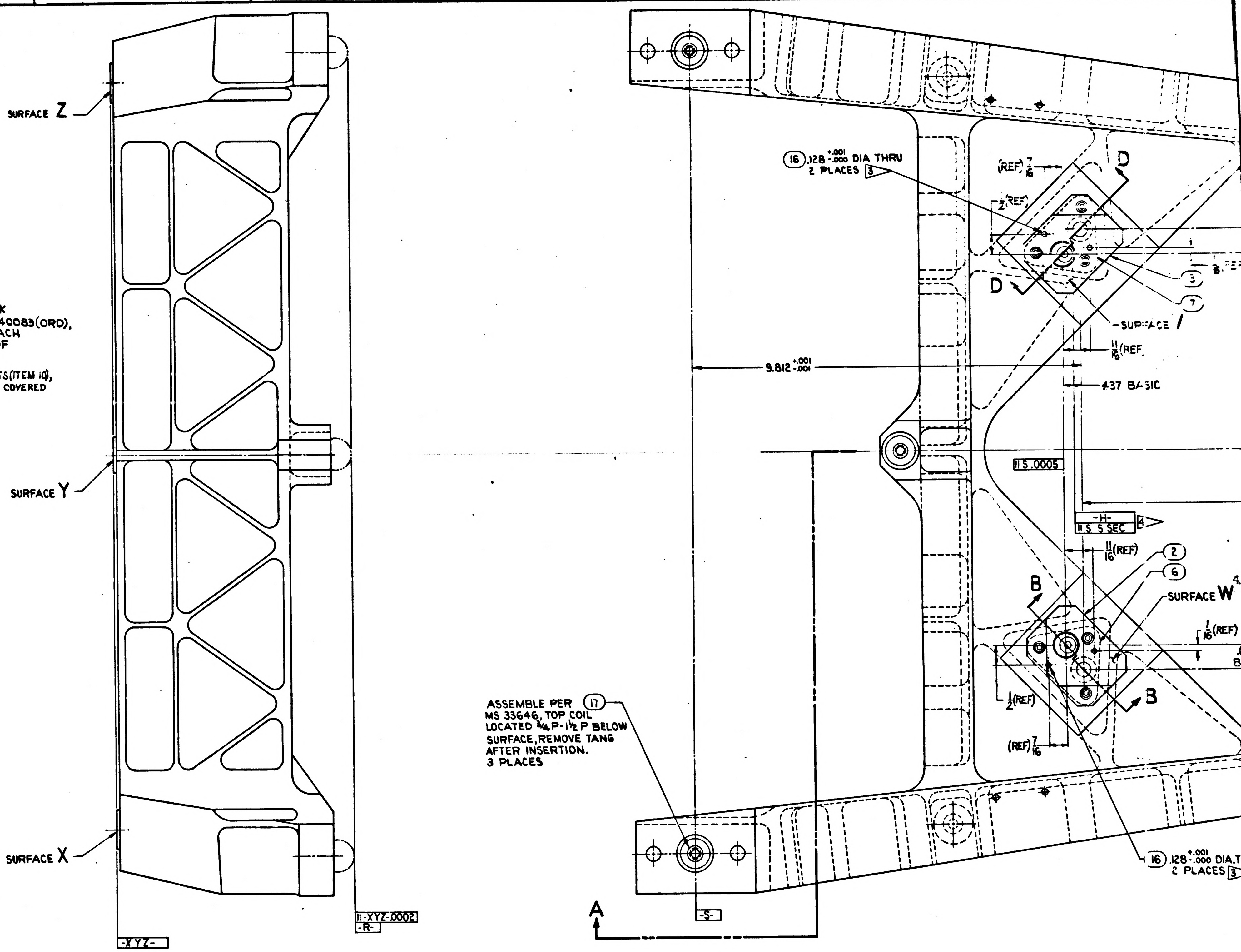
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.

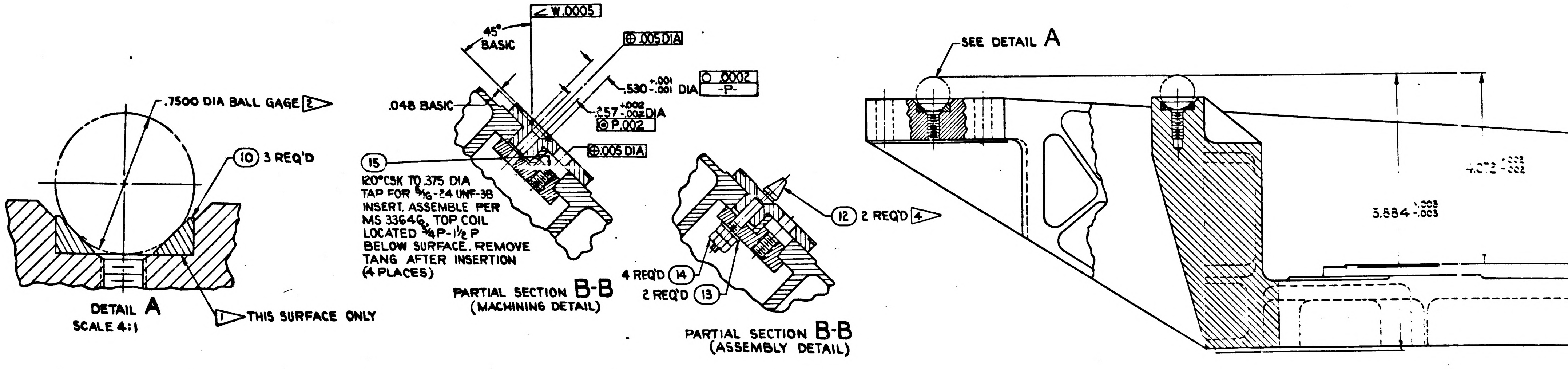
2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

3▷ INSERT PINS 1/16 BELOW SURFACES "V" & "W" PRIOR TO FINISH MACHINING OF THESE SURFACES.

4▷ AFTER ADJUSTMENT OF DATUM -H- TO -S- TORQUE 1 EACH OF ITEM 14 (2 PLACES TO $85^{\pm 5}$ IN.LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-. APPLY COMPOUND, MIL-S-40083(ORD), CLASS 30, TO THREADS OF ITEM 12 (2 PLACES). TORQUE 1 EACH ITEM 14 (2 PLACES) TO $60^{\pm 5}$ IN-LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-

SURFACES T,U,V, & W, THE ALIGNMENT PINS, THE OPTICS MOUNTING INSERTS (ITEM 10), AND THE REFERENCE PADS (SURFACES X, Y, & Z) SHALL BE PROTECTIVELY COVERED AT ALL TIMES AFTER COMPLETION OF MACHINING & INSPECTION.


SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
II -XYZ- .0002
-R-
⑯ .128 +.001 -.000 DIA THRU 2 PLACES 3
(REF) 7/16
D
D
③
⑦
SURFACE
11/16 (REF.
.437 BASIC
9.812 +.001 -.001
II S .0005
-H-
II S .S SEC 4
11/16 (REF)
②
⑥
B
B
SURFACE W
1/16 (REF)
1/2 (REF)
(REF) 7/16
ASSEMBLE PER ⑰ MS 33646, TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE, REMOVE TANG AFTER INSERTION. 3 PLACES
⑯ .128 +.001 -.000 DIA. 2 PLACES 3
A
-S-


.7500 DIA BALL GAGE 2
⑩ 3 REQ'D
1 THIS SURFACE ONLY
45° BASIC
∠ W .0005
⊕ .005 DIA
.048 BASIC
.530 +.001 -.001 DIA
○ .0002 -P-
.257 +.002 -.002 DIA
◎ P .002
⊕ .005 DIA
⑮
120° CSK TO .375 DIA TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS 33646, TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION (4 PLACES)
⑫ 2 REQ'D 4
4 REQ'D ⑭
2 REQ'D ⑬
SEE DETAIL A
4.072 +.002 -.002
3.884 +.003 -.003

DETAIL A
SCALE 4:1

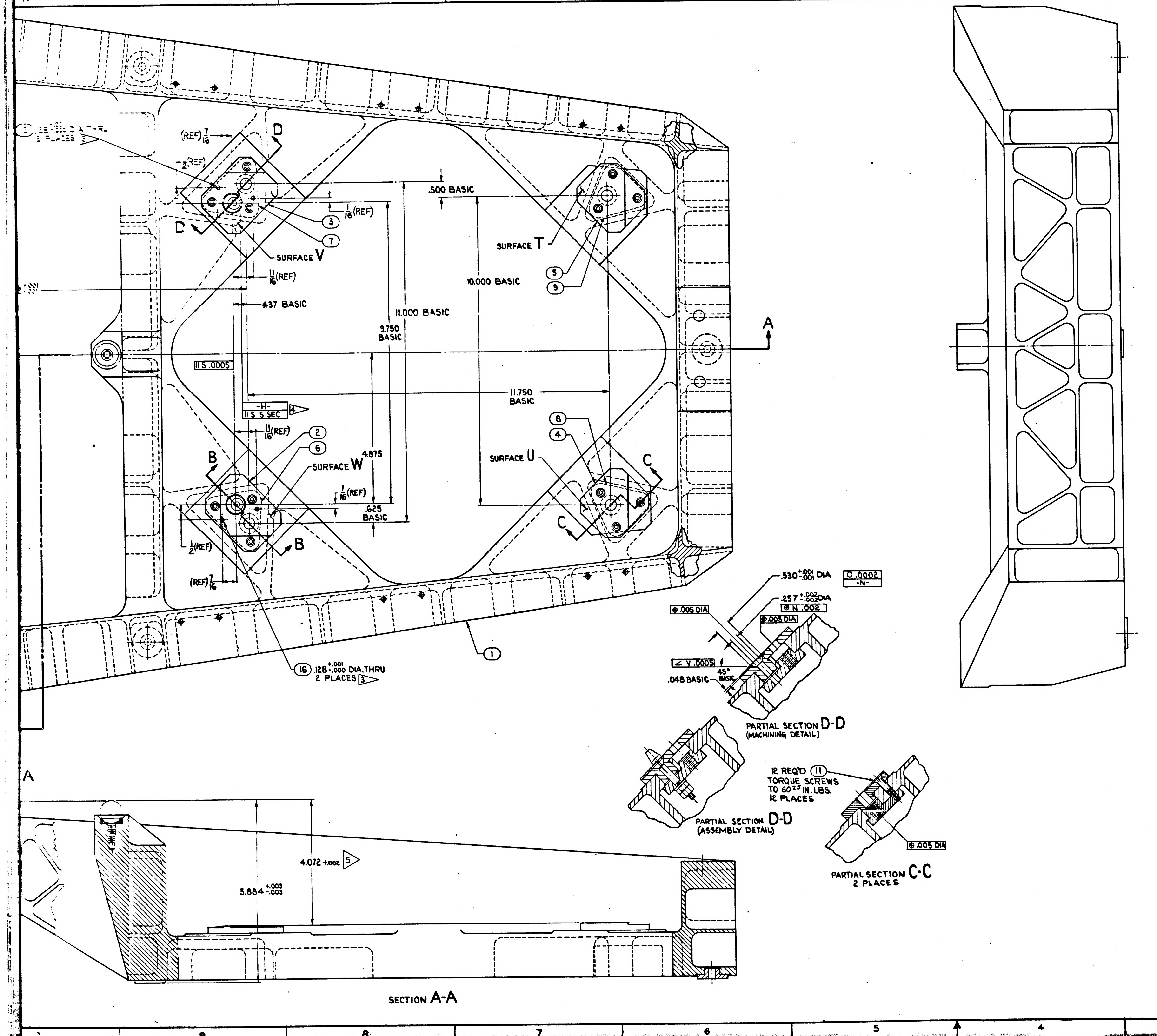
PARTIAL SECTION B-B
(MACHINING DETAIL)

PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

E-1

1899982

SYM	ZONE	DESCRIPTION	CHG NO	DAT
C		REPLACES WORDING PER TDRR 0245		
D2		REVISED PER TDRR NO 03102		



(REF) 7/16
1/2 (REF)
D
D
C
C
B
B
A
A
3
7
1/16 (REF)
SURFACE V
.500 BASIC
SURFACE T
5
9
10.000 BASIC
11.000 BASIC
9.750 BASIC
11/16 (REF)
.437 BASIC
11 S .0005
-H-
11 S S SEC
4
11.750 BASIC
8
4
SURFACE U
2
6
SURFACE W
4.875
1/16 (REF)
.625 BASIC
1/2 (REF)
(REF) 7/16
1
16 .128 +.001 -.000 DIA. THRU 2 PLACES 3
.530 +.001 -.001 DIA
0 .0002 -N-
.257 +.002 -.002 DIA
⊕ N .002
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D 11 TORQUE SCREWS TO 60 ±5 IN. LBS. 12 PLACES
⊕ .005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 +.002 5
5.884 +.003 -.003
SECTION A-A

REPLACES REV "B" WITH CHANG

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	3	MS-21209-F4-15	INSERT-SELF LOCKING
16	4	MS-171528	PIN SPRING
15	4	MS-21209-FS-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN HEX
13	2	AN960C416	WASHER-PLAIN
2	2	899968	PIN-ALIGNMENT
[illegible]	2	010284	SCREW-FLAT HD, 100° HE
0	3	899965	INSERT-OPTICS MOUNT
9		899964	PLATE-BACK-UP
8		899963	
7		899962	
6		899961	
5		899960	PAD-MOUNTING
4		899959	
3		899958	
2		899957	
		899981	STRUCTURAL AS

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-021	1899950-02

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+2°
- 1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9 - 497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Eyman DATE 6-17-63
CHECKED 7-22-63
APPROVAL HANN 7-22-63
APPROVAL 8/7/63
NASA APPROVAL
MIT APPROVAL 7/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CODE IDENT NO
SIZE J
1899
SCALE

E-2

1899982

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16/

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1 INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

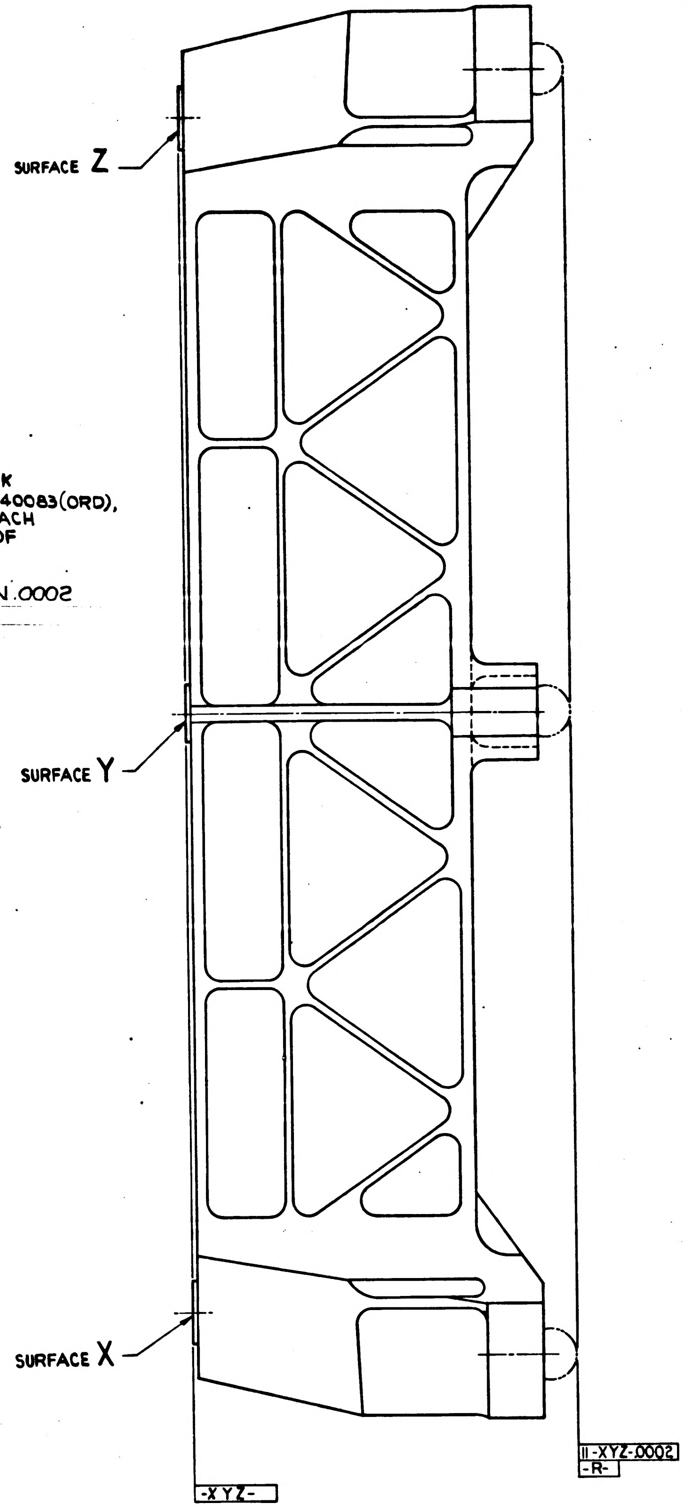
ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.

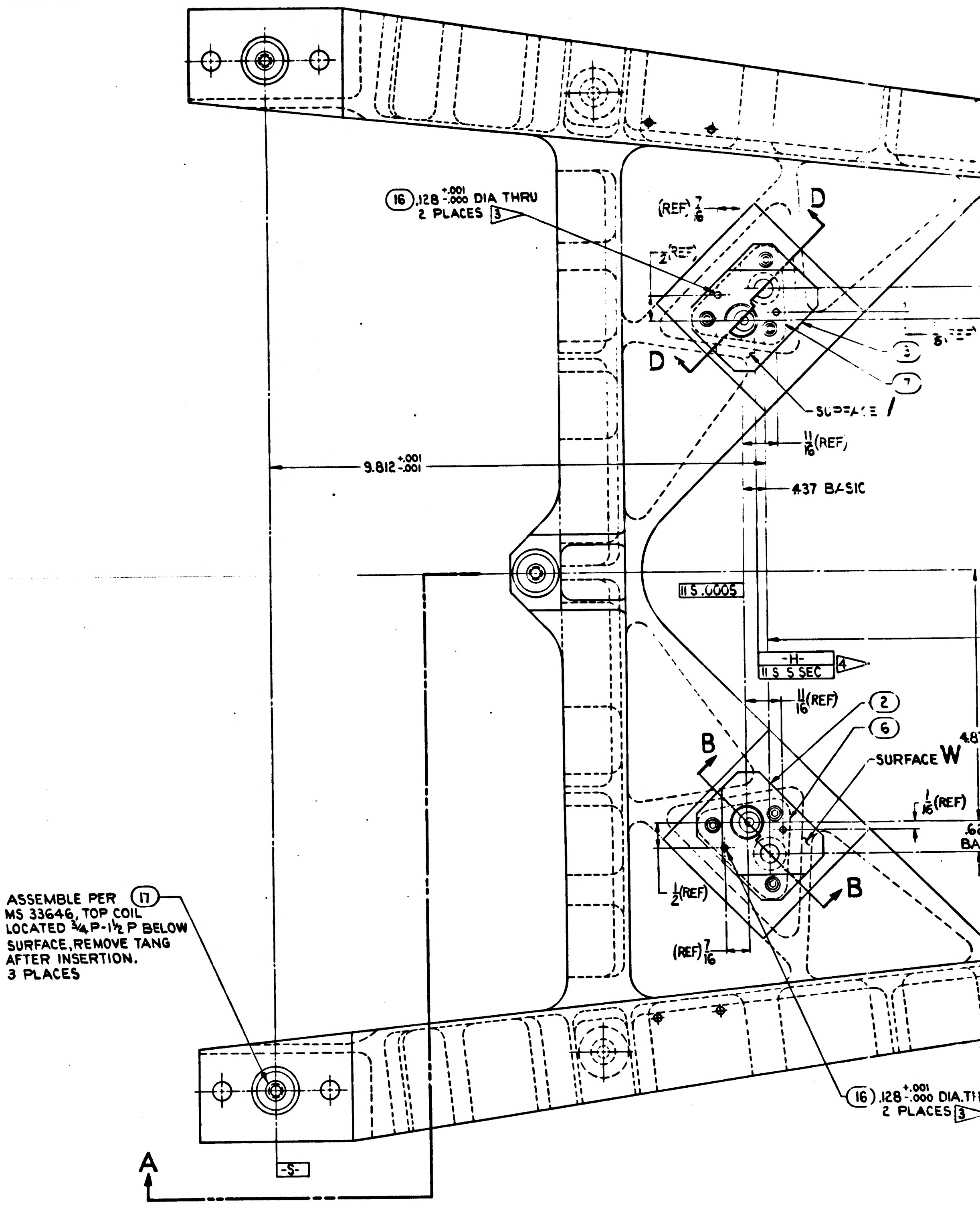
2 THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

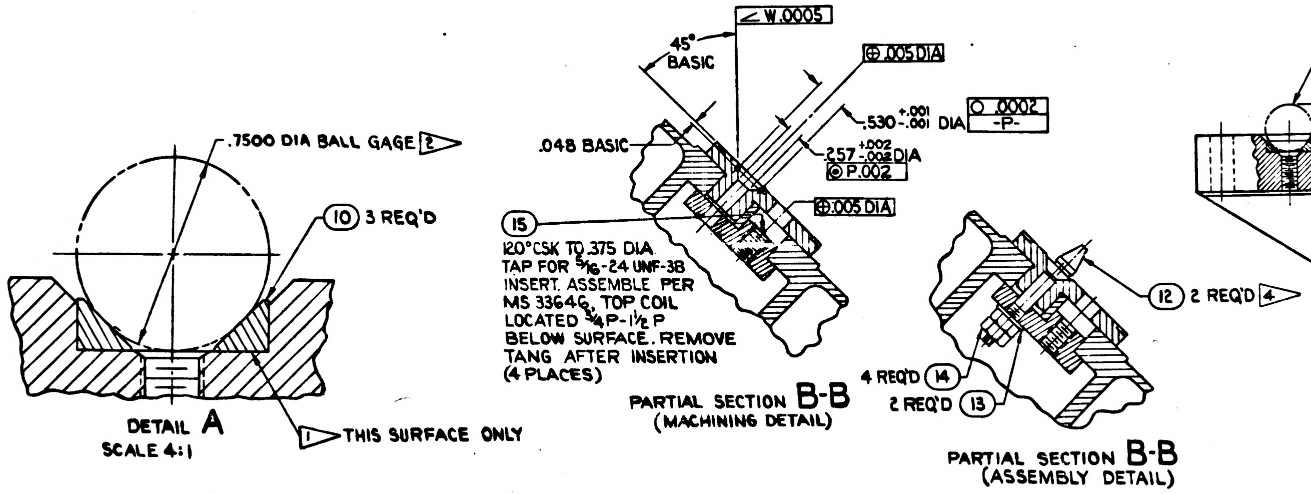
3 INSERT PINS 1/16 BELOW SURFACES "V" & "W" PRIOR TO FINISH MACHINING OF THESE SURFACES.

4 AFTER ADJUSTMENT OF DATUM -H- TO -S- TORQUE 1 EACH OF ITEM 14 (2 PLACES TO 85±5 IN.LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-. APPLY COMPOUND, MIL-S-40083(ORD), CLASS 30, TO THREADS OF ITEM 12 (2 PLACES). TORQUE 1 EACH ITEM 14 (2 PLACES) TO 60±5 IN-LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-

5 THE ESTABLISHED DIMENSION SHALL NOT VARY MORE THAN .0002 FROM SURFACE R TO ANY POINT ON SUFACES T,U,V & W


SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
II-XYZ-.0002
-R-

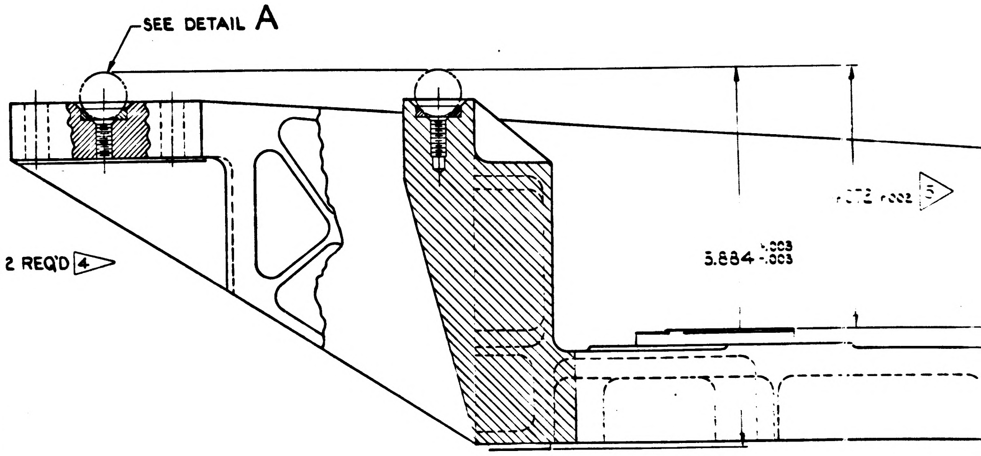

16 .128 +.001 -.000 DIA THRU
2 PLACES 3
(REF) 7/16
D
D
3
7
SURFACE T
11/16 (REF)
9.812 +.001 -.001
.437 BASIC
II S .0005
-H-
II S .5 SEC 4
11/16 (REF)
2
6
B
B
SURFACE W
1/16 (REF)
1/2 (REF)
(REF) 7/16
ASSEMBLE PER 17 MS 33646, TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE, REMOVE TANG AFTER INSERTION. 3 PLACES
16 .128 +.001 -.000 DIA.THRU
2 PLACES 3
A
-S-


.7500 DIA BALL GAGE 2
10 3 REQ'D
1 THIS SURFACE ONLY
W .0005
45° BASIC
.005 DIA
.048 BASIC
.530 +.001 -.001 DIA
O .0002
-P-
.257 +.002 -.002 DIA
P .002
.005 DIA
15
120° CSK TO .375 DIA TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS 33646. TOP COIL LOCATED 3/4P-1 1/2P BELOW SURFACE. REMOVE TANG AFTER INSERTION (4 PLACES)
12 2 REQ'D 4
4 REQ'D 14
2 REQ'D 13

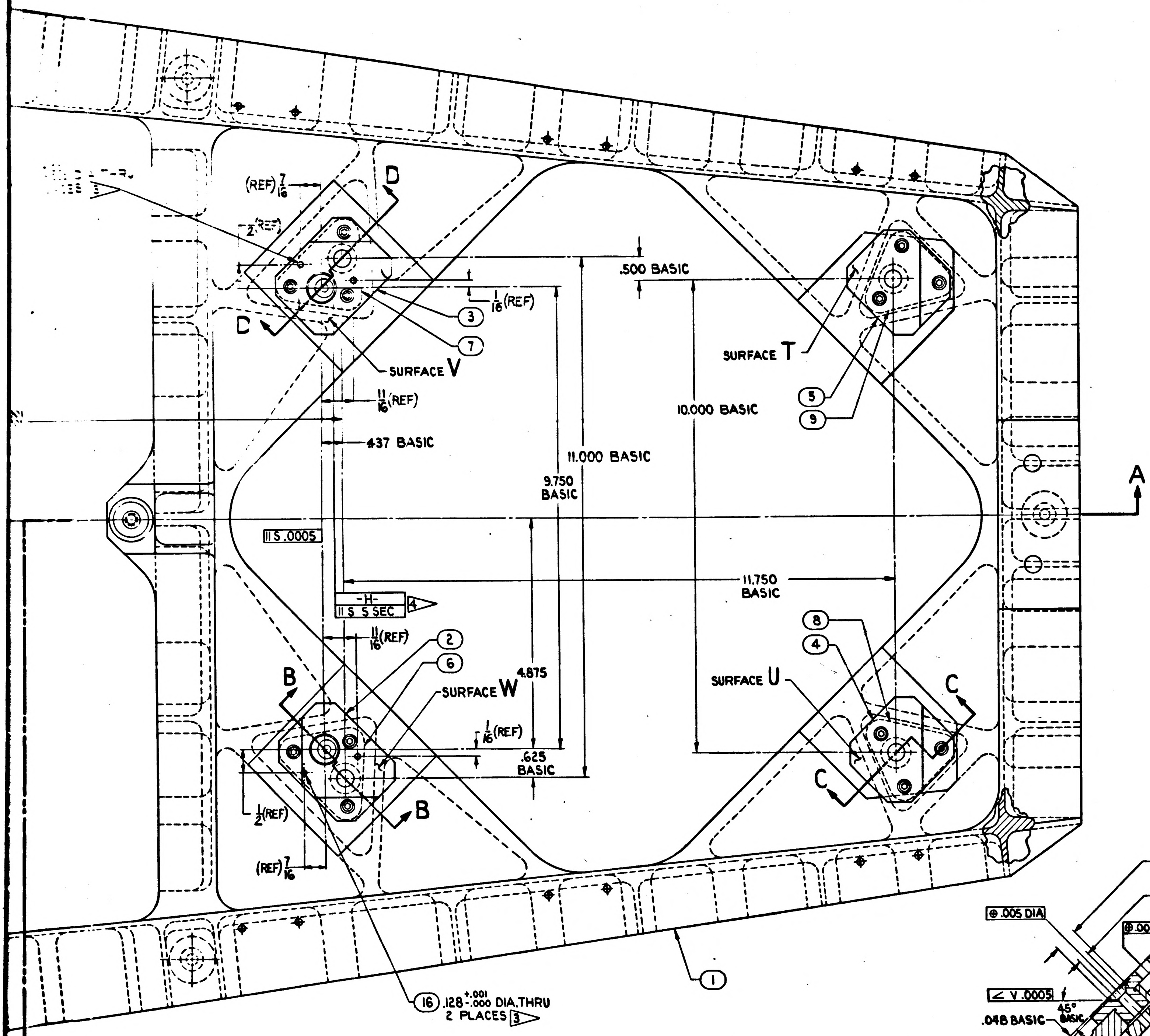
DETAIL A
SCALE 4:1

PARTIAL SECTION B-B
(MACHINING DETAIL)

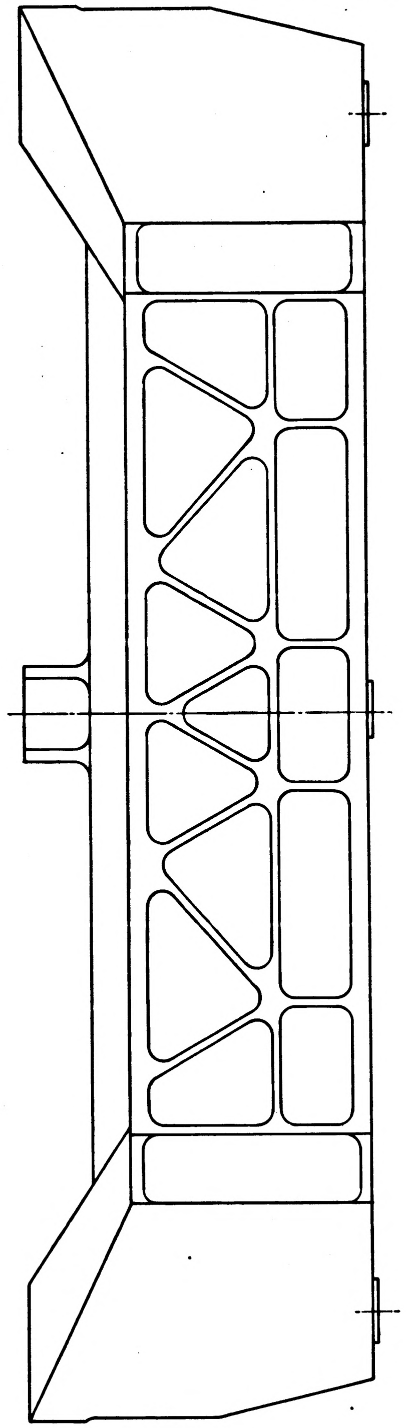
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

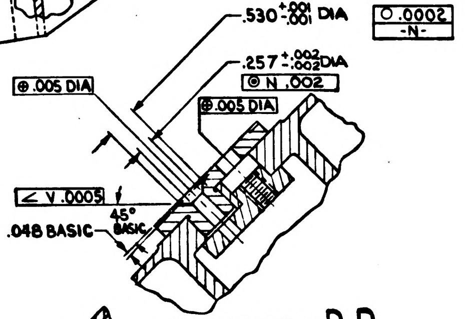

SEE DETAIL A
NOTE .0002 5
5.884 +.003 -.003

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C		REPLACES WORDING PER TDRR 02405		5 Aug 63	R.W.G wt
D2		REVISED PER TDRR NO 03102			
E2		REVISED PER TDRR NO. 03674		2 Oct 63	wt



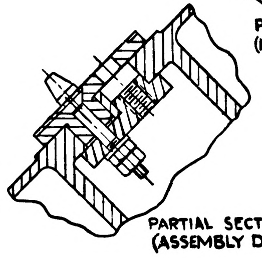
(REF) 7/16
1/2 (REF)
D
D
3
7
1/16 (REF)
SURFACE V
11/16 (REF)
.437 BASIC
.500 BASIC
11.000 BASIC
9.750 BASIC
10.000 BASIC
SURFACE T
5
9
A
11 S .0005
11.750 BASIC
-H-
11 S 5 SEC
4
11/16 (REF)
2
6
SURFACE W
4.875
B
B
1/16 (REF)
.625 BASIC
8
4
SURFACE U
C
C
1/2 (REF)
(REF) 7/16
16 .128 +.001 -.000 DIA. THRU 2 PLACES 3
1



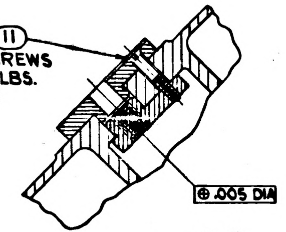


.530 +.001 -.000 DIA
0.0002 -N-
.257 +.002 -.002 DIA
⊕ N .002
⊕ .005 DIA
⊕ .005 DIA
∠ V .0005
45° BASIC
.048 BASIC

PARTIAL SECTION D-D (MACHINING DETAIL)

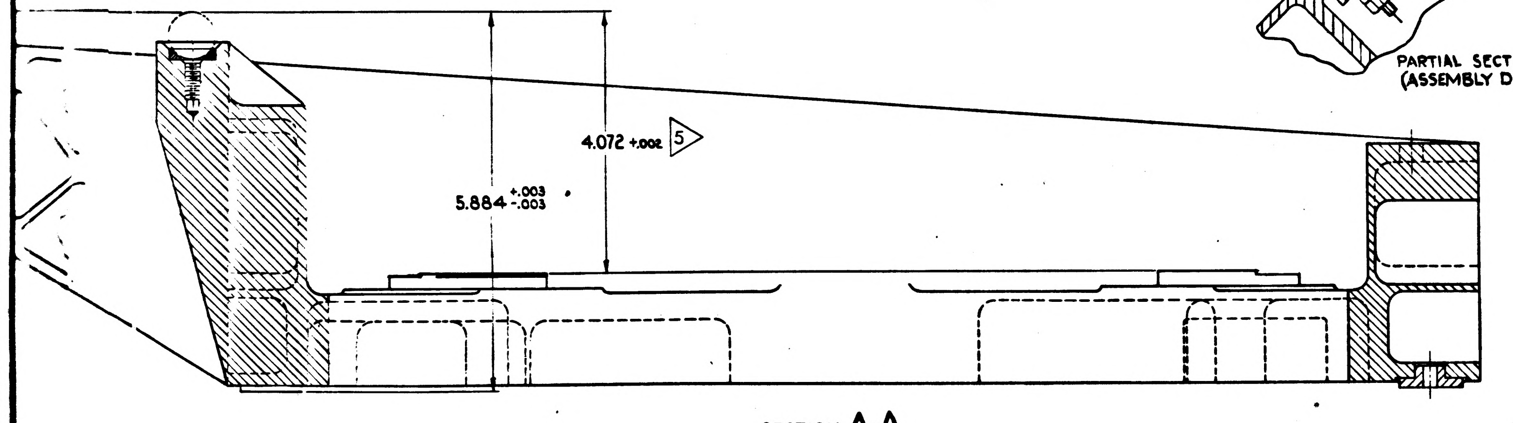


PARTIAL SECTION D-D (ASSEMBLY DETAIL)



12 REQ'D 11 TORQUE SCREWS TO 60 ±3 IN. LBS. 12 PLACES
⊕ .005 DIA

PARTIAL SECTION C-C 2 PLACES



4.072 ±.002 5
5.884 +.003 -.003

SECTION A-A

REPLACES REV "B" WITH CHANGES

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	3	MS-21209-F4-15	INSERT-SELF LOCKING
16	4	MS-171528	PIN SPRING
15	4	MS-21209-F5-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	899963	" " " L H REAR
7	1	899962	" " " R H FRONT
6	1	899961	" " " L H FRONT
5	1	899960	PAD-MOUNTING R H REAR
4		899959	L H REAR
3		899958	R H FRONT
2		899957	" " " L H FRONT
		899981	STRUCTURAL ASSY-NAV. BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-021	1899950-021

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS +.005 -.005 ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Ezyda DATE 5-17-63
CHECKED J Kern 7-22-63
APPROVAL J. HANN 7-22-63
APPROVAL 8/7/63
NASA APPROVAL
MIT APPROVAL W Wagle 7/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY
NAVIGATION BASE INNER

CODE IDENT NO.
SIZE J
1899982
SCALE
SHEET

1899982 E

INCHES
PHOTOGRAPHIC SCALE ONLY

F-2

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16√

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.

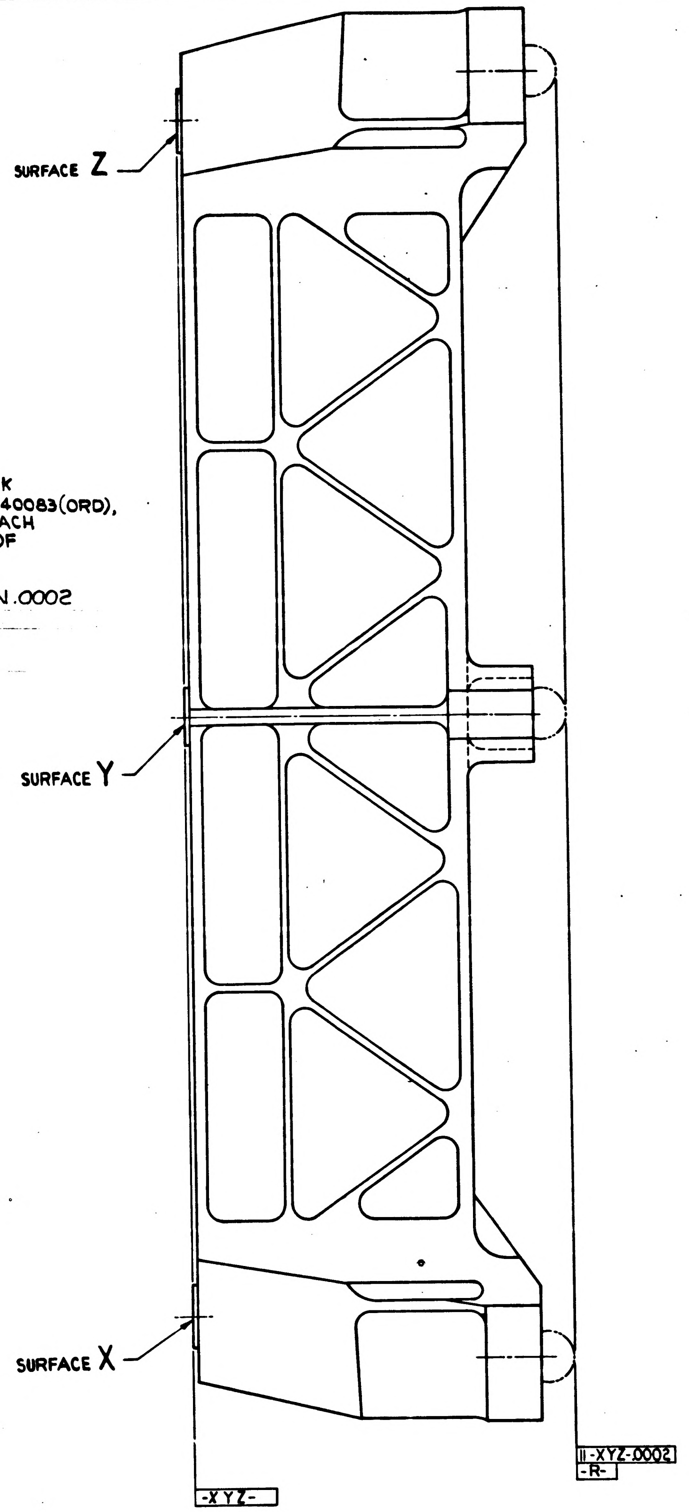
2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

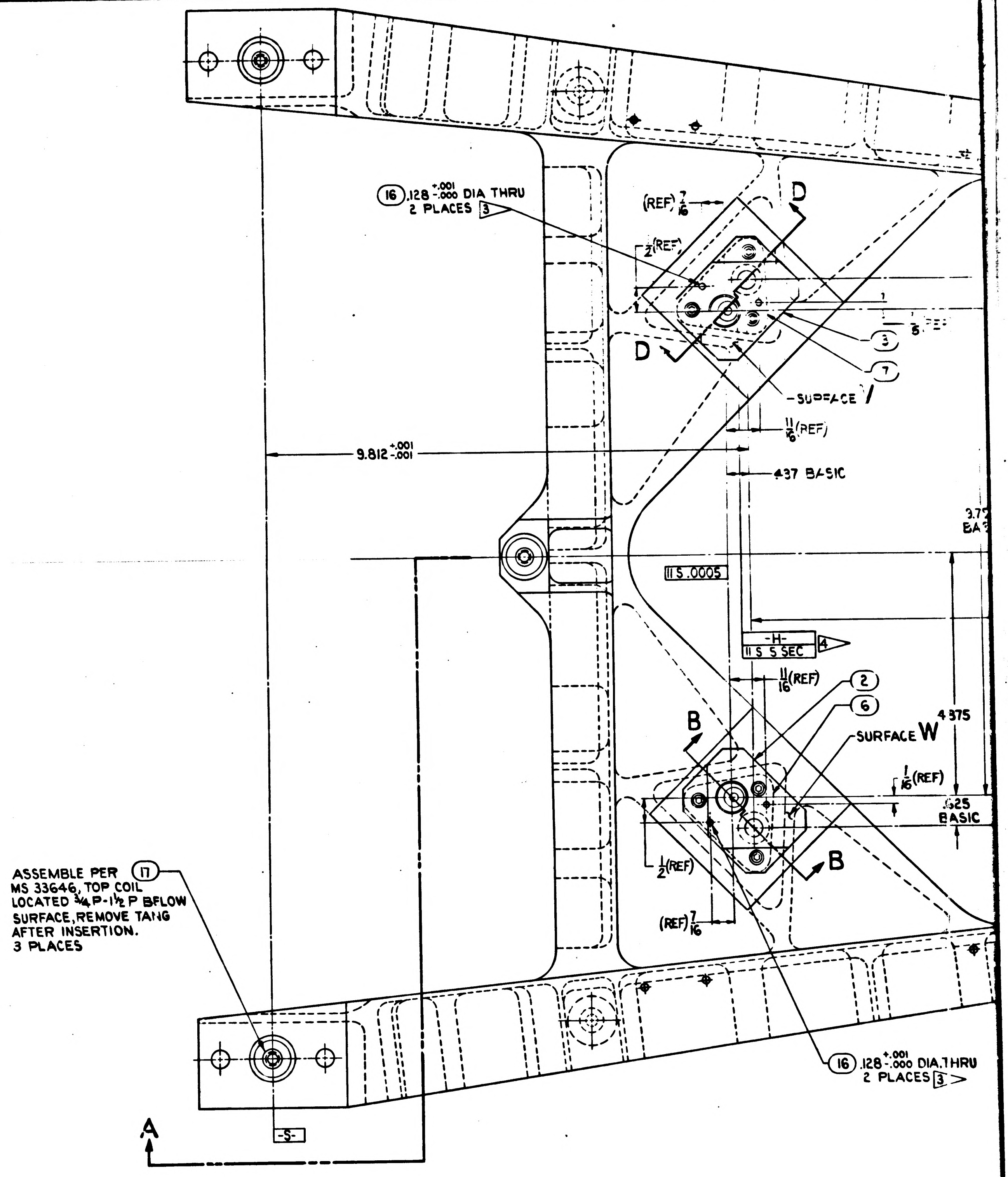
3▷ INSERT PINS 1/16 BELOW SURFACES "V" & "W" PRIOR TO FINISH MACHINING OF THESE SURFACES.

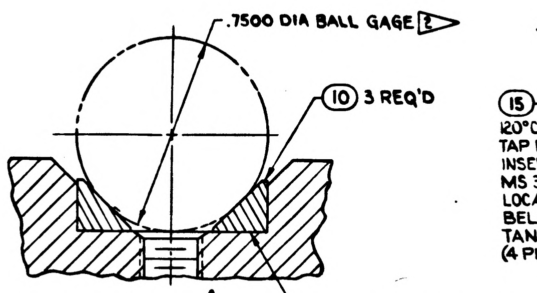
4▷ AFTER ADJUSTMENT OF DATUM -H- TO -S- TORQUE 1 EACH OF ITEM 14 (2 PLACES TO 85±5 IN.LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-. APPLY COMPOUND, MIL-S-40083(ORD), CLASS 30, TO THREADS OF ITEM 12 (2 PLACES). TORQUE 1 EACH ITEM 14 (2 PLACES) TO 60±5 IN-LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-

5▷ THE ESTABLISHED DIMENSION SHALL NOT VARY MORE THAN .0002 FROM SURFACE R TO ANY POINT ON SUFACES T,U,V & W

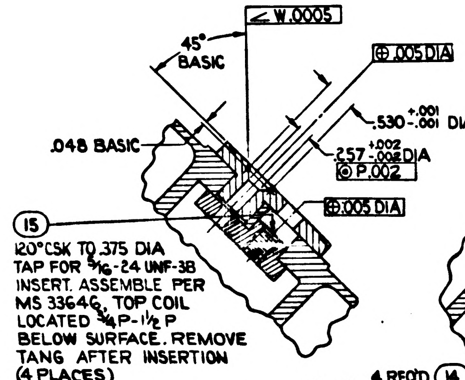
6▷ IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND1002023.


SURFACE Z
SURFACE Y
SURFACE X
-XYZ-
∥ -XYZ- .0002
-R-

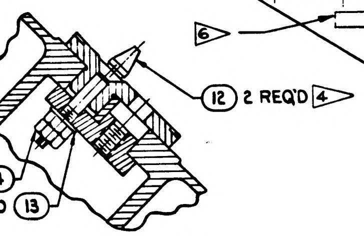

⑯ .128 +.001 -.000 DIA THRU 2 PLACES 3▷
(REF) 7/16
2 (REF)
D
D
③
⑦
-SURFACE V
11/16 (REF)
9.812 +.001 -.001
.437 BASIC
3.75 BA
∥ S .0005
-H-
∥ S S SEC
4▷
11/16 (REF)
②
⑥
B
SURFACE W
4.375
1/16 (REF)
.625 BASIC
1/2 (REF)
B
(REF) 7/16
ASSEMBLE PER ⑰ MS 33646, TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE, REMOVE TANG AFTER INSERTION. 3 PLACES
⑯ .128 +.001 -.000 DIA THRU 2 PLACES 3▷
A
-S-


.7500 DIA BALL GAGE 2▷
⑩ 3 REQ'D
1▷ THIS SURFACE ONLY

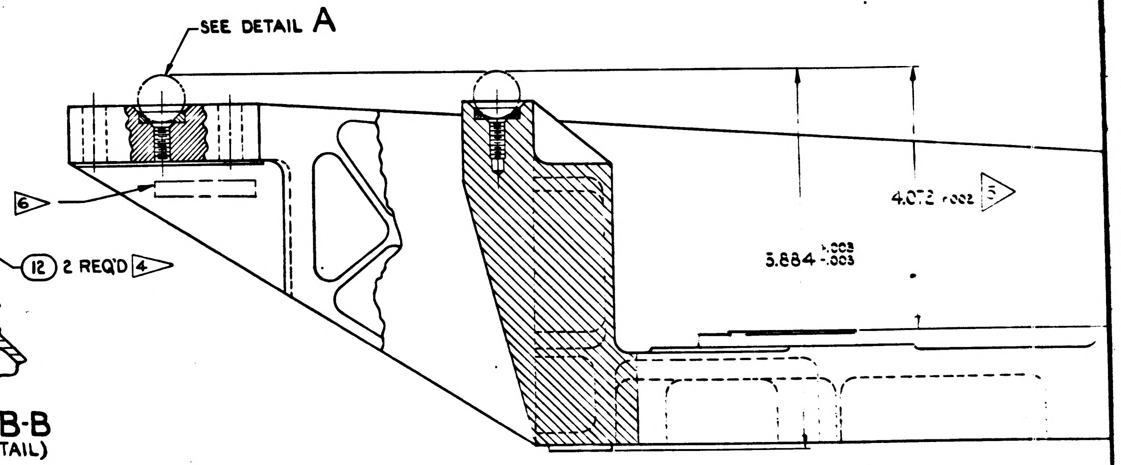
DETAIL A
SCALE 4:1


∠ W .0005
45° BASIC
⊕ .005 DIA
.530 +.001 -.001 DIA
○ .0002 -P-
.048 BASIC
.257 +.002 -.002 DIA
◎ P .002
⊕ .005 DIA
⑮
120° CSK TO .375 DIA TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS 33646, TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION (4 PLACES)

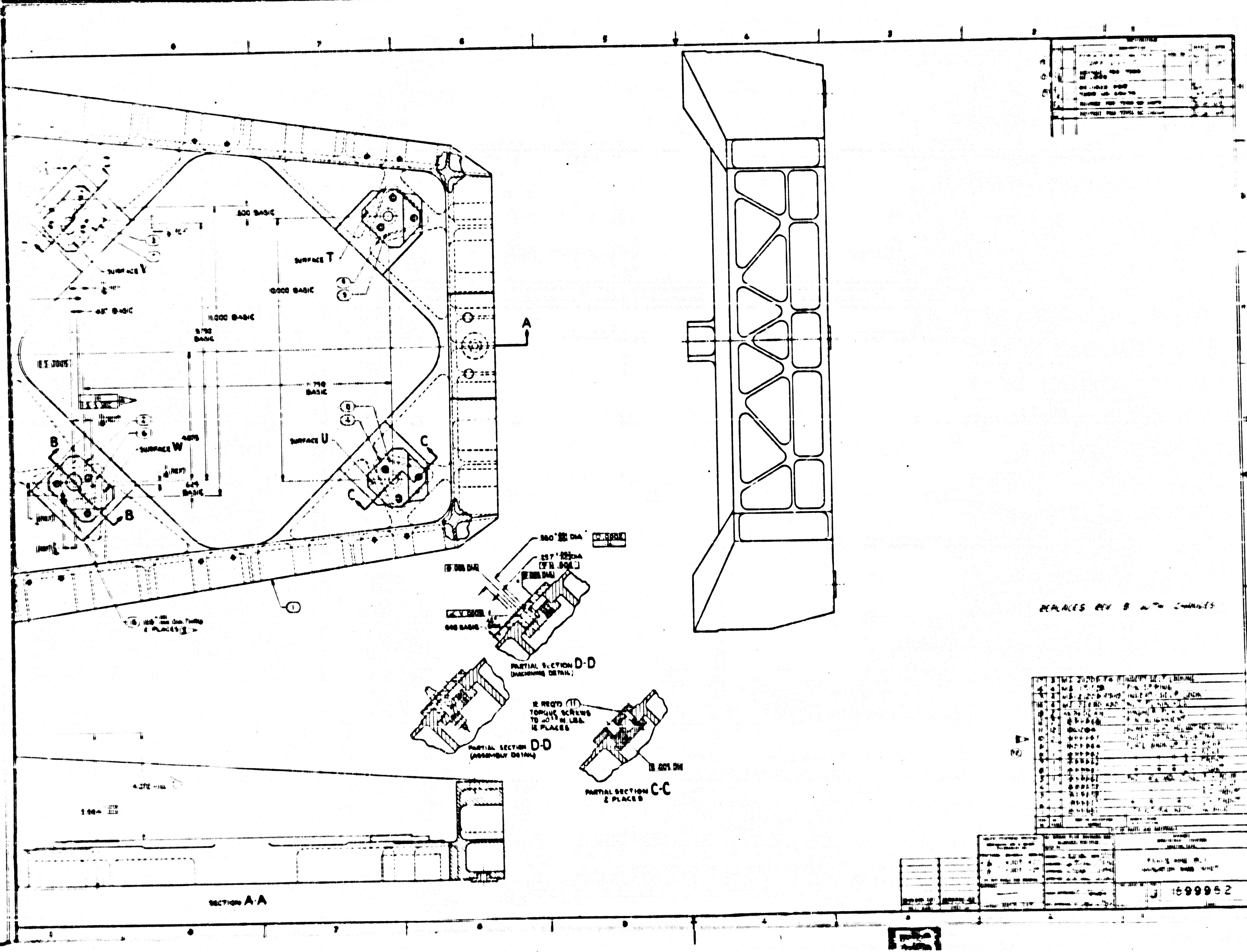
PARTIAL SECTION B-B
(MACHINING DETAIL)


⑫ 2 REQ'D 4▷
4 REQ'D ⑭
2 REQ'D ⑬

PARTIAL SECTION B-B
(ASSEMBLY DETAIL)


SEE DETAIL A
6▷
4.072 ±.002 5▷
3.884 +.003 -.003

INCHES
PHOTOGRAPHIC SCALE ONLY



SURFACE T
SURFACE Y
SURFACE W
SURFACE U
.500 BASIC
10.000 BASIC
11.000 BASIC
5.750 BASIC
7.750 BASIC
A
B
C
.580 DIA
.257 DIA
.040 BASIC
PARTIAL SECTION D-D (MACHINING DETAIL)
PARTIAL SECTION D-D (ASSEMBLY DETAIL)
12 REQ'D (11) TORQUE SCREWS TO 40 IN. LBS. 12 PLACES
PARTIAL SECTION C-C 2 PLACES
SECTION A-A
4.372
1.984
REPLACES REV B WITH CHANGES
J 1699952

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER
SURFACE ROUGHNESS SHALL NOT EXCEED ▽

MUST BE FREE FROM BURRS.
SURFACES "U, V & W" MUST BE FLAT WITHIN .0001
SURFACE "U, V & W" MUST BE PARALLEL WITH SURFACE
Z WITHIN .0002

INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.

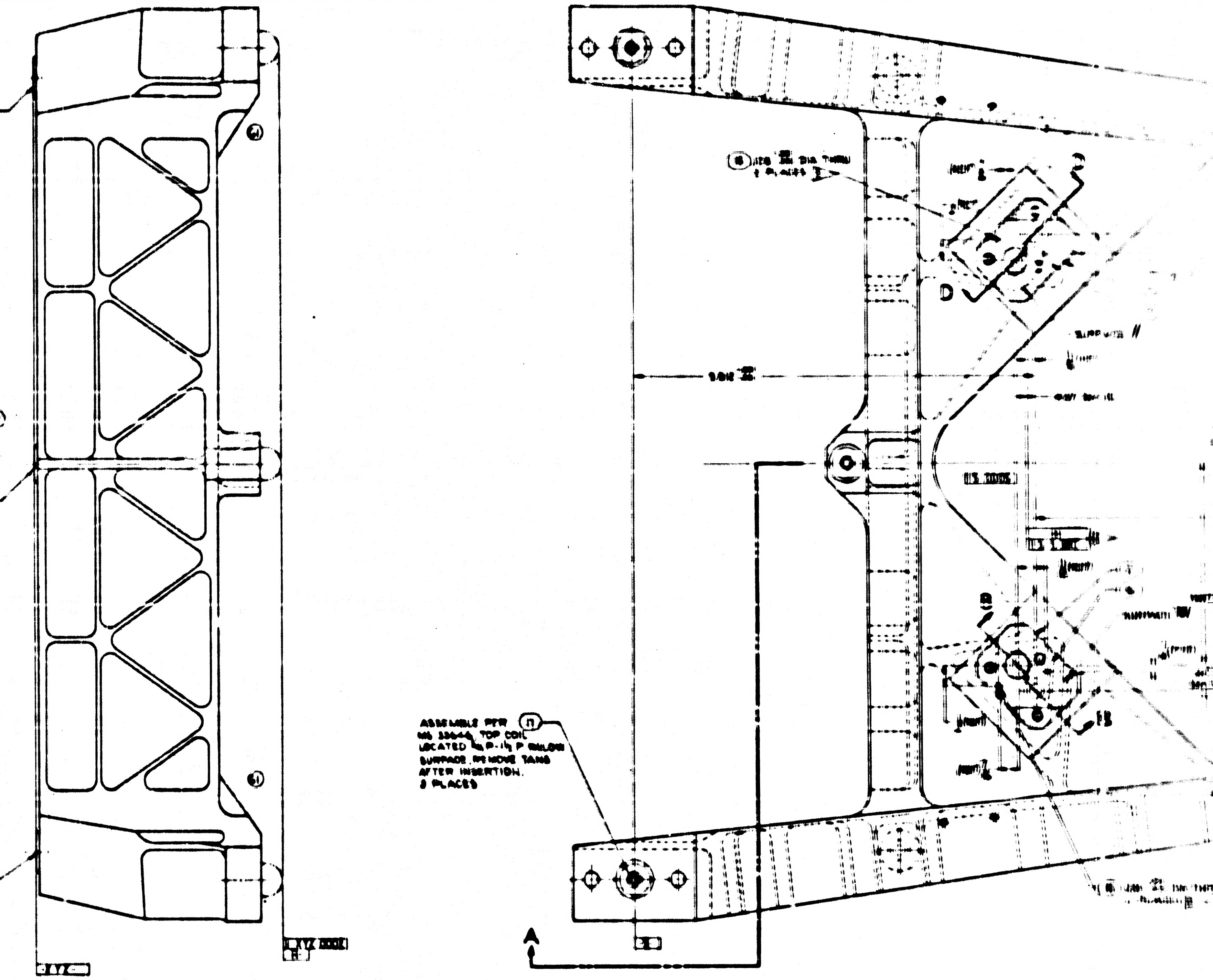
THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .00010 TOLERANCE ZONE

INSERT PINS 1/16 BELOW SURFACES "V" & "W" PRIOR TO FINISH MACHINING OF THESE SURFACES.

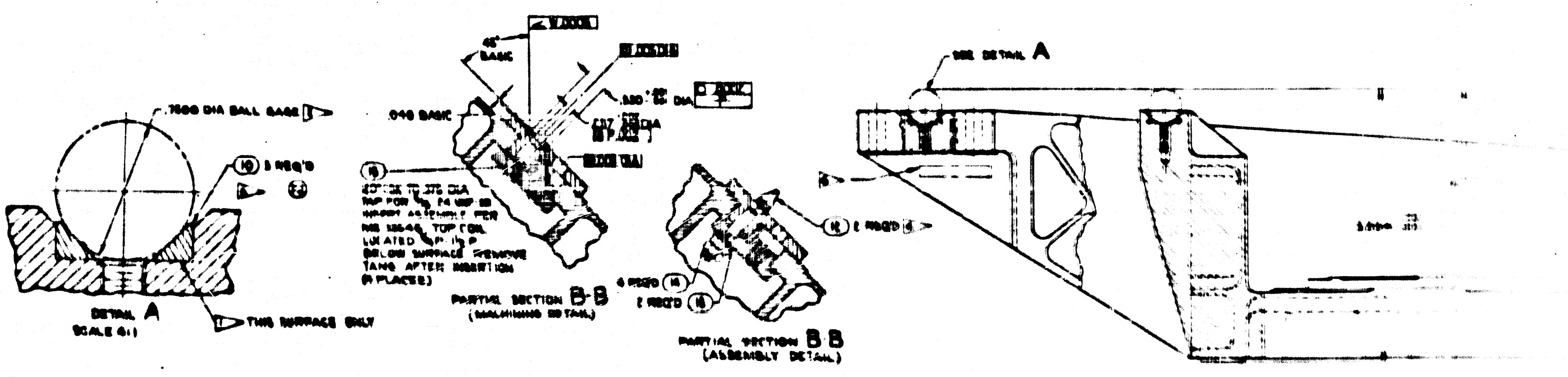
AFTER ADJUSTMENT OF DATUM -F- TO -E- TORQUE EACH OF ITEM 16 (2 PLACES) TO 35 IN-LBS RECHECK ALIGNMENT OF DATUM -F- TO -E-. APPLY COMPOUND, MIL-S-46163(ORD), CLASS 10, TO THREADS OF ITEM 18 (2 PLACES). TORQUE EACH ITEM 18 (2 PLACES) TO 60 IN-LBS RECHECK ALIGNMENT OF DATUM -F- TO -E-

THE ESTABLISHED DIMENSION SHALL NOT VARY MORE THAN .0002 FROM SURFACE Z TO ANY POINT ON SURFACES "U, V & W". ITEM (10) TO BE SUBJECTED TO [illegible] AXIAL PRELOAD AFTER ASSEMBLY AND PRIOR TO FINAL MACHINING OF SURFACES "U, V & W"

IDENTIFY WITH DRAWING NO., REVISION LETTER, AND SERIAL NO. PER [illegible]



SURFACE Z
SURFACE Y
SURFACE X
D
A
ASSEMBLE PER (17) MS 33646, TOP COIL LOCATED [illegible] BELOW SURFACE. REMOVE TANG AFTER INSERTION. 2 PLACES



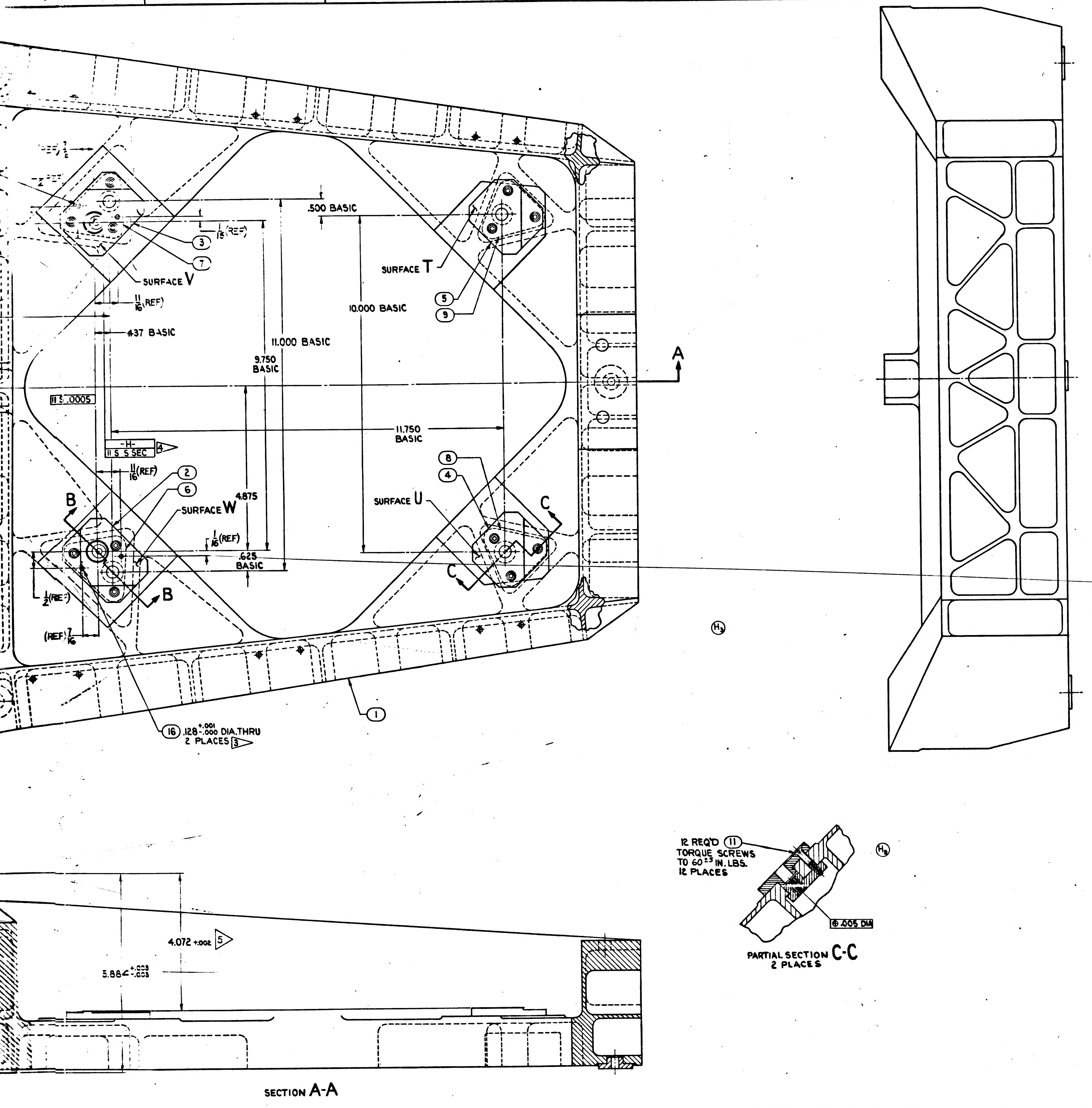
.7500 DIA BALL GAGE
(10) 3 REQ'D
THIS SURFACE ONLY
45° BASIC
.045 BASIC
SEE DETAIL A
(16) 2 REQ'D
4 REQ'D (15)
2 REQ'D (18)

DETAIL A
SCALE 4:1

PARTIAL SECTION B-B
(MACHINING DETAIL)

PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C		REPLACES WORDDWG PER TDRR 02405		5 Aug 63	R.W.G WK
D2		REVISED PER TDRR NO. 03102			
E2		REVISED PER TDRR NO. 03674		21 OCT 63	WK
F2		REVISED PER TDRR NO. 04072		30 OCT 63	WK
G		REVISED PER TDRR NO. 04064		30 OCT 63	WK
H4		REVISED PER TDRR NO. 06740		10 MAR 64	WK



SURFACE V
SURFACE T
SURFACE U
SURFACE W
.500 BASIC
1/16 (REF)
11/16 (REF)
.437 BASIC
11.000 BASIC
10.000 BASIC
9.750 BASIC
11.750 BASIC
4.875
.625 BASIC
1/16 (REF)
1/2 (REF)
(REF) 7/16
11 S .0005
-H-
11 S .5 SEC
4
A
B
C
1
2
3
4
5
6
7
8
9
16 .128 +.001 -.000 DIA.THRU 2 PLACES 3
H3
12 REQ'D 11 TORQUE SCREWS TO 60 ±3 IN. LBS. 12 PLACES
.005 DIA
PARTIAL SECTION C-C 2 PLACES
4.072 +.002 5
5.884 +.003 -.003
SECTION A-A

REPLACES REV "B" WITH CHANGES

5 F2

17	3	MS-21209-F4-15	INSERT-SELF LOCKING
16	4	MS-171528	PIN SPRING
15	4	MS-21209-FS-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD- MU MOUNTING, R H REAR
4	1	1899959	L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899981	STRUCTURAL ASSY-NAV. BASE
ITEM NO.	NO. REQ'D	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-021	1899950-021

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+2°
- 1/16	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C Zynda DATE 6/11/63
CHECKED J Kern 7-22-63
APPROVAL J. HANN 7-22-63
APPROVAL 8/7/63
NASA APPROVAL
MIT APPROVAL W Hoag 7/4/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY
NAVIGATION BASE (INSEP)

CODE IDENT NO.
SIZE J
1899982
SCALE 1:1
SHEET

1899982 H

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16√

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1 ▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.

2 ▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

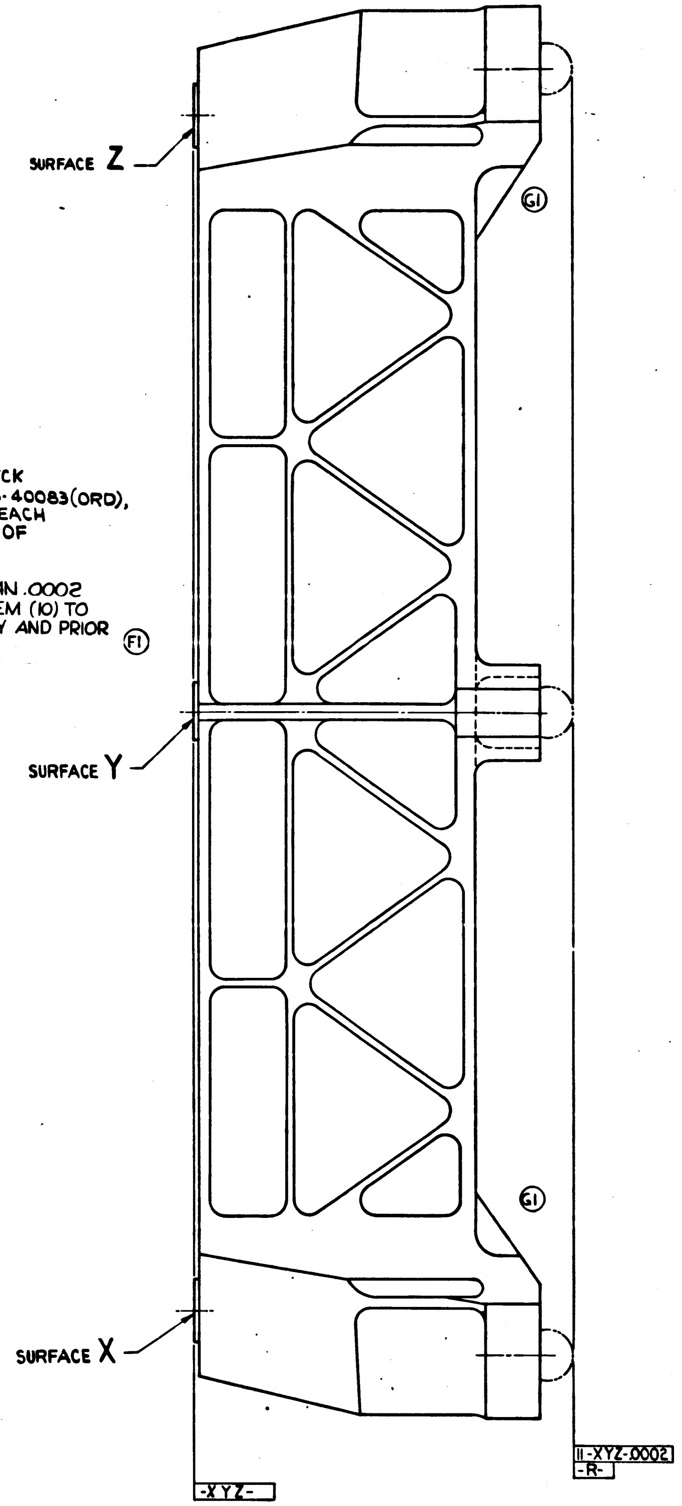
3 ▷ INSERT PINS 1/16 BELOW SURFACES "V" & "W" PRIOR TO FINISH MACHINING OF THESE SURFACES.

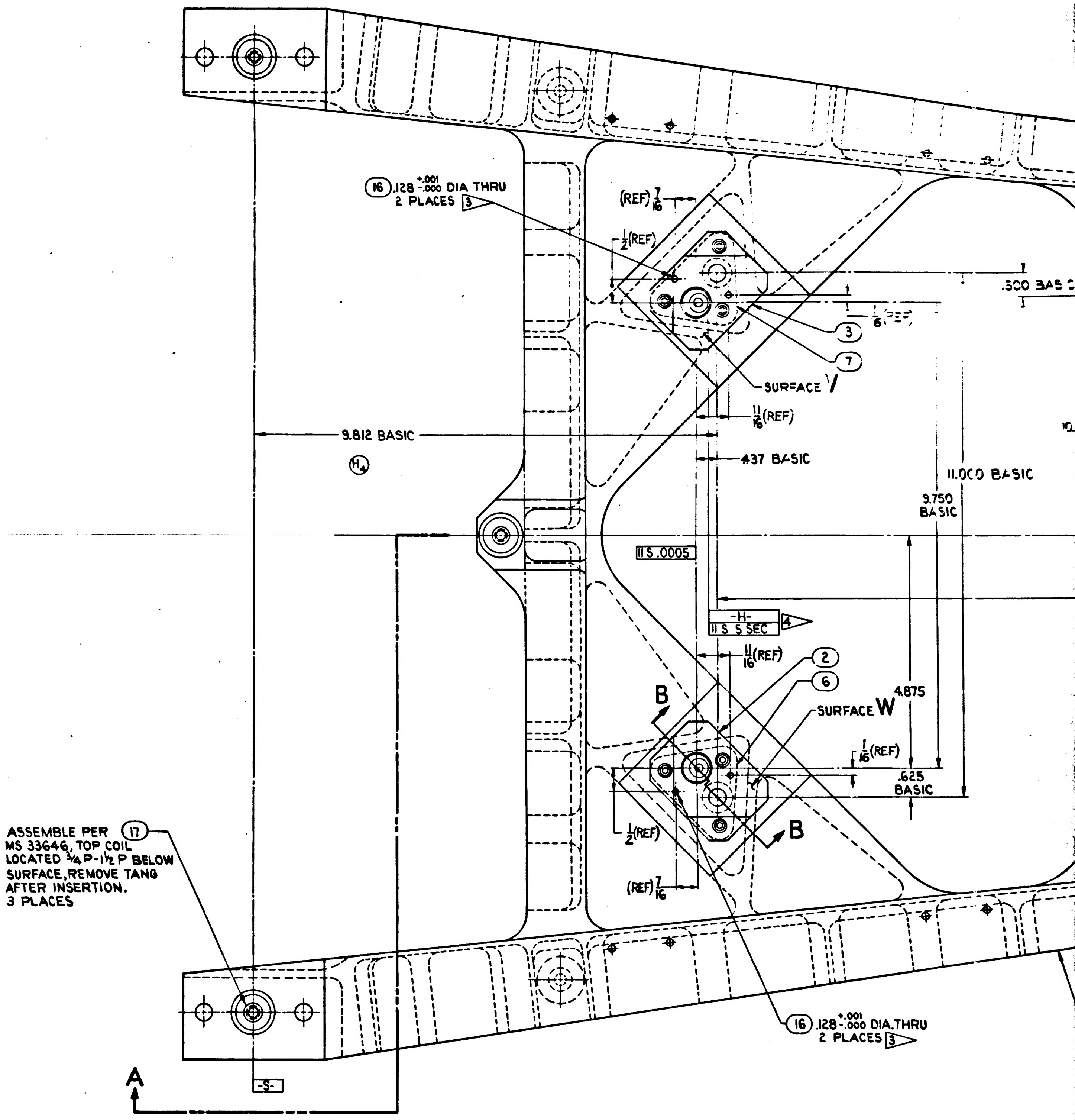
4 ▷ AFTER ADJUSTMENT OF DATUM -H- TO -S- TORQUE 1EACH OF ITEM 14 (2 PLACES TO 85±5 IN.LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-. APPLY COMPOUND, MIL-S-40083(ORD), CLASS 30, TO THREADS OF ITEM 12 (2 PLACES). TORQUE 1EACH ITEM 14 (2 PLACES) TO 60±5 IN-LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-

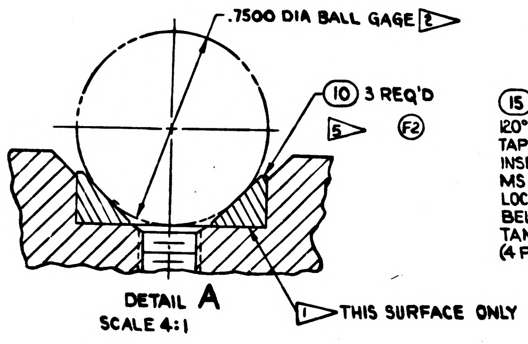
5 ▷ THE ESTABLISHED DIMENSION SHALL NOT VARY MORE THAN .0002 FROM SURFACE R TO ANY POINT ON SUFACES T, U, V, & W. ITEM (10) TO BE SUBJECTED TO 500 LBS. AXIAL PRELOAD AFTER ASSEMBLY AND PRIOR TO FINAL MACHINING OF SURFACES T,U,V&W

6 ▷ IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND1002023.

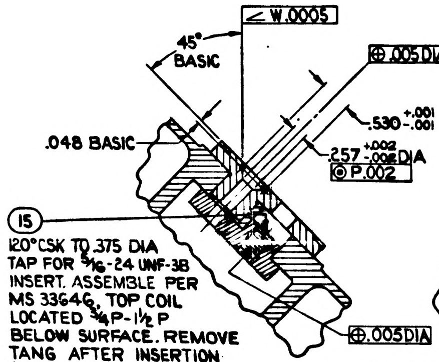
(F1)


SURFACE Z
SURFACE Y
SURFACE X
(G1)
(G1)
-XYZ-
11-XYZ-.0002
-R-


(16) .128 +.001 -.000 DIA THRU 2 PLACES 3
(REF) 7/16
1/2(REF)
.500 BASIC
1/16(REF)
(3)
(7)
SURFACE V
11/16(REF)
9.812 BASIC
(H4)
.437 BASIC
11.000 BASIC
9.750 BASIC
11 S .0005
-H-
11 S S SEC
4
11/16(REF)
(2)
(6)
B
SURFACE W
4.875
1/16(REF)
.625 BASIC
1/2(REF)
B
(REF) 7/16
ASSEMBLE PER (17) MS 33646, TOP COIL LOCATED 3/4P-1½P BELOW SURFACE, REMOVE TANG AFTER INSERTION. 3 PLACES
(16) .128 +.001 -.000 DIA.THRU 2 PLACES 3
A
-S-

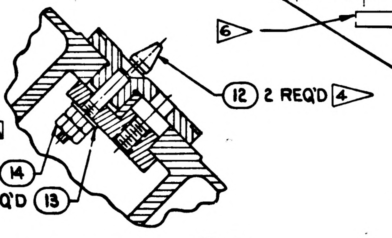

.7500 DIA BALL GAGE 2
(10) 3 REQ'D
5
(F2)
1 THIS SURFACE ONLY

DETAIL A
SCALE 4:1

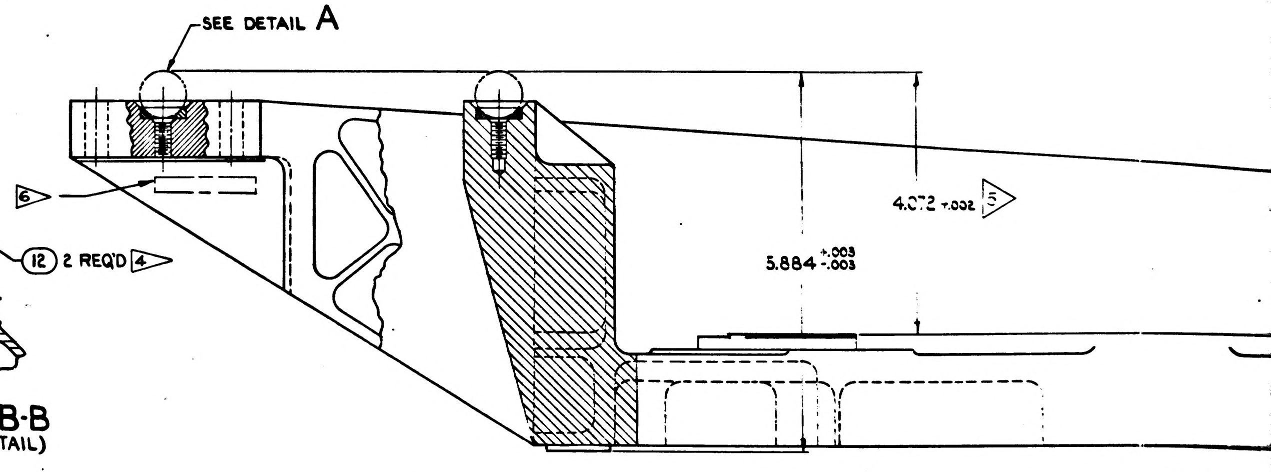

W .0005
45° BASIC
⊕ .005 DIA
.530 +.001 -.001 DIA
○ .0002
-P-
.048 BASIC
.257 +.002 -.002 DIA
◎ P .002
(15)
120° CSK TO .375 DIA TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS 33646, TOP COIL LOCATED 3/4P-1½P BELOW SURFACE. REMOVE TANG AFTER INSERTION (4 PLACES)
⊕ .005 DIA

PARTIAL SECTION B-B
(MACHINING DETAIL)
2 PLACES

(H1)

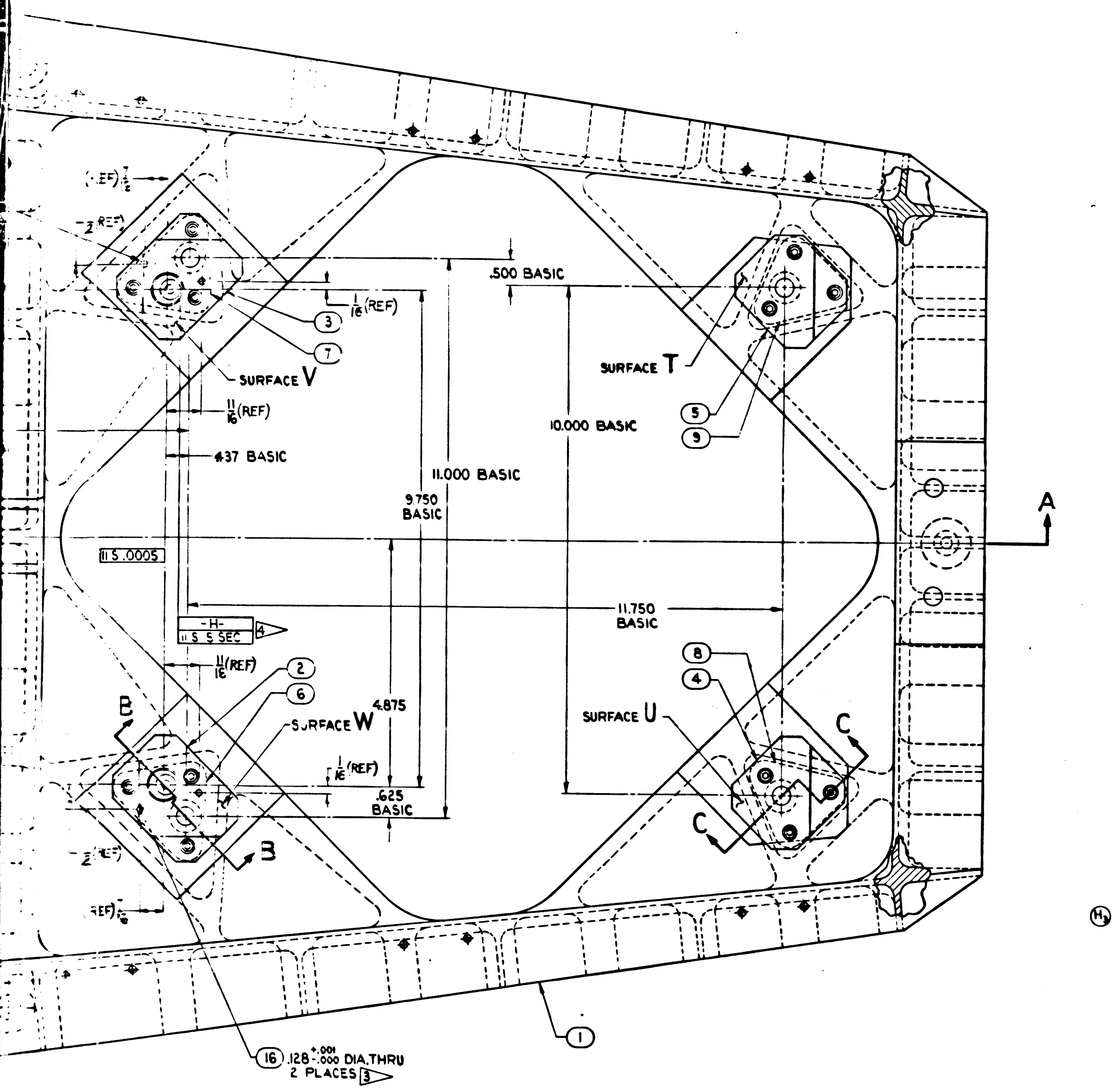

(12) 2 REQ'D 4
4 REQ'D (14)
2 REQ'D (13)

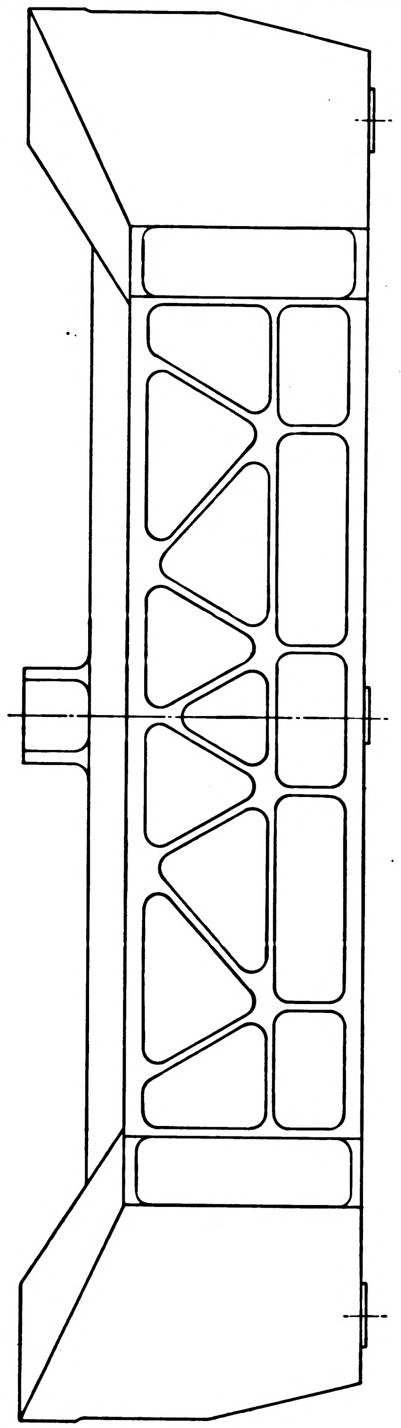
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)


SEE DETAIL A
6
4.072 ±.002 5
5.884 +.003 -.003

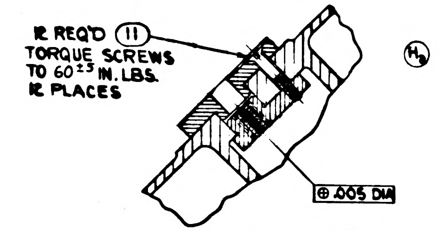
SECTION A-A

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		REPLACES WORDING PER TDRR 02405		[illegible]	WK
D2		REVISED PER TDRR NO 03102			
E2		REVISED PER TDRR NO. 03674		21 OCT 63	WK
F2		REVISED PER TDRR NO. 04072		30 OCT 63	WK
G		REVISED PER TDRR NO. 04064		30 OCT 63	WK
H4		REVISED PER TDRR NO. 06740		10 MAR 64	WK
J		REVISED PER TDRR 06939		27 MAR 64	JJJ

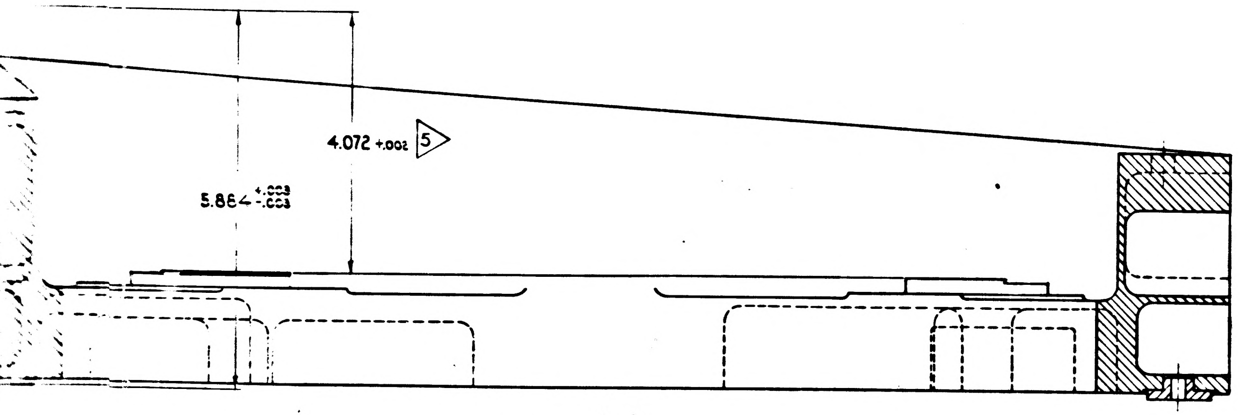

(REF) 1/2
1/2 REF
3
7
1/16 (REF)
SURFACE V
11/16 (REF)
.437 BASIC
.500 BASIC
SURFACE T
5
9
10.000 BASIC
11.000 BASIC
9.750 BASIC
A
11 S .0005
-H-
11 S .5 SEC 4
11.750 BASIC
8
4
11/16 (REF)
2
6
B
SURFACE W
4.875
SURFACE U
C
1/16 (REF)
.625 BASIC
C
B
1/2 REF
REF 1/16
H3
1
16 .128 +.001 -.000 DIA. THRU 2 PLACES 3



REPLACES REV 'B' WITH CHANGES


12 REQ'D 11 TORQUE SCREWS TO 60 ±3 IN. LBS. 12 PLACES
H3
⊕ .005 DIA

PARTIAL SECTION C-C
2 PLACES


4.072 ±.002 5
5.884 +.003 -.003

SECTION A-A

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	3	MS-21209-F4-15	INSERT-SELF LOCKING
16	4	MS-171528	PIN SPRING
15	4	MS-21209-FS-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-IMU MOUNTING, R H REAR
4	1	1899959	L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899981	STRUCTURAL ASS'Y-NAV. BASE

5 (F2)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-021	1899950-021

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+2°
- 1/16	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN X Zynda DATE 6/17/63
CHECKED J Kern 7-22-63
APPROVAL J Hann 7-22-63
APPROVAL [illegible] 8/7/63
NASA APPROVAL [illegible]
MIT APPROVAL W [illegible] 7/4/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY
NAVIGATION BASE (INSEP)

CODE IDENT NO.
SIZE J
1899982
SCALE 1:1
SHEET

1899982 J

2/1899982

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER
SURFACE ROUGHNESS SHALL NOT EXCEED 16/

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.

2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

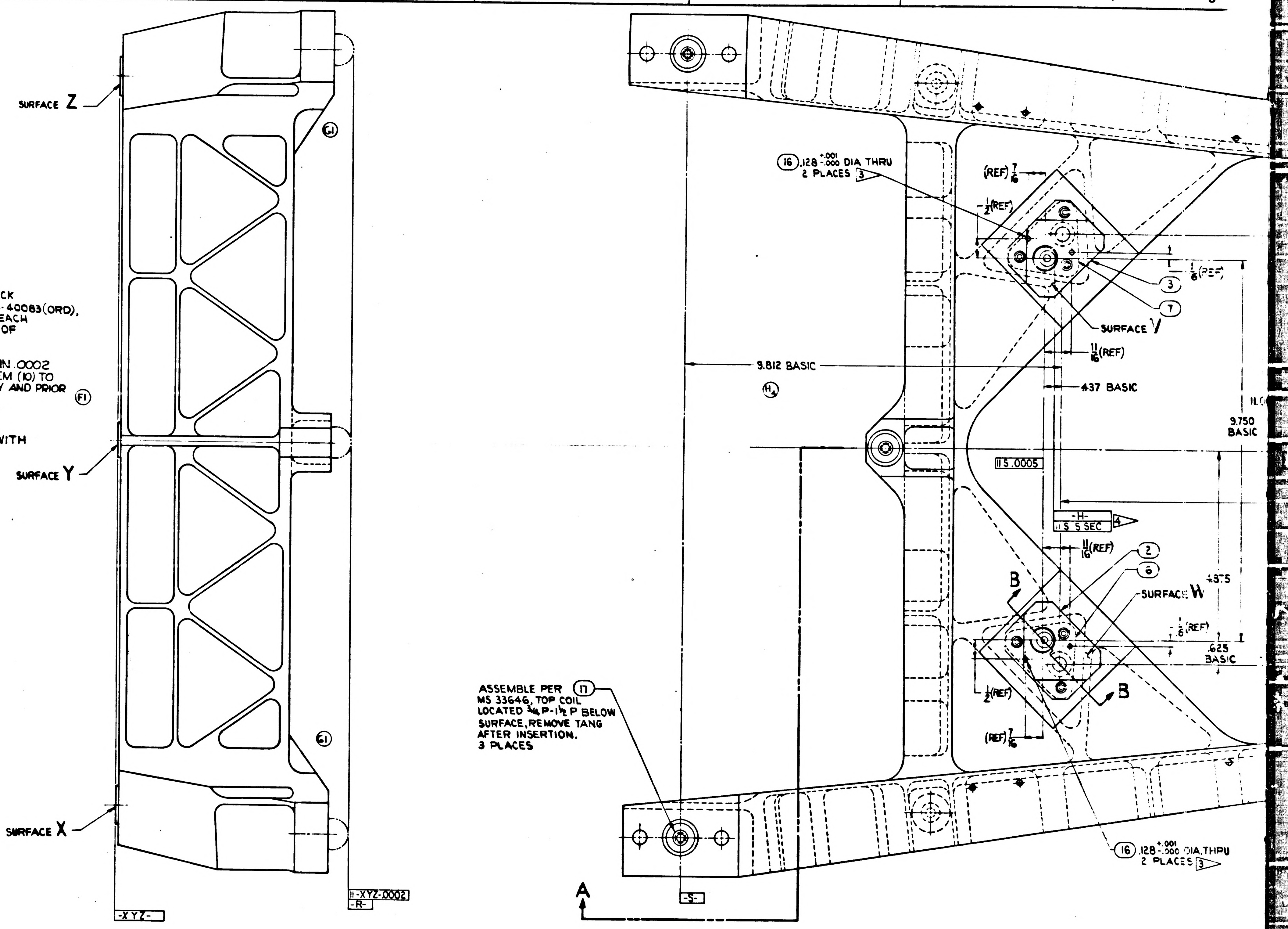
3▷ INSERT PINS 1/16 BELOW SURFACES "V" & "W" PRIOR TO FINISH MACHINING OF THESE SURFACES.

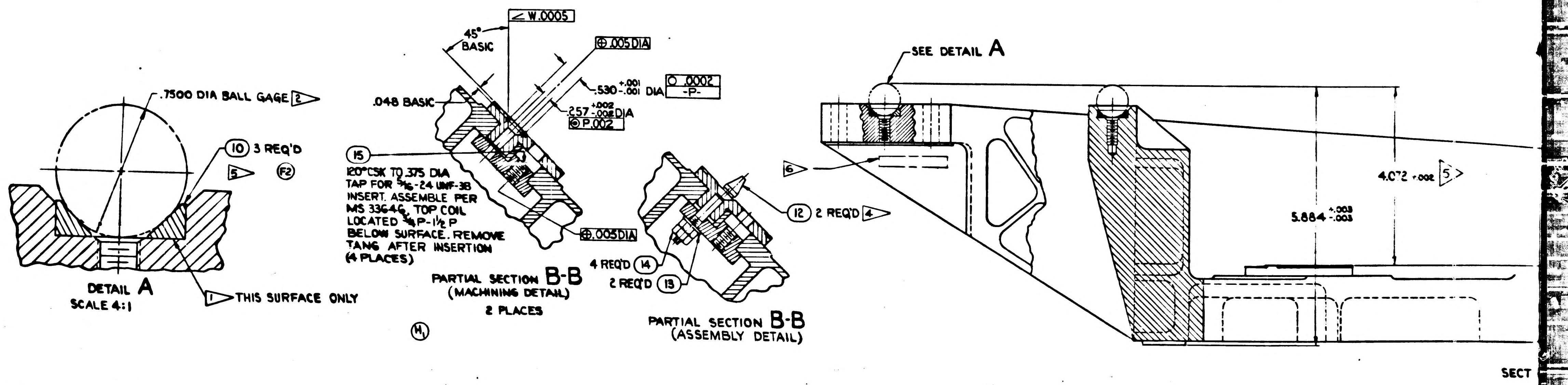
4▷ AFTER ADJUSTMENT OF DATUM -H- TO -S- TORQUE I EACH OF ITEM 14 (2 PLACES TO $85^{\pm5}$ IN LBS RECHECK ALIGNMENT OF DATUM -H- TO -S-. APPLY COMPOUND, MIL-S-40083(ORD), CLASS 30, TO THREADS OF ITEM 12 (2 PLACES). TORQUE I EACH ITEM 14 (2 PLACES) TO $60^{\pm5}$ IN-LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-

5▷ THE ESTABLISHED DIMENSION SHALL NOT VARY MORE THAN .0002 FROM SURFACE R TO ANY POINT ON SUFACES T, U, V, & W. ITEM (10) TO BE SUBJECTED TO 500 LBS. AXIAL PRELOAD AFTER ASSEMBLY AND PRIOR TO FINAL MACHINING OF SURFACES T,U,V,&W

6▷ IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND1002023.

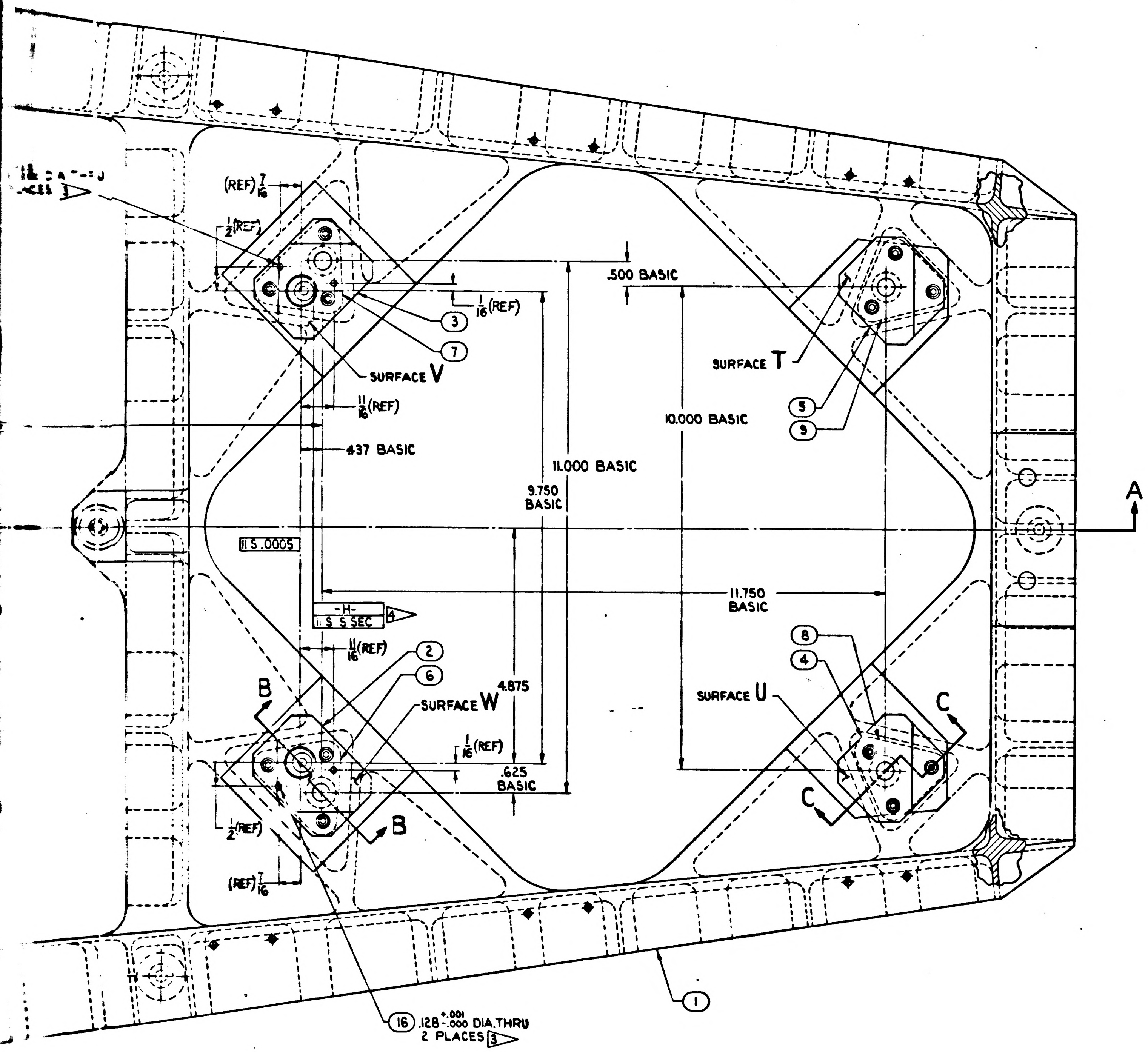
Ⓙ PERFORM INTERFACE ALIGNMENT TEST IN ACCORDANCE WITH ATP-1899982

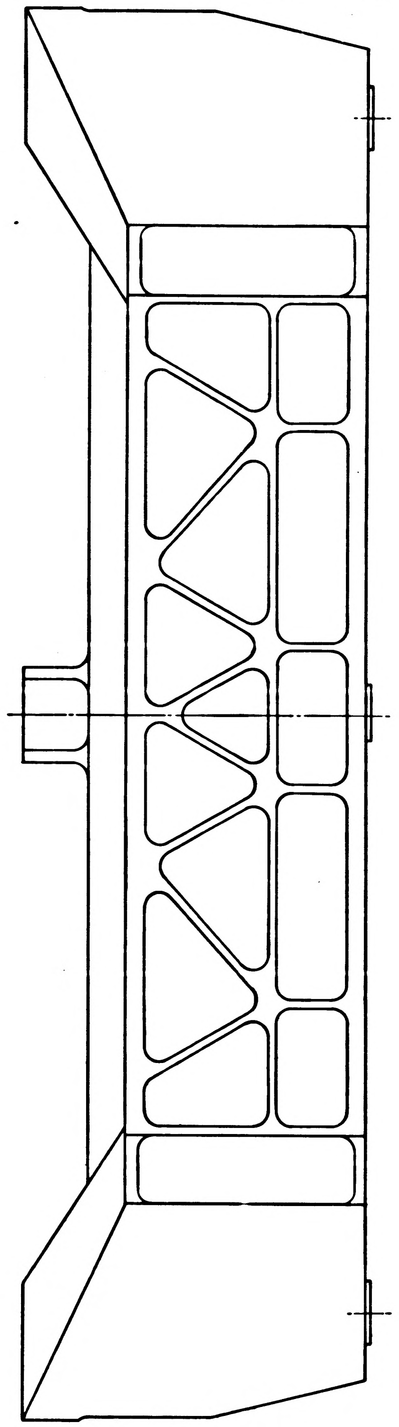

SURFACE Z
SURFACE Y
SURFACE X
G1
F1
-XYZ-
∥-XYZ-.0002
-R-
(16) .128 +.001 -.000 DIA THRU
2 PLACES 3▷
(REF) 7/16
1/2 (REF)
1/6 (REF)
3
7
SURFACE V
11/16 (REF)
9.812 BASIC
H4
.437 BASIC
11.0
9.750 BASIC
∥ S .0005
-H-
∥ S 5 SEC
4▷
2
6
B
SURFACE W
4.875
.625 BASIC
ASSEMBLE PER (17) MS 33646, TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE, REMOVE TANG AFTER INSERTION. 3 PLACES
(16) .128 +.001 -.000 DIA. THRU
2 PLACES 3▷
A
-S-


.7500 DIA BALL GAGE 2▷
(10) 3 REQ'D
5▷
F2
DETAIL A
SCALE 4:1
1▷ THIS SURFACE ONLY
∠ W.0005
45° BASIC
⊕ .005 DIA
.530 +.001 -.001 DIA
○ .0002
-P-
.048 BASIC
.257 +.002 -.002 DIA
◎ P .002
(15)
120° CSK TO .375 DIA TAP FOR 5/16-24 UNF-3B INSERT. ASSEMBLE PER MS 33646, TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE. REMOVE TANG AFTER INSERTION (4 PLACES)
⊕ .005 DIA
PARTIAL SECTION B-B
(MACHINING DETAIL)
2 PLACES
H1
(12) 2 REQ'D 4▷
4 REQ'D (14)
2 REQ'D (13)
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)
SEE DETAIL A
6▷
4.072 ±.002 5▷
5.884 +.003 -.003
SECT

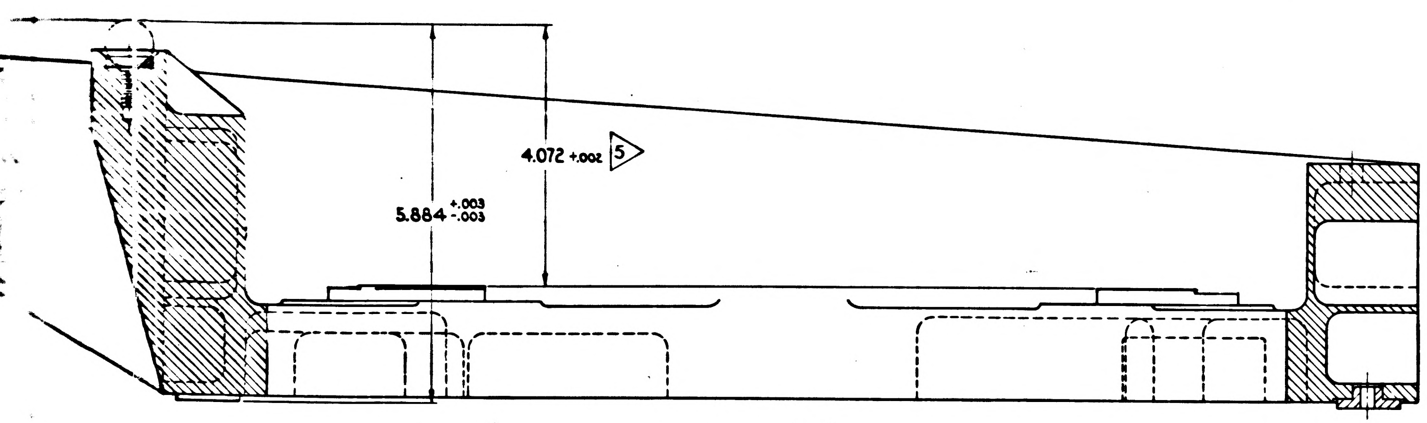
1/1899982

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C		REPLACES WORK DWG PER TDRR 02405		5 Aug 63	R.W.G. WK
D2		REVISED PER TDRR NO 03102			
E2		REVISED PER TDRR NO. 03674		21 OCT 63	WK
F2		REVISED PER TDRR NO. 04072		30 OCT 63	WK
G		REVISED PER TDRR NO. 04064		30 OCT 63	WK
H4		REVISED PER TDRR NO. 06740		3 MAR 64	WK
J		REVISED PER TDRR 06939		27 MAR 64	JJJ
K		REVISED PER TDRR 3050		6 OCT 64	JWP

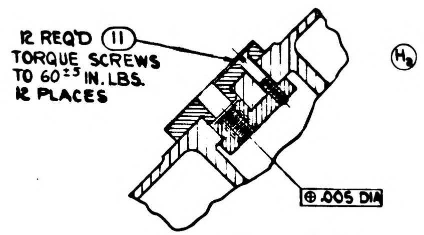

(REF) 7/16
1/2 (REF)
.500 BASIC
1/16 (REF)
3
7
SURFACE V
SURFACE T
5
9
11/16 (REF)
.437 BASIC
10.000 BASIC
11.000 BASIC
9.750 BASIC
A
11 S .0005
-H-
11 S S SEC 4
11.750 BASIC
11/16 (REF)
2
6
4.875
8
4
SURFACE U
B
SURFACE W
C
1/16 (REF)
.625 BASIC
C
B
1/2 (REF)
(REF) 7/16
H4
1
16 .128 +.001 -.000 DIA. THRU 2 PLACES 3



REPLACES REV 'B' WITH CHANGES


4.072 +.002 5
5.884 +.003 -.003

SECTION A-A


12 REQ'D 11
TORQUE SCREWS TO 60±5 IN. LBS. 12 PLACES
⊕ .005 DIA
H4

PARTIAL SECTION C-C
2 PLACES

ITEM NO	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
17	3	MS-21209-F4-15	INSERT-SELF LOCKING
16	4	MS-171528	PIN SPRING
15	4	MS-21209-FS-15	INSERT-SELF LOCK
14	4	MS-35690-430	NUT-PLAIN, HEX
13	2	AN960C416	WASHER-PLAIN
12	2	1899968	PIN-ALIGNMENT
11	12	1010284-1	SCREW-FLAT HD, 100° HEX SOCKET
10	3	1899965	INSERT-OPTICS MOUNTING
9	1	1899964	PLATE-BACK-UP, R H REAR
8	1	1899963	L H REAR
7	1	1899962	R H FRONT
6	1	1899961	L H FRONT
5	1	1899960	PAD-IMU MOUNTING, R H REAR
4	1	1899959	L H REAR
3	1	1899958	R H FRONT
2	1	1899957	L H FRONT
1	1	1899981	STRUCTURAL ASS'Y-NAV. BASE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899950-021	1899950-021

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.005	+2°
- 1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN C Zynda DATE 6/17/63
CHECKED J Kern 2-22-63
APPROVAL J HANN 7-22-63
APPROVAL 8/7/63
NASA APPROVAL
MIT APPROVAL 7-4-63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRAME ASSEMBLY
NAVIGATION BASE (INSET)

CODE IDENT NO.
SIZE J
1899982
SCALE 1:1
SHEET

1899982 K

2/1899982

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327

UNLESS OTHERWISE SPECIFIED:
ALL CORNERS TO HAVE .005 TO .015 R OR CHAMFER.
SURFACE ROUGHNESS SHALL NOT EXCEED 16√

MUST BE FREE FROM BURRS.
SURFACES T,U,V & W MUST BE FLAT WITHIN .0001
SURFACE T,U,V,W MUST BE PARALLEL WITH SURFACE R WITHIN .0002.

1▷ INSERT MAY BE MACHINED OR LAPPED TO OBTAIN THE DIMENSIONAL & PARALLELISM REQUIREMENTS.

ALL DIMENSIONS MUST BE WITHIN SPECIFIED LIMITS AT A UNIFORM PART TEMPERATURE OF 68° ± 1° F.

2▷ THE SIZE & SPHERICITY OF THE 3 GAGE BALLS MUST BE WITHIN A .000010 TOLERANCE ZONE.

3▷ INSERT PINS 1/16 BELOW SURFACES "V" & "W" PRIOR TO FINISH MACHINING OF THESE SURFACES.

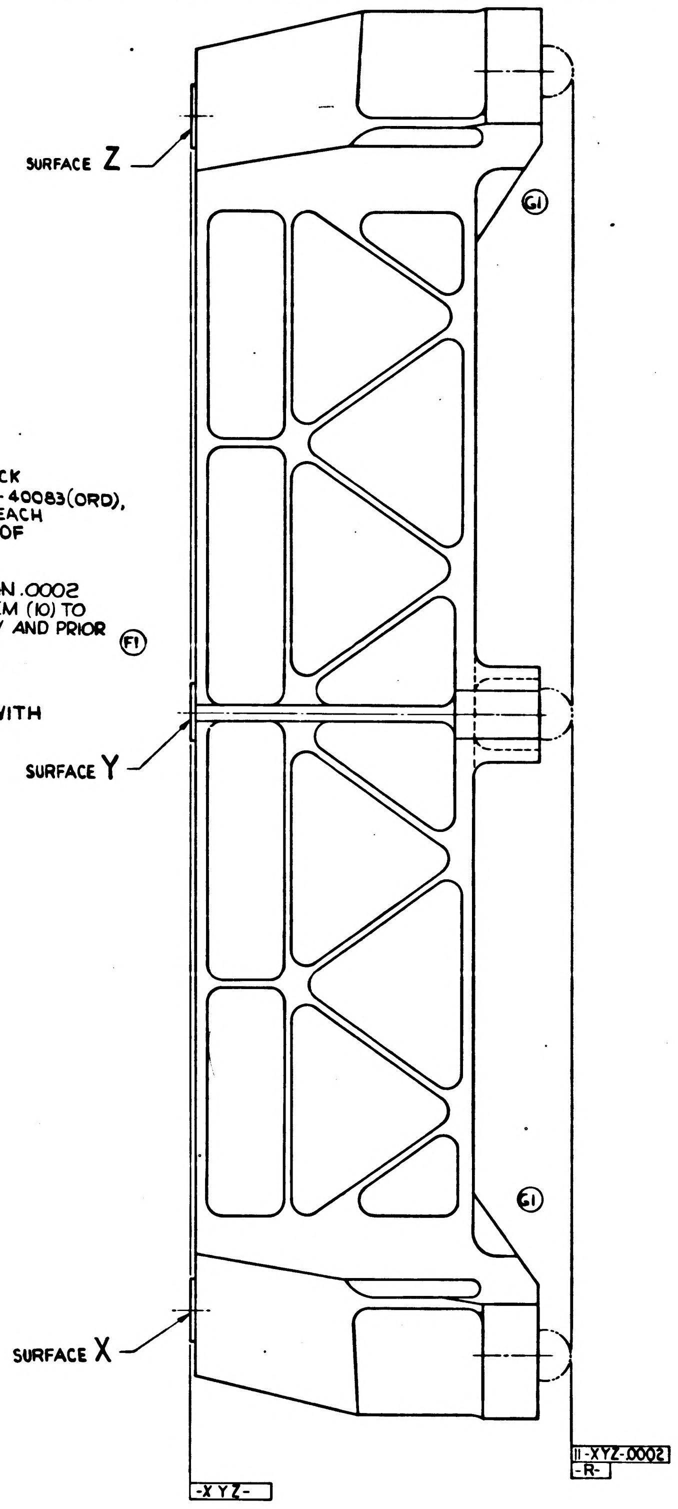
4▷ AFTER ADJUSTMENT OF DATUM -H- TO -S- TORQUE 1 EACH OF ITEM 14 (2 PLACES TO 85±5 IN.LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-. APPLY COMPOUND, MIL-S-40083(ORD), CLASS 30, TO THREADS OF ITEM 12 (2 PLACES). TORQUE 1 EACH ITEM 14 (2 PLACES) TO 60±5 IN-LBS. RECHECK ALIGNMENT OF DATUM -H- TO -S-

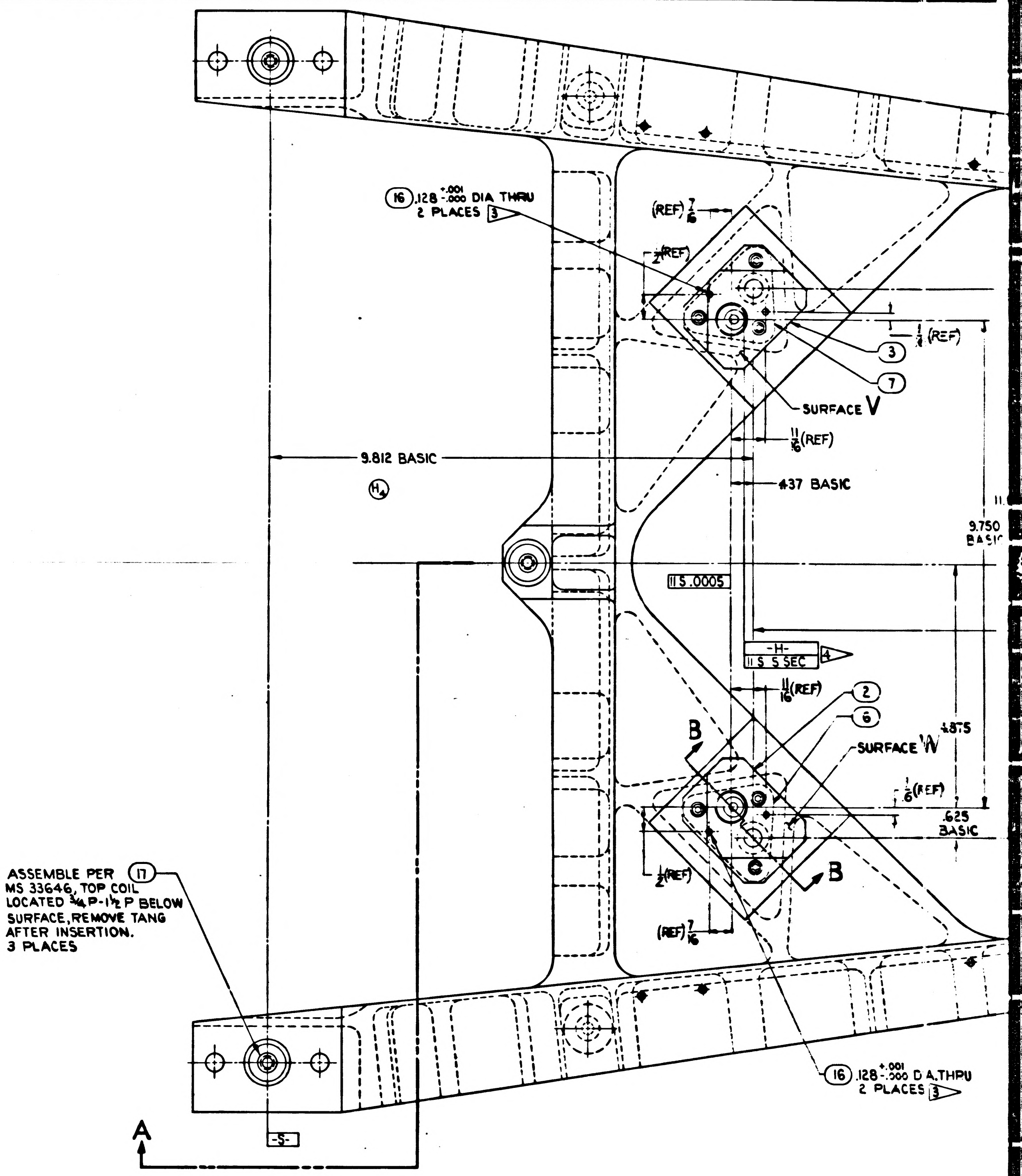
5▷ THE ESTABLISHED DIMENSION SHALL NOT VARY MORE THAN .0002 FROM SURFACE R TO ANY POINT ON SUFACES T, U, V, & W. ITEM (10) TO BE SUBJECTED TO 500 LBS. AXIAL PRELOAD AFTER ASSEMBLY AND PRIOR TO FINAL MACHINING OF SURFACES T,U,V,& W

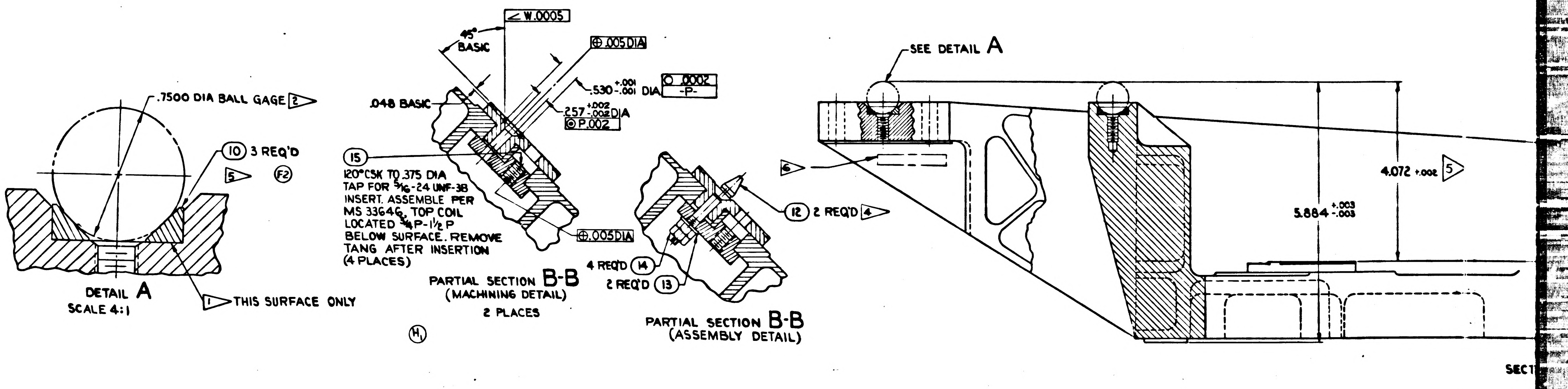
6▷ IDENTIFY USING DRAWING NO., REVISION LETTER, AND SERIAL NO. PER ND1002023.

Ⓙ PERFORM INTERFACE ALIGNMENT TEST IN ACCORDANCE WITH ATP-1899982

(F1)


SURFACE Z
(G1)
SURFACE Y
(G1)
SURFACE X
-XYZ-
// -XYZ- .0002
-R-


(16) .128 +.001 -.000 DIA THRU
2 PLACES 3▷
(REF) 7/16
1/2 (REF)
1/4 (REF)
(3)
(7)
SURFACE V
11/16 (REF)
9.812 BASIC
(H4)
.437 BASIC
9.750 BASIC
// S .0005
-H-
// S S SEC
4▷
11/16 (REF)
(2)
(6)
B
SURFACE W
.875
1/8 (REF)
.625 BASIC
1/2 (REF)
B
(REF) 7/16
ASSEMBLE PER (17) MS 33646, TOP COIL LOCATED 3/4 P-1 1/2 P BELOW SURFACE, REMOVE TANG AFTER INSERTION. 3 PLACES
(16) .128 +.001 -.000 DIA THRU
2 PLACES 3▷
A
-S-


.7500 DIA BALL GAGE 2▷
(10) 3 REQ'D
5▷
(F2)
1▷ THIS SURFACE ONLY
∠ W .0005
45° BASIC
⊕ .005 DIA
.530 +.001 -.001 DIA
○ .0002
-P-
.048 BASIC
.257 +.002 -.002 DIA
◎ P .002
(15)
120° CSK TO .375 DIA
TAP FOR 5/16-24 UNF-3B
INSERT. ASSEMBLE PER
MS 33646, TOP COIL
LOCATED 3/4 P-1 1/2 P
BELOW SURFACE. REMOVE
TANG AFTER INSERTION
(4 PLACES)
⊕ .005 DIA
(H1)
(12) 2 REQ'D 4▷
4 REQ'D (14)
2 REQ'D (13)
SEE DETAIL A
6▷
4.072 ±.002 5▷
5.884 +.003 -.003

DETAIL A
SCALE 4:1

PARTIAL SECTION B-B
(MACHINING DETAIL)
2 PLACES

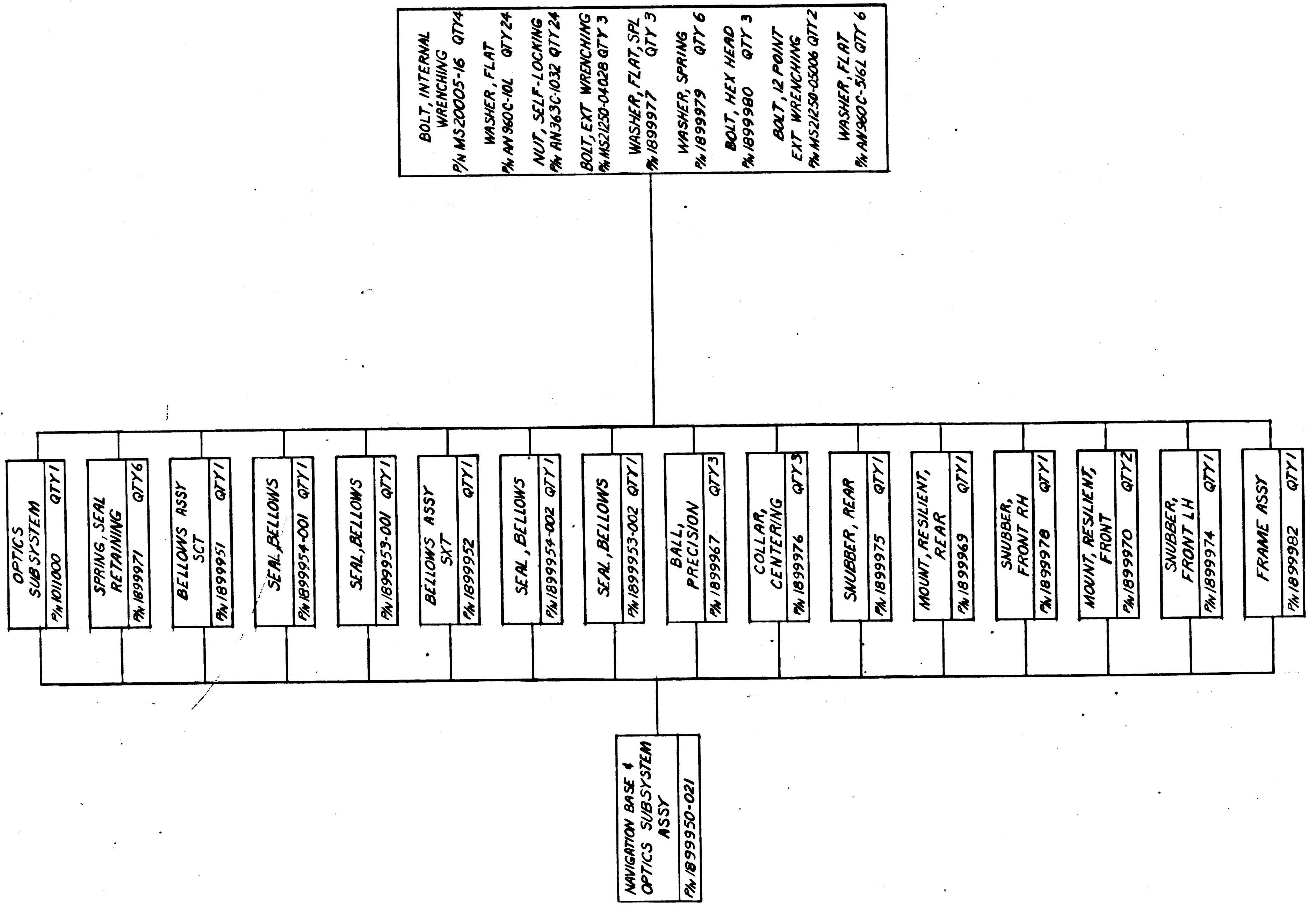
PARTIAL SECTION B-B
(ASSEMBLY DETAIL)

SECT

1/1899982

1899983 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
		INITIAL CLASS A RELEASE PER TDRR 02517		14 Aug 63	WR


BOLT, INTERNAL WRENCHING P/N MS20005-16 QTY4
WASHER, FLAT P/N AN960C-10L QTY24
NUT, SELF-LOCKING P/N AN363C-1032 QTY24
BOLT, EXT WRENCHING P/N MS21250-04028 QTY 3
WASHER, FLAT, SPL P/N 1899977 QTY 3
WASHER, SPRING P/N 1899979 QTY 6
BOLT, HEX HEAD P/N 1899980 QTY 3
BOLT, 12 POINT EXT WRENCHING P/N MS21250-05006 QTY 2
WASHER, FLAT P/N AN960C-516L QTY 6
OPTICS SUBSYSTEM P/N 1011000 QTY1
SPRING, SEAL RETAINING P/N 1899971 QTY6
BELLOWS ASSY SCT P/N 1899951 QTY1
SEAL, BELLOWS P/N 1899954-001 QTY1
SEAL, BELLOWS P/N 1899953-001 QTY1
BELLOWS ASSY SXT P/N 1899952 QTY1
SEAL, BELLOWS P/N 1899954-002 QTY1
SEAL, BELLOWS P/N 1899953-002 QTY1
BALL, PRECISION P/N 1899967 QTY3
COLLAR, CENTERING P/N 1899976 QTY3
SNUBBER, REAR P/N 1899975 QTY1
MOUNT, RESILIENT, REAR P/N 1899969 QTY1
SNUBBER, FRONT RH P/N 1899978 QTY1
MOUNT, RESILIENT, FRONT P/N 1899970 QTY2
SNUBBER, FRONT LH P/N 1899974 QTY1
FRAME ASSY P/N 1899982 QTY1
NAVIGATION BASE & OPTICS SUBSYSTEM ASSY P/N 1899950-021

MASTER

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. RENDALL DATE 2 AUG 63
CHECKED J.F. KERN 2 AUG 63
APPROVAL B. LIETZ 2 AUG 63
APPROVAL 5 AUG 63
NASA APPROVAL
MIT APPROVAL 14 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

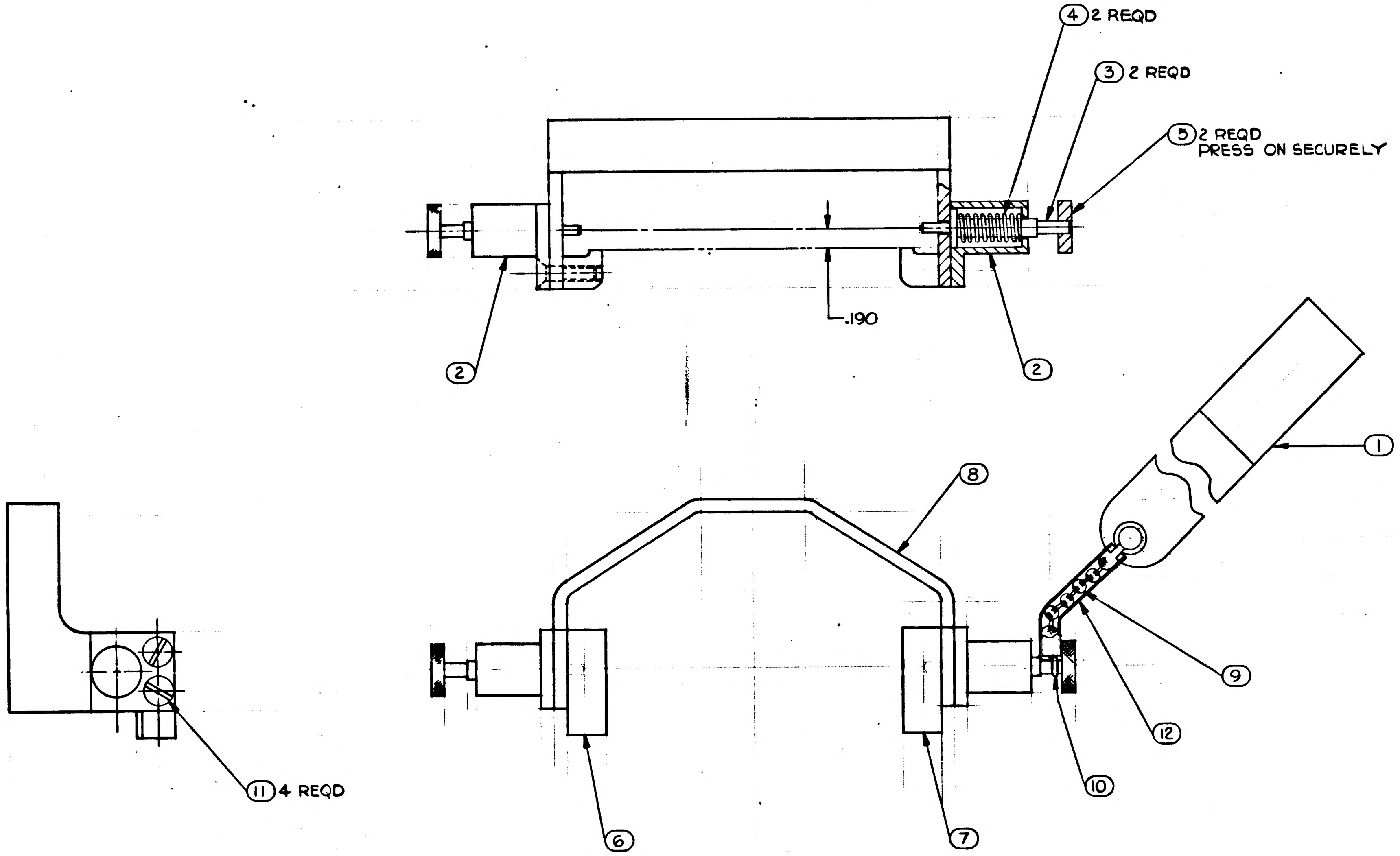
NAVIGATION BASE & OPTICS SUBSYSTEM
ASSEMBLY
FAMILY TREE DRAWING

CODE IDENT NO.
SIZE D
1899983
SCALE —
SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NO. PREFIXED BY 'ASSY' WITH APPLICABLE DASH NO. & REVISION LETTER PER ND 1002023 (ES-267).



FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 06086 DATE 2/4/64

			1		12	1015864-346	SLEEVING-ELECT. INSUL.
			4		11	MS35249-37	SCREW-FLAT HD
			1		10	1016294-001	COUPLING-BEAD CHAIN
			1		9	1016293-001	CHAIN-BEAD
			1		8	1899993	BRACKET-MOUNTING
			1		7	1899992	BLOCK-ALIGNMENT R.H.
			1		6	1899991	BLOCK-ALIGNMENT L.H.
			2		5	1899990	KNOB-SHAFT
			2		4	1899989	SPRING,HELICAL-COMPRESS CV
			2		3	1899988	SHAFT-SHOULDERED LOCK-CUT
			2		2	1899987	RETAINER-SHAFT
			1		1	1899986	STREAMER (USED ASSY)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +− −− DECIMALS +.005 −.005 ANGLES +− −−
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P.T. Wensing DATE 2 JAN 64
CHECKED 9 JAN 64
APPROVAL
APPROVAL 1-30-64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

REAR ISOLATOR
CLAMP ASSEMBLY

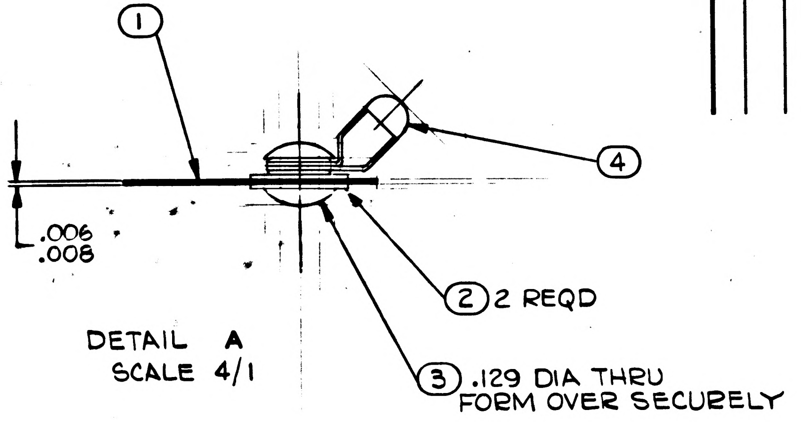
CODE IDENT NO. SIZE E 1899985
SCALE 2/1 SHEET 1 OF 1

1899985

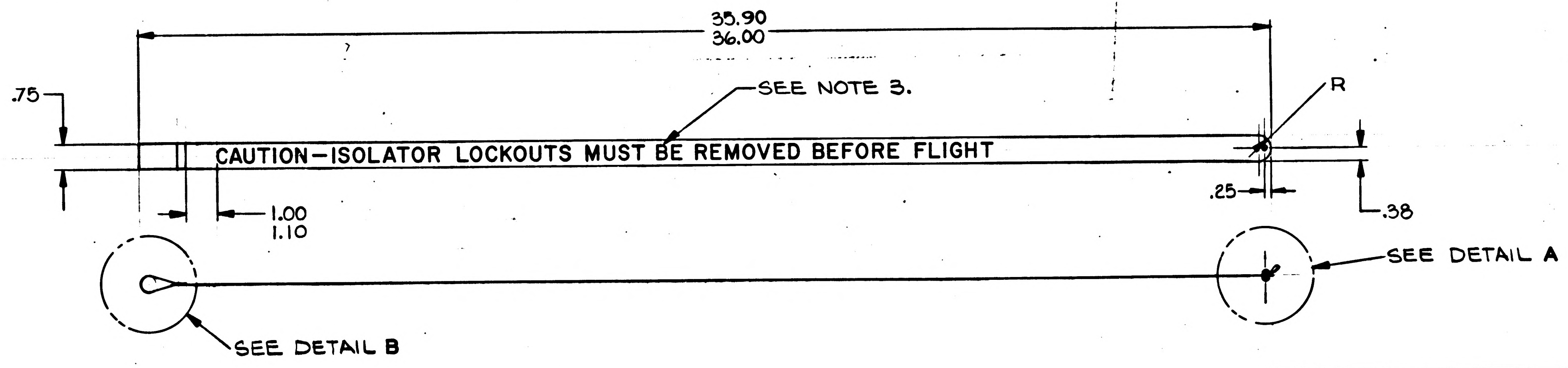
1899986 A

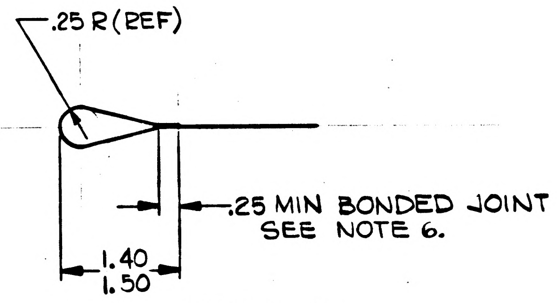
REVISIONS					
SYM	ZONE	DESCRIPTION TDRR 06086	CHG NO.	DATE	APPD.
A		UP-GRADED FOR CLASS A RELEASE		28 FEB 64	CJK

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: NYLON FILM PER MIL-P-17091, TYPE 1, COLOR RED. (ES-2727)
3. HOT STAMP CHARACTERS PER ND1002019, .50 HIGH, FUTURA DEMI BOLD, COLOR BLACK, CENTRALIZE AS SHOWN. (ES-2872).
4. ITEM ① MUST BE FREE FROM TEARS.
5. IDENTIFY USING DRAWING NO. & REVISION LETTER PER ND1002019 (ES-267).
6. BOND MUST MEET AXIAL PULL OF 30 LBS.


①
④
.006
.008
② 2 REQD
③ .129 DIA THRU
FORM OVER SECURELY

DETAIL A
SCALE 4/1


35.90
36.00
.75
SEE NOTE 3.
CAUTION—ISOLATOR LOCKOUTS MUST BE REMOVED BEFORE FLIGHT
R
.25
.38
1.00
1.10
SEE DETAIL A
SEE DETAIL B


.25 R (REF)
.25 MIN BONDED JOINT
SEE NOTE 6.
1.40
1.50

DETAIL B
SCALE FULL

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4	1	1016294-001	COUPLING-BEAD CHAIN
3	1	MS16535-114	RIVET-TUBULAR
2	2	AN960C4	WASHER-FLAT
1	1	1899986-1	STREAMER -SEE NOTE 2.

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899994-011	1899994-011
1899985-011	1899985-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+−	±.03	+2°
−−	±.005	−2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN H. Weigum DATE 30 DEC 63
CHECKED 9 JAN 64
APPROVAL E. J. Lembcke
APPROVAL W. Schmidt 1-30-64
NASA APPROVAL
MIT APPROVAL W. Coyle 4 FEB 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STREAMER
(INSEPARABLE ASSEMBLY)

CODE IDENT NO.
SIZE D
1899986
SCALE 1/2
SHEET 1 OF 1

1899986

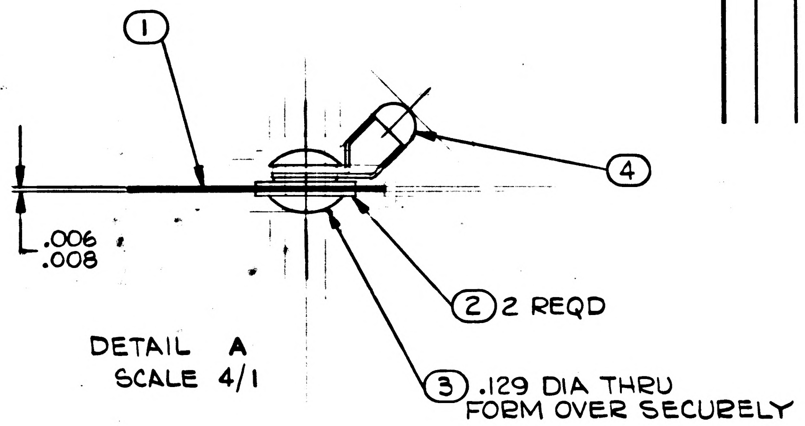
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

9866681

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: NYLON FILM PER MIL-P-17091, TYPE 1, COLOR RED. (ES-2727)
3. HOT STAMP CHARACTERS PER ND1002019, .50 HIGH, FUTURA DEMI BOLD, COLOR BLACK, CENTRALIZE AS SHOWN. (ES-2872).
4. ITEM ① MUST BE FREE FROM TEARS.
5. IDENTIFY USING DRAWING NO. & REVISION LETTER PER ND1002023 (ES-267).
6. BOND MUST MEET AXIAL PULL OF 30 LBS.

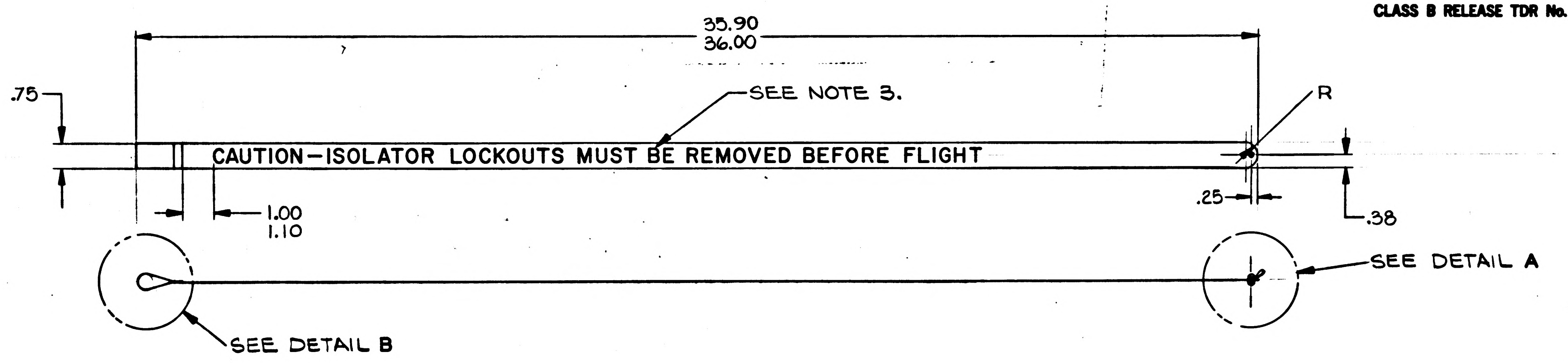


①
④
.006
.008
② 2 REQD
③ .129 DIA THRU
FORM OVER SECURELY

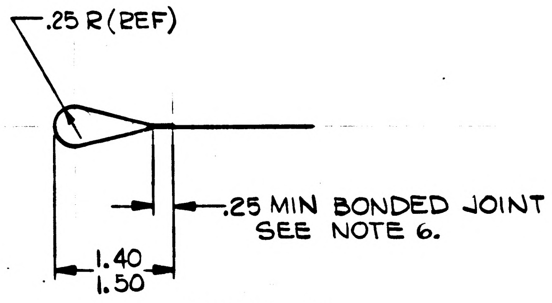
DETAIL A
SCALE 4/1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06096 **DATE** [illegible]



35.90
36.00
.75
SEE NOTE 3.
CAUTION—ISOLATOR LOCKOUTS MUST BE REMOVED BEFORE FLIGHT
R
.25
.38
1.00
1.10
SEE DETAIL A
SEE DETAIL B



.25 R (REF)
.25 MIN BONDED JOINT
SEE NOTE 6.
1.40
1.50

DETAIL B
SCALE FULL

ITEM NO.	NO. REQD	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4	1	1016294-001	COUPLING-BEAD CHAIN
3	1	MS16535-114	RIVET-TUBULAR
2	2	AN960C4	WASHER-FLAT
1	1	1899986-1	STREAMER -SEE NOTE 2.

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1899994-011	1899994-011
1899985-011	1899985-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+-	±.03	+2°
--	±.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. Weigum DATE 30 DEC 63
CHECKED Peterson 9 JAN 64
APPROVAL E. J. Lenkeit
APPROVAL W. Schmidt 1-30-64
NASA APPROVAL
MIT APPROVAL W. Cooper 4 Feb 64

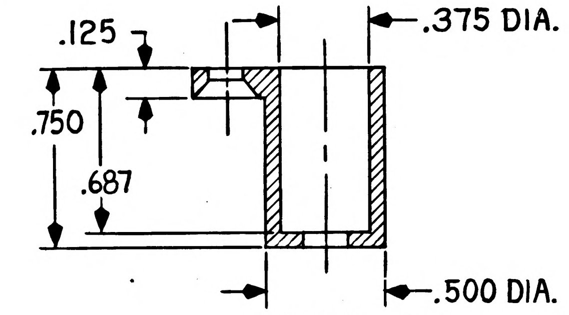
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

STREAMER
(INSEPARABLE ASSEMBLY)

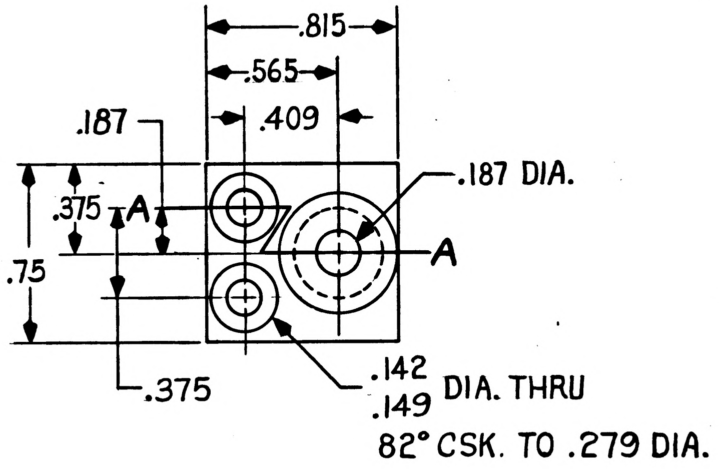
CODE IDENT NO. SIZE D 1899986
SCALE 1/2 SHEET 1 OF 1

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-763, CLASS 303 OR 303 Se, COND. A, CF. (ES-380).
3. FINISH: MIL-F-14072 (SIG C) FINISH E-300, PASSIVATE. (ES-585)
4. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER ND-1002023. (ES-267).
5. MUST BE FREE FROM BURRS.
6. UNLESS OTHERWISE SPECIFIED:
   SURFACE ROUGHNESS NOT TO EXCEED $\sqrt[125]{}$
   CORNERS TO BE .005 TO .015 R OR CHAMFER.



SECTION A-A



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 1/14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — − — DECIMALS ∓.02 ∓.005 ANGLES +2° −2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN D. Dobbert DATE 30DEC63 CHECKED 10 JAN 64 APPROVAL J. Lemkuhl APPROVAL 1-30-64	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
MATERIAL SEE NOTE 2	NASA APPROVAL	CODE IDENT NO.	SIZE C	1899987
CONTRACT NAS 9-497	MIT APPROVAL 4 Feb 64	SCALE 2:1	SHEET 1 OF 1

RETAINER-SHAFT

NEXT ASSY	USED ON
1899985-011	1899985-011
APPLICATION	

1899987

MIL 1077C—P

8866681

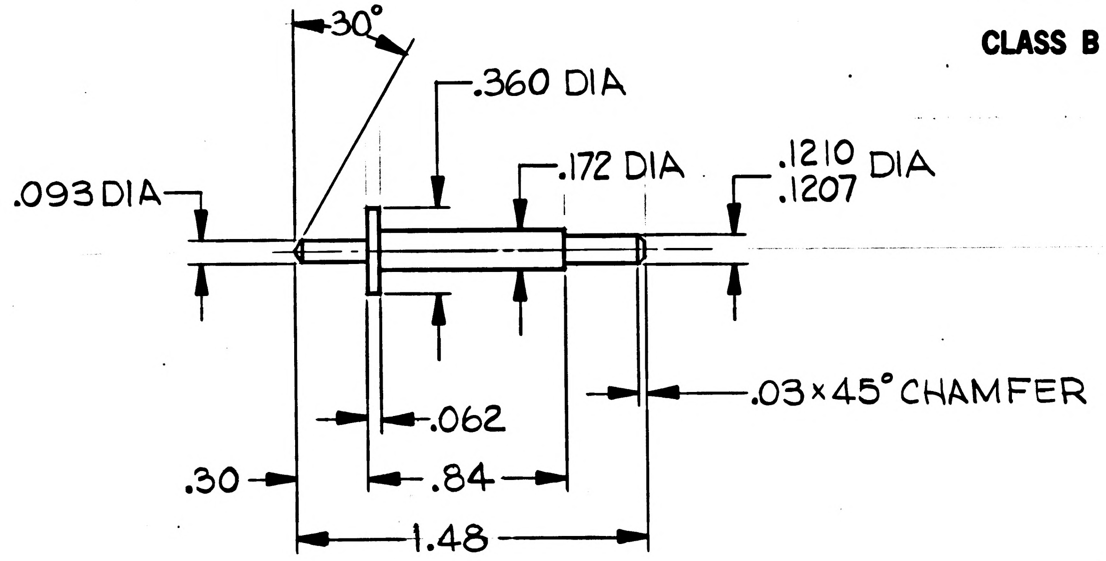
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

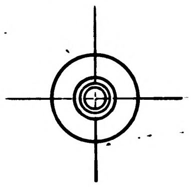
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-763, CLASS 303 OR 303Se, COND A, CF. (ES-380).
3. FINISH: MIL-F-14072 (SIG C) FINISH E-300 PASSIVATE (ES-585).
4. UNLESS OTHERWISE SPECIFIED:
   SURFACE ROUGHNESS NOT TO EXCEED 125/.
   CORNERS TO BE .005 TO .015 R OR CHAMFER.
5. MUST BE FREE FROM BURRS.
6. IDENTIFY USING DRAWING NO. & REVISION LETTER PER ND-1002023. (ES-267).

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 4Feb64





1899985-011	1899985-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +- -- DECIMALS ±.02 ±.005 ANGLES +2° -2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN P.T. Weigum DATE 30 DEC 63 CHECKED 9 JAN 64 APPROVAL E. J. Lemkuhl APPROVAL 1-30-64	MANNED SPACECRAFT CENTER HOUSTON, TEXAS SHAFT, SHOULDERED-LOCK-OUT
NEXT ASSY	USED ON	MATERIAL SEE NOTE 2.	NASA APPROVAL	CODE IDENT NO. SIZE C 1899988
APPLICATION		CONTRACT NAS9-497	MIT APPROVAL 4Feb64	SCALE 2/1 SHEET 1 OF 1

MIL 1077C-P

6866681

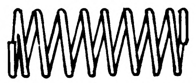
REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-W-423, COMP. FS 302 OR FS 304, COND. B, SPRING TEMP. (ES-376).
3. FINISH: MIL-F-14072 (SIG C) FINISH E-300, PASSIVATE. (ES-585).
4. MUST BE FREE FROM BURRS AND SHARP EDGES.
5. ENDS TO BE CLOSED.
6. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER ND-1002023 (ES-267).

WIRE DIAMETER	.026
I.D.	.228 .218
FREE LENGTH	.75
ACTIVE COILS	7
TOTAL COILS	9
MIN. RATE (LBS./IN. REF.)	5
MAX. SOLID HEIGHT	.26
WIND RIGHT HAND	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 4 Feb 64

1899985-011	1899985-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.02	+ —
- —	∓.005	- —

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN D. Dobbert DATE 30 DEC63
CHECKED 10 JAN64
APPROVAL E. J. Lembril
APPROVAL 1-30-64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SPRING,
HELICAL, COMPRESSION

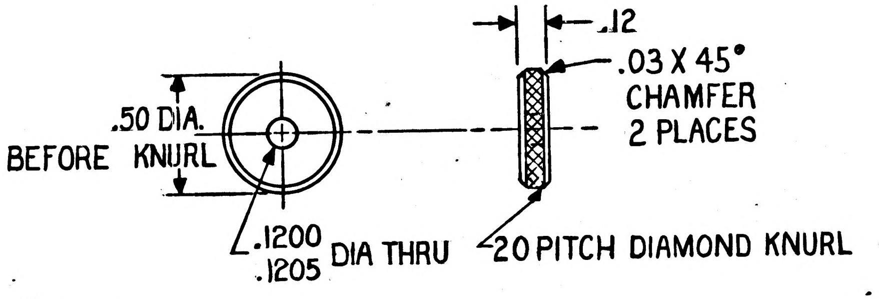
CODE IDENT NO.
SIZE C
1899989
SCALE 2:1
SHEET 1 OF 1

MIL 1077C-P

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-763, CLASS 303 OR 303 Se, COND. A, CF. (ES-380).
3. FINISH: MIL-F-14072 (SIG C) FINISH E-300, PASSIVATE. (ES-585)
4. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER ND-1002023 (ES-267).
5. MUST BE FREE FROM BURRS.
6. UNLESS OTHERWISE SPECIFIED:
   SURFACE ROUGHNESS MUST NOT EXCEED 125√
   CORNERS TO BE .005 TO .015 R OR CHAMFER.

REVISIONS

SYM	DESCRIPTION	CHG NO.	DATE	APPD.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 2/4/64

1899985-011	1899985-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ —
— —	—.02	— —

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN D. Dobbert DATE 27 DEC 63
CHECKED 10 JAN 64
APPROVAL E. J. Lemkuil
APPROVAL 1-30-64
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

KNOB - SHAFT

CODE IDENT NO. SIZE B 1899990
SCALE 2:1 SHEET 1 OF 1

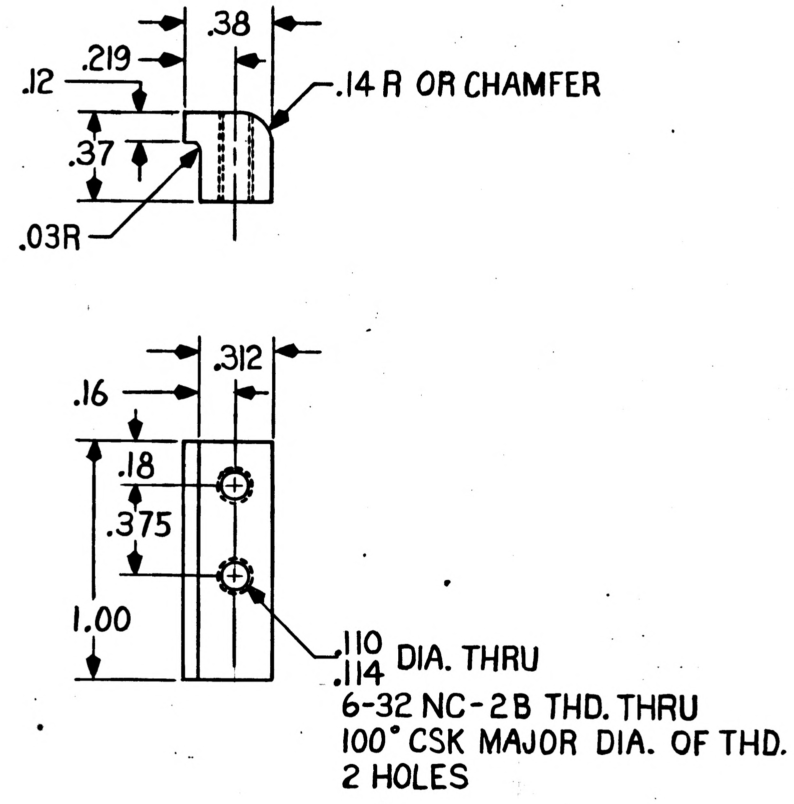
MIL 10778-P

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-763, CLASS 303 OR 303 Se COND. A, CF. (ES-380).
3. FINISH: MIL-F-14072 (SIG C) FINISH E-300, PASSIVATE. (ES-585).
4. MUST BE FREE FROM BURRS.
5. UNLESS OTHERWISE SPECIFIED:
   SURFACE ROUGHNESS MUST NOT EXCEED 125√.
   CORNERS TO BE .005 TO .015 R OR CHAMFER.
6. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER ND-1002019 (ES-267).

REVISIONS TDRR 06086

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		UP-GRADED FOR CLASS A RELEASE 06741		28 FEB 64	CJK



1899985-011	1899985-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	∓.02	+
−	∓.005	−

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN D. Dobbert DATE 7 JAN 64
CHECKED Petersen 10 JAN 64
APPROVAL E. J. Lemkuil
APPROVAL W. Schmidt 1-30-64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BLOCK-ALIGNMENT
R. H.

CODE IDENT NO.
SIZE C
1899991
SCALE 2:1
SHEET 1 OF 1

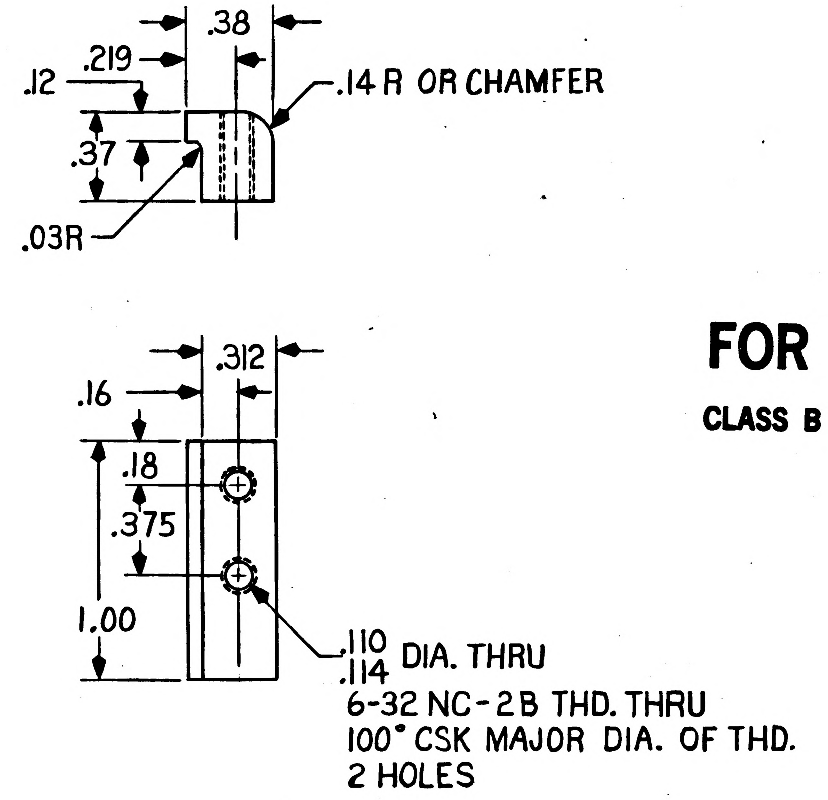
MIL 1077C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-763, CLASS 303 OR 303 Se COND. A, CF. (ES-380).
3. FINISH: MIL-F-14072 (SIG C) FINISH E-300, PASSIVATE. (ES-585).
4. MUST BE FREE FROM BURRS.
5. UNLESS OTHERWISE SPECIFIED:
   SURFACE ROUGHNESS MUST NOT EXCEED $\overset{125}{\checkmark}$.
   CORNERS TO BE .005 TO .015 R OR CHAMFER.
6. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER ND-1002023. (ES-267).

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 1 Feb 64

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
		FRACTIONS + − DECIMALS ∓.02 ∓.005 ANGLES + −	ACSP PN		
			DRAWN D. Dobbert DATE 2 JAN 64	BLOCK-ALIGNMENT R. H.	
			CHECKED Peterman 10 JAN 64		
			APPROVAL E. J. Lemkuil		
		DO NOT SCALE THIS DRAWING	APPROVAL W Schmidt 1-30-64		
1899985-011	1899985-011	MATERIAL SEE NOTE 2	NASA APPROVAL	CODE IDENT NO.	SIZE C 1899991
NEXT ASSY	USED ON		MIT APPROVAL W Cuff 4 Feb 64		
APPLICATION		CONTRACT NAS 9-497		SCALE 2:1	SHEET 1 OF 1

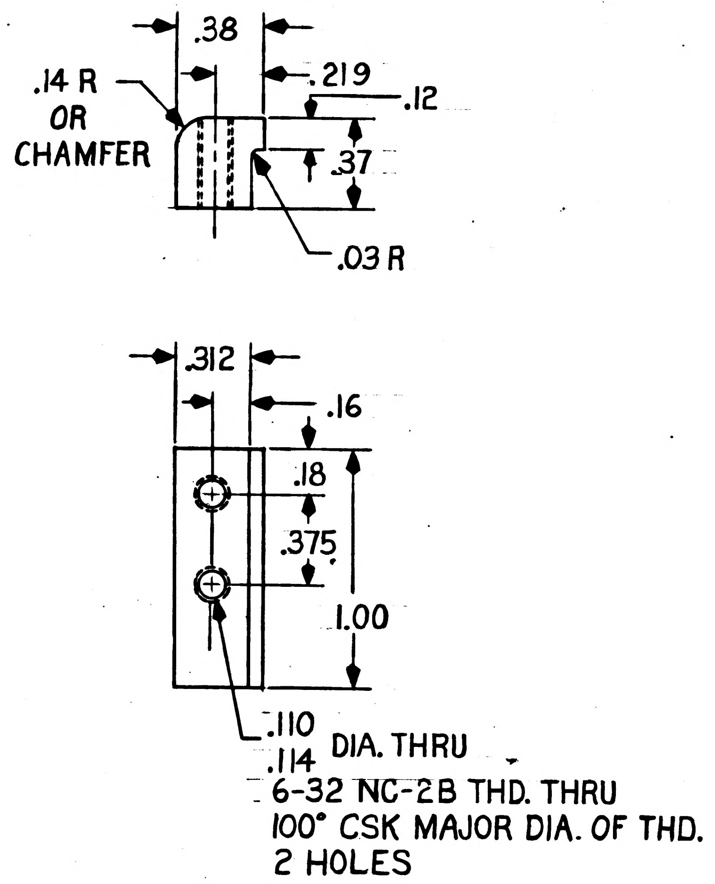
MIL 1077C—P

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-763, CLASS 303 OR 303 Se, COND. A, CF. (ES-380).
3. FINISH: MIL-F-14072 (SIG. C) FINISH E-300, PASSIVATE. (ES-585).
4. MUST BE FREE FROM BURRS.
5. UNLESS OTHERWISE SPECIFIED:
   SURFACE ROUGHNESS MUST NOT EXCEED $\sqrt{}^{125}$.
   CORNERS TO BE .005 TO .015 R OR CHAMFER.
6. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER ND-1002019. (ES-267).

REVISIONS Ⓜ

SYM	ZONE	DESCRIPTION TDRR06086	CHG NO.	DATE	APPD.
A		UP-GRADED FOR CLASS A RELEASE 06741		28 FEB 64	CJK



1899985-011	1899985-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	∓.02	+ —
— —	∓.005	— —

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN D. Doffert DATE 31 DEC 63
CHECKED 10 JAN 64
APPROVAL E. J. Lemkuhl
APPROVAL 1-30-64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BLOCK-ALIGNMENT
L. H.

CODE IDENT NO.
SIZE C
1899992
SCALE 2:1
SHEET 1 OF 1

MIL 1077C—P

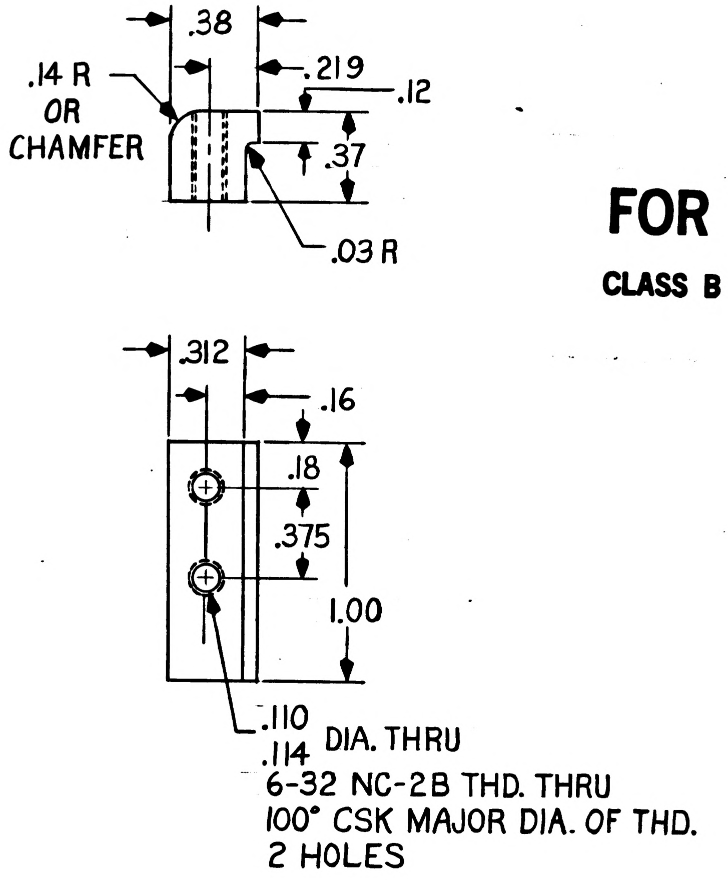
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1899992

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-763, CLASS 303 OR 303 Se, COND. A, CF. (ES-380).
3. FINISH: MIL-F-14072 (SIG. C) FINISH E-300, PASSIVATE. (ES-585).
4. MUST BE FREE FROM BURRS.
5. UNLESS OTHERWISE SPECIFIED:
   SURFACE ROUGHNESS MUST NOT EXCEED 125/✓.
   CORNERS TO BE .005 TO .015 R OR CHAMFER.
6. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER ND-1002023. (ES-267).

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 2/4/64

NEXT ASSY	USED ON
1899985-011	1899985-011
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± —	∓.02	± —
— —	∓.005	— —

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN D. Dobbert DATE 31 DEC 63
CHECKED 10 JAN 64
APPROVAL E. J. Lemkuhl
APPROVAL 1-30-64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BLOCK-ALIGNMENT
L. H.

CODE IDENT NO.
SIZE C
1899992
SCALE 2:1
SHEET 1 OF 1

MIL 1077C-P

1899993

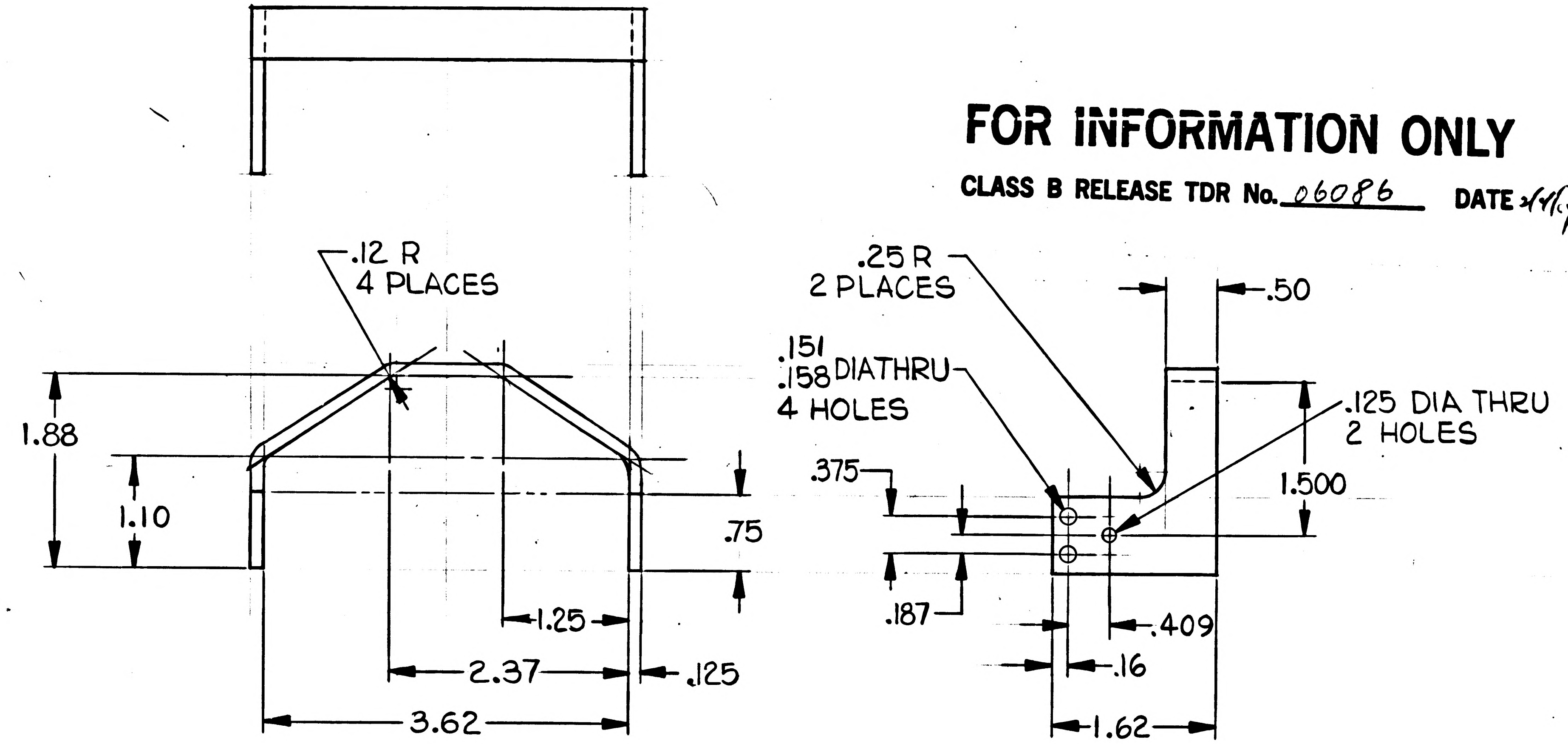
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: SST PER QQ-S-766, CLASS 302 OR 304 COND. A. (ES-376).
3. FINISH: MIL-F-14072 (SIG C) FINISH E-300 PASSIVATE (ES-585).
4. IDENTIFY USING DRAWING NO. & REVISION LETTER PER ND-1002023 (ES-267).
5. MUST BE FREE FROM BURRS & SHARP EDGES.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 2/4/64


.12 R
4 PLACES
1.88
1.10
.75
1.25
2.37
.125
3.62
.25 R
2 PLACES
.151
.158 DIA THRU
4 HOLES
.375
.187
.50
.125 DIA THRU
2 HOLES
1.500
.409
.16
1.62

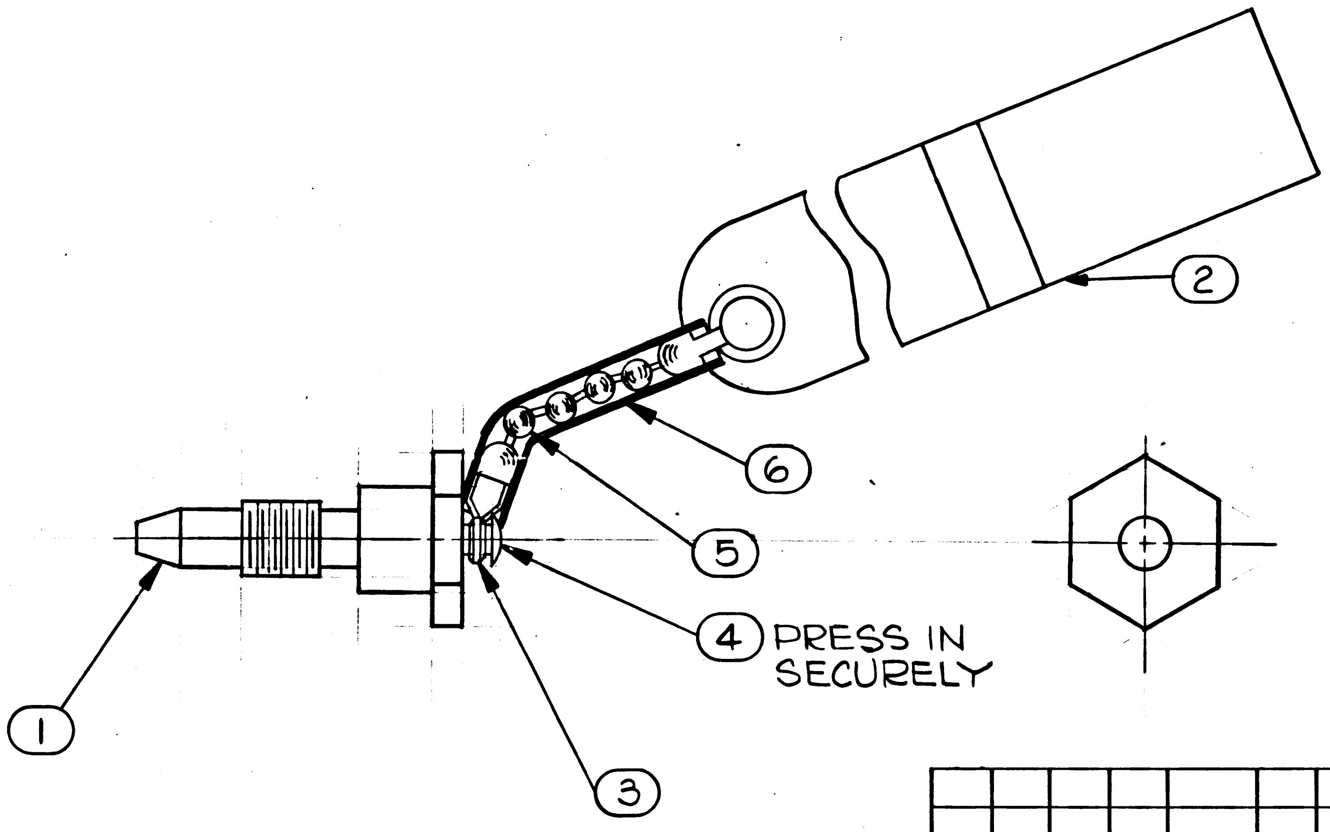
1899985-011	189985-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +— —— DECIMALS ±.02 ±.005 ANGLES +— —— DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN P T Newins DATE 27 DEC 63 CHECKED Petersen 9 JAN 64 APPROVAL E. J. Lemkuil APPROVAL 1-30-64	MANNED SPACECRAFT CENTER HOUSTON, TEXAS BRACKET-MOUNTING
NEXT ASSY	USED ON	MATERIAL SEE NOTE 2.	NASA APPROVAL	CODE IDENT NO. SIZE C 1899993
APPLICATION		CONTRACT NAS9-497	MIT APPROVAL 4-2-64	SCALE FULL SHEET 1 OF 1

MIL 1077C—P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NO. PREFIXED BY "ASSY" WITH APPLICABLE DASH NO. & REVISION LETTER PER ND1002023 (ES-267).



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 2/4/64

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1		6	1015864-346	SLEEVING-INSUL. ELECT.
			1		5	1016293-001	CHAIN-BEAD
			1		4	MS16535-116	RIVET
			1		3	1016294-001	COUPLING-BEAD CHAIN
			1		2	1899986	STREAMER (INSEP ASSY)
			1		1	1899995	PIN, SHOULDER, HEADED-LOCKING
			011				

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1899999	1899999	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P.T. Weigimz DATE 2 JAN 64
CHECKED Pitman 9 JAN 64
APPROVAL E. J. Lemkuhl
APPROVAL A Schmidt 1-30-64
NASA APPROVAL
MIT APPROVAL W Kupfer 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FRONT ISOLATOR
LOCKOUT PIN ASSEMBLY

CODE IDENT NO.
SIZE C
1899994
SCALE 2/1
SHEET 1 OF 1

MIL 1078C—P

6666681

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. IDENTIFY USING DRAWING NUMBER PREFIXED BY "ASSY" WITH APPLICABLE DASH NUMBER AND REVISION LETTER PER MIL-STD-130 (ES 267)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06086 **DATE** 2/4/64

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2			1899994	FRONT ISOLATOR LOCKOUT PIN ASSY
			1			1899985	REAR ISOLATOR CLAMP ASSY
			011				

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. KARLING DATE 21 JAN 64
CHECKED 22 JAN 64
APPROVAL E. Lenkeit
APPROVAL 1-30-64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

ISOLATOR LOCKOUT SET
(NAVIGATION BASE)

CODE IDENT NO.
SIZE C
1899999
SCALE —
SHEET 1 OF 1

MIL 1078C—P

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	-	CHANGE IN ACCORDANCE WITH MXC 187492		27 JUN 63	
B		CHANGE IN ACCORDANCE WITH MXC 187685.	MXC 187685	18 JUL 63	AXD.
C	—	CHANGE IN ACCORDANCE WITH MXC 190874 PER TDRR 04703	—	29 OCT 63 14 NOV 63	WSM

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01666 **DATE** 19 Jun 63

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			4			AN535-0-4	SCREW, DRIVE, ROUND HEAD
			1			1900704	NAMEPLATE, APOLLO G&N
			X			1900270	INSTALLATION DRAWING
			1			1900265	CABINET, ELECT EQUIP ASSY
			1			1900350-021	FAN, CENTRIFUGAL, ASSEMBLY
			1			1900047	OSCILLOGRAPH
			1			1900046	OSCILLOGRAPH CONTROL
			1			1900164	CONTROL, ELECT PEN, OSCILLOGRAPH
			1			1900045	OSCILLOGRAPH AMPLIFIER
			1			1900044	OSCILLOGRAPH AMPLIFIER
			1			1900039	INDICATOR, COUNTER, REMOTE
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ —— + —— + ——
– —— – —— – ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiel DATE 6 JUN 63
CHECKED Mal Burston 6 JUN 63
APPROVAL G. STODDARD 7 JUNE 63
APPROVAL L Gediman June 17, 1963
NASA APPROVAL Jack Barnes
MIT APPROVAL 19 Jun 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE ASSEMBLY

CODE IDENT NO.
SIZE C
1900000
SCALE —
SHEET 1 OF 1

MIL 1078C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		CHANGE IN ACCORDANCE WITH MXC 187492		27 JUN 63	d/B.V d/E78
B		CHANGE IN ACCORDANCE WITH MXC 187685.	MXC 187685	18 JUL 63	AXD. WS
C	—	CHANGE IN ACCORDANCE WITH MXC 190874 PER TDRR 04703	—	29 OCT 63 NOV 63	WSM
D		REPLACED WITH CHANGE BY REV. "E" PER MXC 192538 PER TDRR 05660		11 DEC. 63 1/7/64	A.M. E78 WK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01666 **DATE** 19 Jun 63

Ⓓ REPLACED WITH CHANGE BY REV "E"

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4			AN535-0-4	SCREW, DRIVE, ROUND HEAD
1			1900704	NAMEPLATE, APOLLO G&N
X			1900270	INSTALLATION DRAWING
1			1900265	CABINET, ELECT EQUIP ASSY
1			1900350-021	FAN, CENTRIFUGAL, ASSEMBLY
1			1900047	OSCILLOGRAPH
1			1900046	OSCILLOGRAPH CONTROL
1			1900164	CONTROL, ELECT PEN, OSCILLOGRAPH
1			1900045	OSCILLOGRAPH AMPLIFIER
1			1900044	OSCILLOGRAPH AMPLIFIER
1			1900039	INDICATOR, COUNTER, REMOTE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
- — - — - —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiele DATE 6 JUN 63
CHECKED Malikowski 6 Jun 63
APPROVAL G. Stoddard 7 June 63
APPROVAL L Gelman June 17, 1963
NASA APPROVAL Jack Barnes
MIT APPROVAL 19 Jun 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE
ASSEMBLY

CODE IDENT NO.
SIZE C
1900000
SCALE —
SHEET 1 OF 1

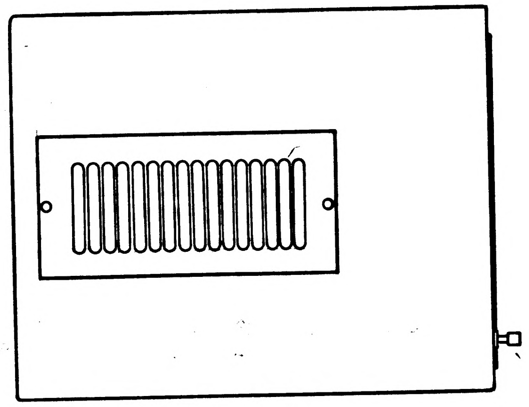
MIL 1078C—P

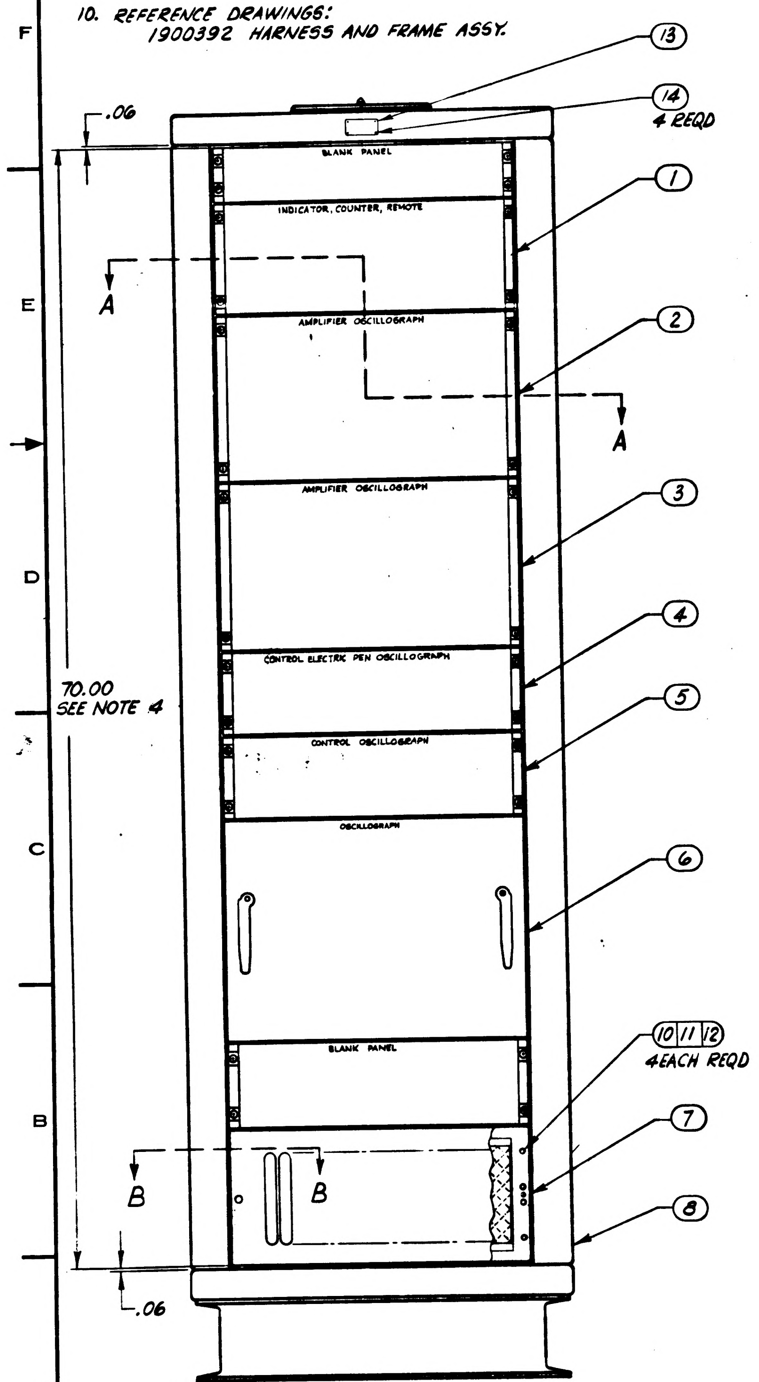
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

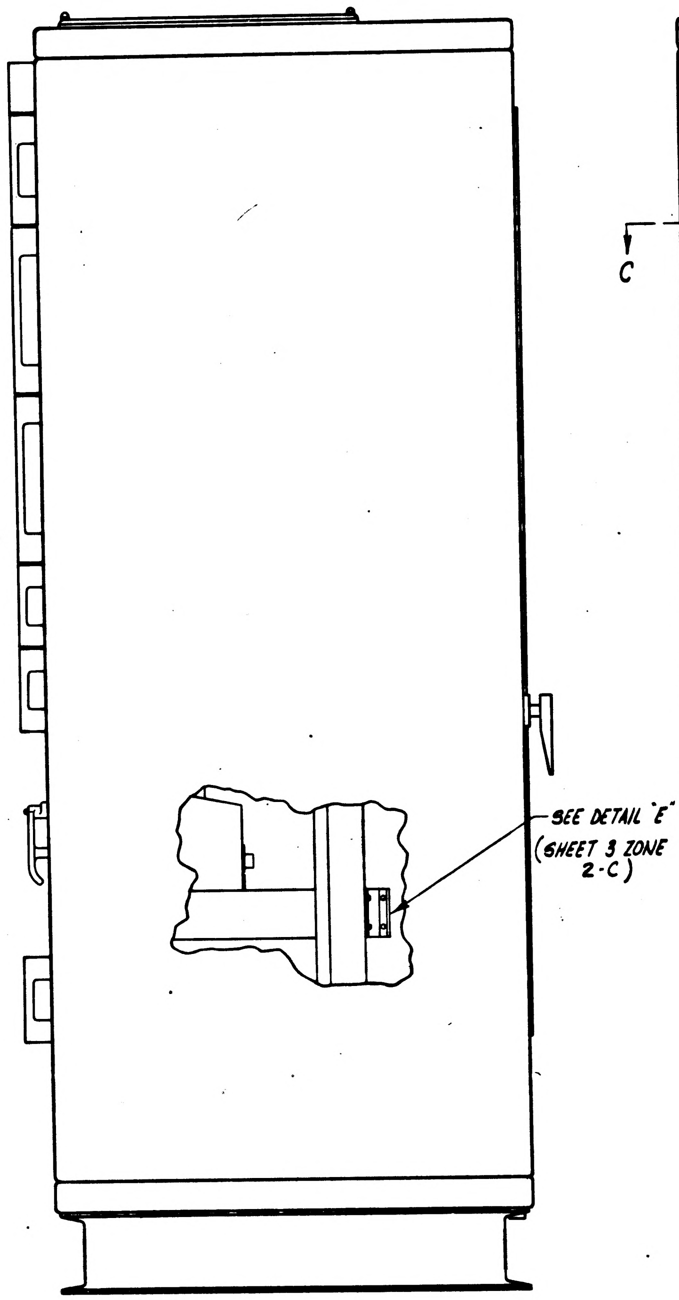
NOTES:

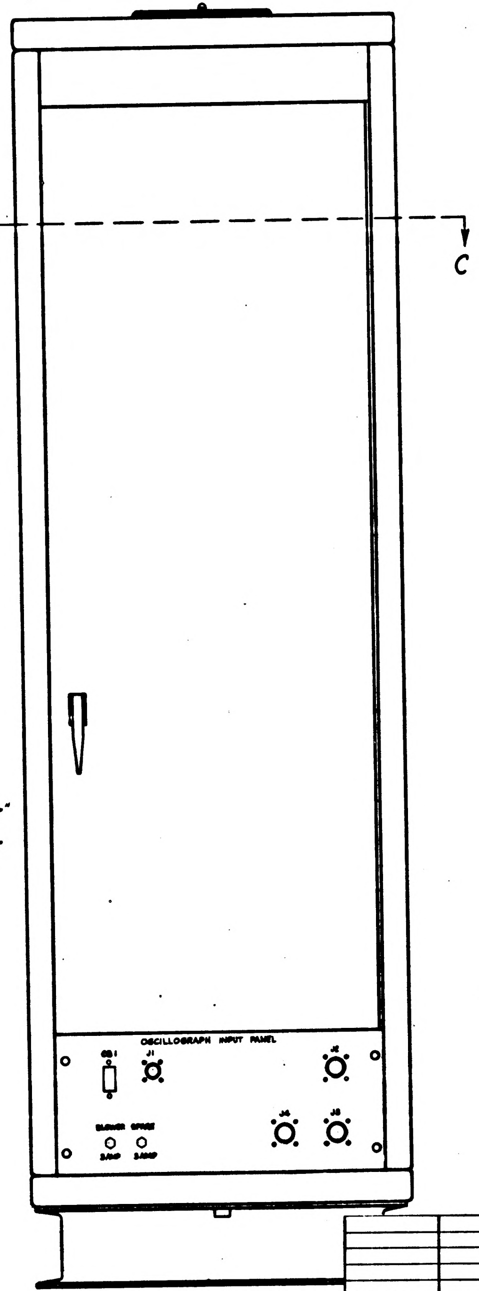
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267).
3. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS: #10-32 , 37-40 IN LBS.
4. SPACING BETWEEN FRONT PANELS IS TO BE BALANCED THRU THIS DIMENSION. A .030 MIN. SPACE IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
6. APPLY ITEM ⑮ TO SURFACE "A".
7. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
8. UNLESS CONSOLE BASE IS FIRMLY ATTACHED TO A RIGID FLOOR, OVERTURN COULD RESULT WHEN 2 OF THE DRAWERS ARE EXTENDED, SEE ITEM ⑯.
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS PROVIDED AT 2 PLACES AS SHOWN WITH THE OPTION OF FORWARD OR BACKWARD HANGING.
10. REFERENCE DRAWINGS:
    1900392 HARNESS AND FRAME ASSY.

SHEET NO.	SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
	E		REPLACES REV. D WITH CHANGE PER MXC 192538 REVISED PER TDR 05660		11 DEC 63	




.06
⑬
⑭
4 REQD
BLANK PANEL
INDICATOR, COUNTER, REMOTE
①
A
A
AMPLIFIER OSCILLOGRAPH
②
AMPLIFIER OSCILLOGRAPH
③
④
CONTROL ELECTRIC PEN OSCILLOGRAPH
⑤
CONTROL OSCILLOGRAPH
70.00
SEE NOTE 4
OSCILLOGRAPH
⑥
BLANK PANEL
⑩⑪⑫
4 EACH REQD
⑦
B
B
⑧
.06


SEE DETAIL "E"
(SHEET 3 ZONE 2-C)


C
C
OSCILLOGRAPH INPUT PANEL
CB1
J1
J2
J4
J8
BLOWER
SPARE
3 AMP
3 AMP

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01666 DATE 19 Jan 64

E	E	E
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

Ⓔ REPLACES REV D WITH CHANGE

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 8				X		16	1900270	INSTALLATION DRAWING OIA
SEE NOTE 6				AR		15	MIL-I-8660	DOW CORNING #4 LUB GREASE
				4		14	1897109-004	SCREW, DRIVE, ROUND HEAD
				1		13	1900705	IDENTIFICATION PLATE, SEE DRAWING
								TO SELECT APPROPRIATE DASH NO.
				52		12	MS-35338-81	WASHER LOCK #10
				52		11	AN-960-C10L	WASHER FLAT #10 (1897006-[illegible])
SEE NOTE 5				52		10	1006783-44	SCREW BUTTON HD. HEX. SOCKET
				4		9	1900934	SPACER, BAR
				1		8	1900265-011	CABINET, ELECT. EQUIP. ASSY
				1		7	1015824-2	FAN ASSEMBLY, CENTRIFUGAL
				1		6	1900047-011	OSCILLOGRAPH
				1		5	1900046-011	CONTROL OSCILLOGRAPH ASSY
				1		4	1900164-011	CONTROL, ELECT PEN OSCILLOGRAPH ASSY
				1		3	1900045-011	AMPLIFIER OSCILLOGRAPH ASSY
				1		2	1900044-011	AMPLIFIER OSCILLOGRAPH ASSY
				1		1	1900039-011	INDICATOR, COUNTER, REMOTE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

1900000 E

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — ±.005 + —
- — ±.02 - —
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN John A. Kosidowski DATE 26 Oct 63
CHECKED A. Udovich 5 NOV 63
APPROVAL 6 Nov 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

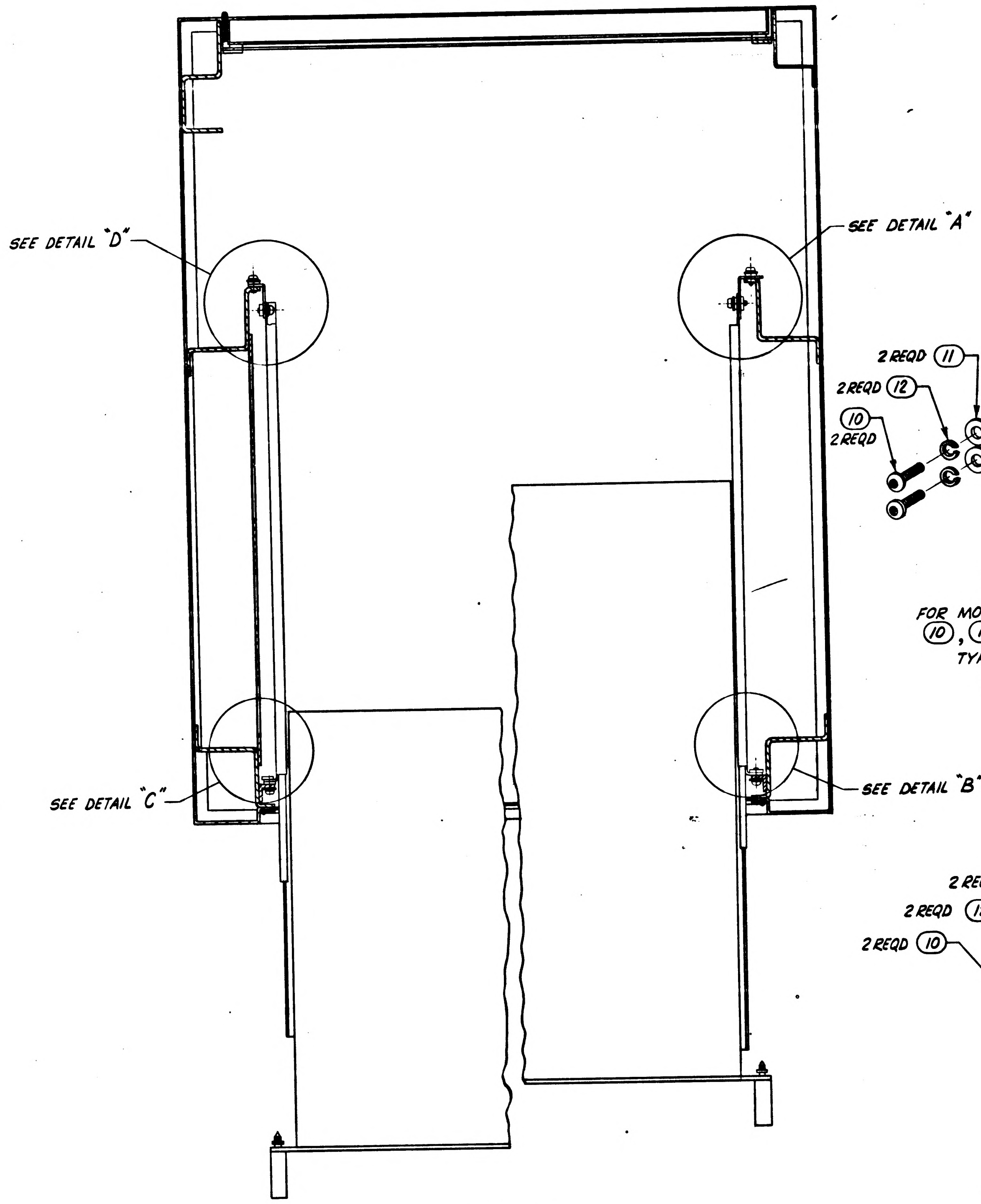
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE
ASSEMBLY

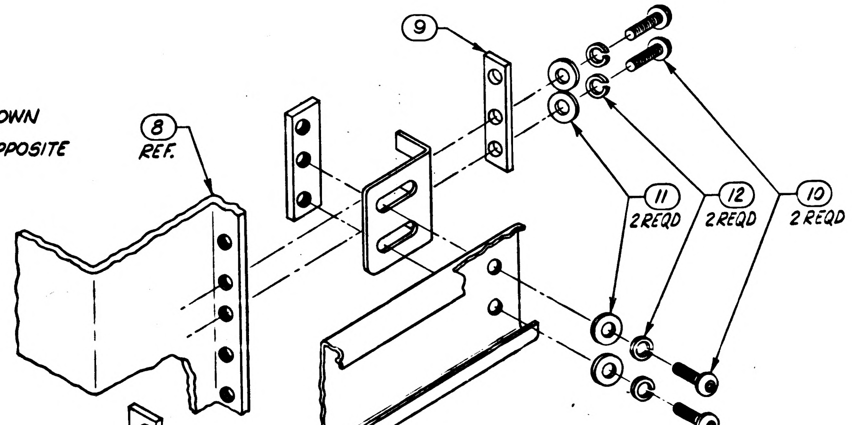
CODE IDENT NO.
SIZE E
1900000
SCALE 1:4
SHEET 1 OF 3

INCHES
PHOTOGRAPHIC SCALE ONLY

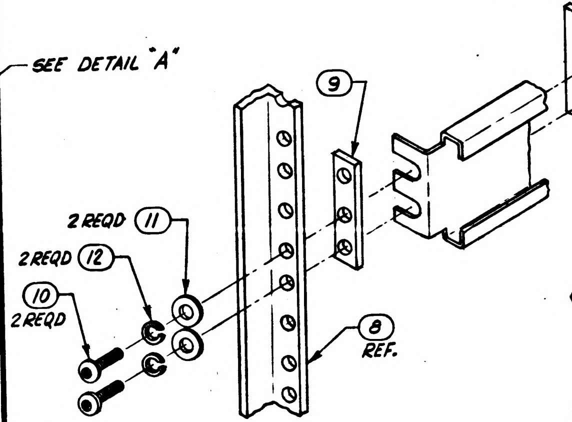
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		THIS SHEET ADDED PER MXC 192538 REVISED PER TDRR 05660		DEC 63 1/7/64	


SEE DETAIL "D"
SEE DETAIL "A"
SEE DETAIL "C"
SEE DETAIL "B"

SECTION A-A
(SHEET 1 ZONE E-7 & 8)
SCALE 1/2


LEFT SIDE SHOWN
RIGHT SIDE OPPOSITE
⑧ REF.
⑨
⑪ 2 REQD
⑫ 2 REQD
⑩ 2 REQD

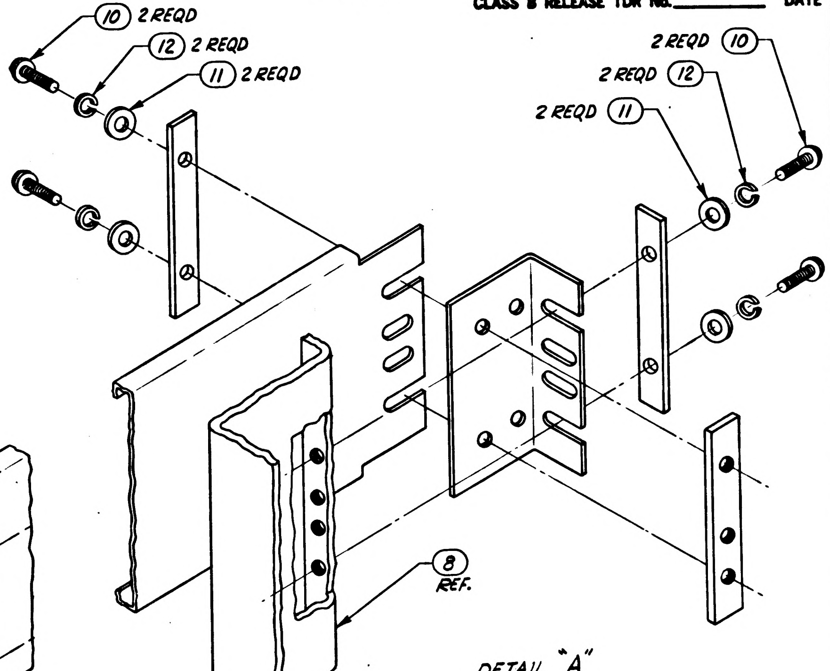
DETAIL "D"
SCALE 1/1
FOR MOUNTING ITEMS ⑩, ⑪ AND ⑫
TYPICAL 2 PLACES
REF. ①


⑨
2 REQD ⑪
2 REQD ⑫
⑩ 2 REQD
⑧ REF.

DETAIL "C"
SCALE 1/1
FOR MOUNTING ITEMS ⑩, ⑪ AND ⑫
TYPICAL 2 PLACES
REF. ①

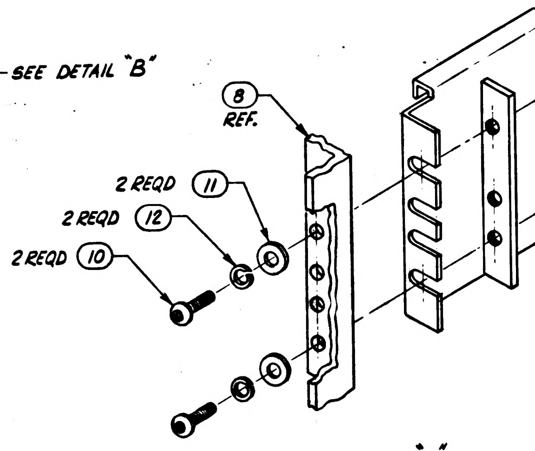
FOR INFORMATION ONLY

CLASS B RELEASE TDR No.________ DATE


⑩ 2 REQD
⑫ 2 REQD
⑪ 2 REQD
2 REQD ⑩
2 REQD ⑫
2 REQD ⑪
⑧ REF.

RIGHT SIDE SHOWN
LEFT SIDE OPPOSITE

DETAIL "A"
SCALE 1/1
FOR MOUNTING ITEMS ⑩, ⑪ AND ⑫
TYPICAL 4 PLACES
REF. ② ③


⑧ REF.
2 REQD ⑪
2 REQD ⑫
2 REQD ⑩

DETAIL "B"
SCALE 1/1
FOR MOUNTING ITEMS ⑩, ⑪ AND ⑫
TYPICAL 6 PLACES
REF. ② ③ ⑥

Ⓔ **THIS SHEET ADDED**

1900005-011	1900005-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN
NEXT ASSY	USED ON	MATERIAL	DRAWN John A. Kusidowski DATE 26 Oct 63 CHECKED G. Udovich 5 NOV 63 APPROVAL 6 Nov 63 APPROVAL C. Gedeman 1/6/64
APPLICATION		CONTRACT NAS-9-497	NASA APPROVAL MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

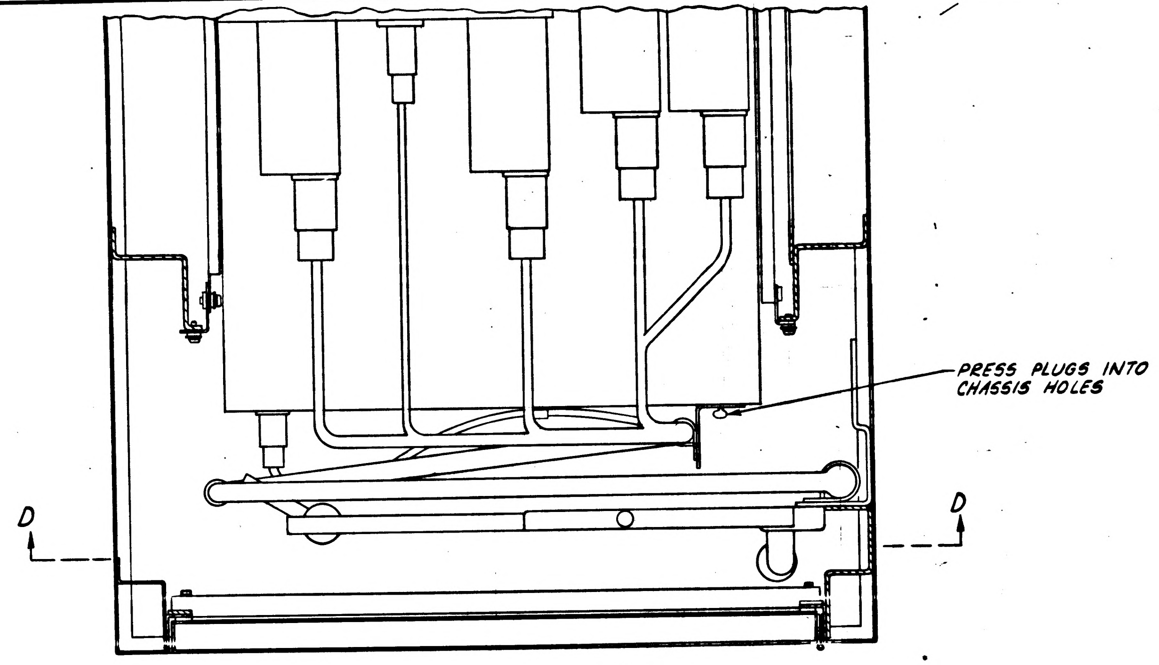
OSCILLOGRAPH CONSOLE
ASSEMBLY

CODE IDENT NO. SIZE E 1900000
SCALE NOTED SHEET 2 OF 3

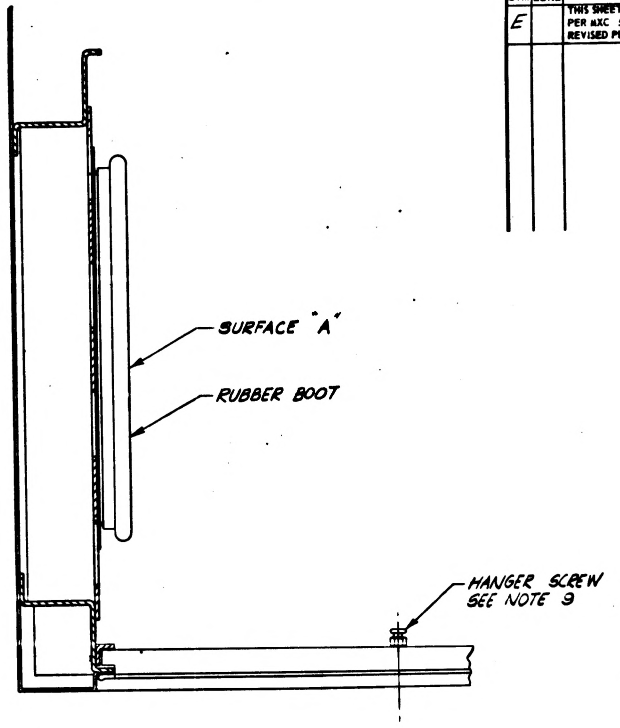
1900000 E

INCHES
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		THIS SHEET ADDED PER MXC 92538 REVISED PER TDRR 05660		1-7-64	

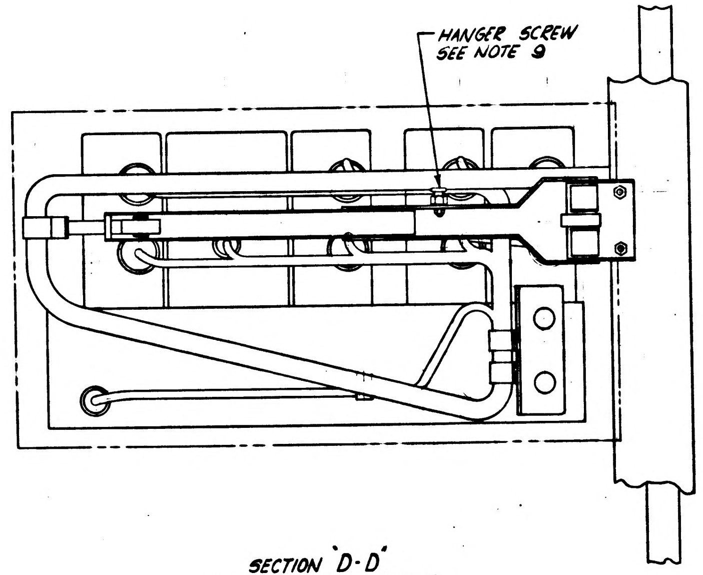

PRESS PLUGS INTO CHASSIS HOLES
D
D

SECTION "C-C"
(SHEET 1 ZONE 3-E)
SCALE 1/2

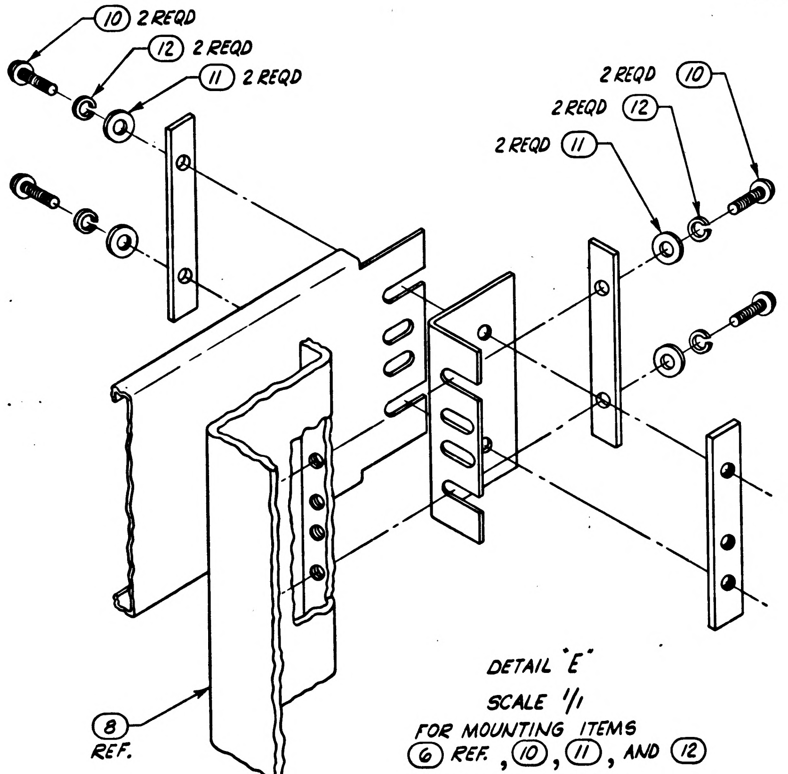

SURFACE "A"
RUBBER BOOT
HANGER SCREW SEE NOTE 9

SECTION "B-B"
(SHEET 1 ZONE, B-8)
SCALE 1/2

FOR INFORMATION ONLY
CLASS B RELEASE TDR No.________ DATE


HANGER SCREW SEE NOTE 9

SECTION "D-D"
HARNESS ARRANGEMENT
ALL DRAWERS SIMILAR
SCALE 1/2
SEE NOTE 10


⑩ 2 REQD
⑫ 2 REQD
⑪ 2 REQD
2 REQD ⑩
2 REQD ⑫
2 REQD ⑪
⑧ REF.

DETAIL "E"
SCALE 1/1
FOR MOUNTING ITEMS
⑥ REF., ⑩, ⑪, AND ⑫
TYPICAL 2 PLACES

RIGHT HAND SIDE SHOWN

Ⓔ THIS SHEET ADDED

1900005-011	1900005-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN John A. Szidowski DATE 26 Oct 63
CHECKED [illegible] 5 NOV 63
APPROVAL [illegible] 6 Nov 63
APPROVAL Goldman 1/6/64
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 7 Jan 64

MANNED
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HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE
ASSEMBLY

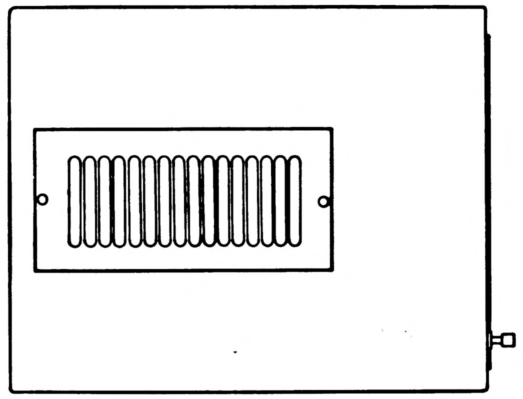
CODE IDENT NO.
SIZE E
1900000
SCALE NOTED
SHEET 3 OF 3

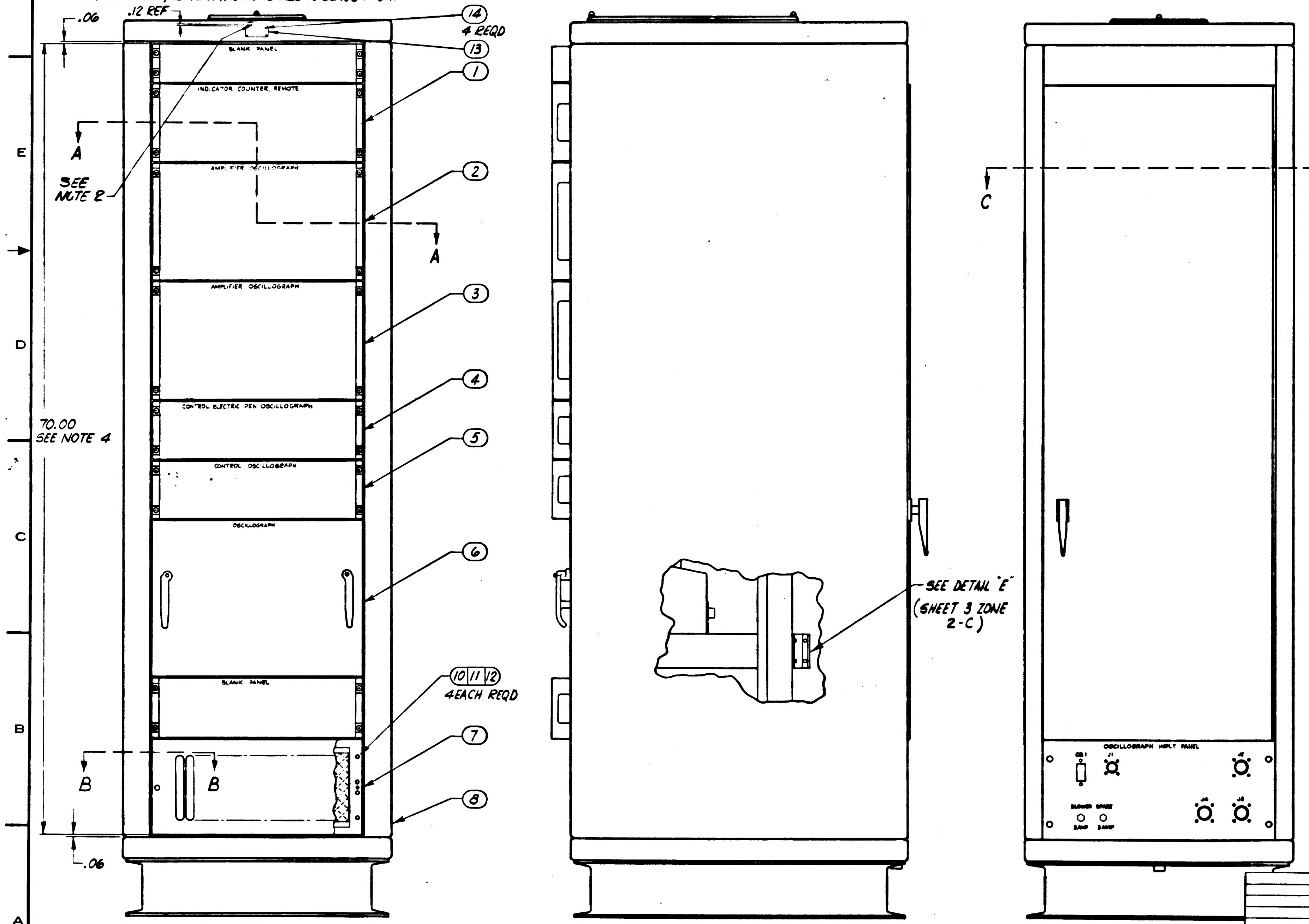
INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV___.) PER ND1002019. .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS: #10-32 , 37-40 IN LBS.
4. SPACING BETWEEN FRONT PANELS IS TO BE BALANCED THRU THIS DIMENSION. A .030 MIN. SPACE IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
6. APPLY ITEM (15) TO SURFACE "A".
7. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
8. UNLESS CONSOLE BASE IS FIRMLY ATTACHED TO A RIGID FLOOR, OVERTURN COULD RESULT WHEN 2 OF THE DRAWERS ARE EXTENDED, SEE ITEM (16).
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS PROVIDED AT 2 PLACES AS SHOWN WITH THE OPTION OF FORWARD OR BACKWARD HANGING.
11. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM (13) IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .06 HIGH.

Ⓔ SHEET NO.	SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
	E		REPLACES REV D WITH CHANGE PER MIC 92538 REVISED PER TDR 05660		11 DEC 63	
	F		ITEM 7 P/N WAS 015824-2, FAN ASS'Y, CENTRIFUGAL PER CM 93089		23 JAN 64	
	G		CHANGE IN ACCORDANCE WITH CM 193666 PER TDRR 08099		23 JAN 65	
	H		CHANGE IN ACCORDANCE WITH CM 195565		28 FEB 6[illegible]	
	J		CHANGE IN ACCORDANCE WITH CM-195651	08150	[illegible] MAR [illegible]	




.06
.12 REF
(14)
4 REQD
(13)
(1)
BLANK PANEL
INDICATOR COUNTER, REMOTE
A
SEE NOTE 2
AMPLIFIER OSCILLOGRAPH
(2)
A
AMPLIFIER OSCILLOGRAPH
(3)
CONTROL ELECTRIC PEN OSCILLOGRAPH
(4)
70.00
SEE NOTE 4
CONTROL OSCILLOGRAPH
(5)
OSCILLOGRAPH
(6)
BLANK PANEL
(10)(11)(12)
4EACH REQD
(7)
B
B
(8)
.06
C
C
SEE DETAIL "E"
(SHEET 3 ZONE 2-C)
OSCILLOGRAPH INPUT PANEL
CB1
J1
J2
BLOWER
SPARE
3 AMP
3 AMP
J4
J5

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01006 DATE 14 June 6[illegible]

J	E	E
H	E	E
G	E	E
F	E	E
E	E	E
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

Ⓔ REPLACES REV"D" WITH CHANGE

				011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				X		17	1901539	RUNNING LIST
SEE NOTE 8				X		16	1900270	INSTALLATION DRAWING 01A
SEE NOTE 6				AR		15	MIL-I-8660	DOW CORNING #4 LUB GREASE
				4		14	1897109-004	SCREW, DRIVE, ROUND HEAD
				1		13	1901304-124	NAMEPLATE
				52		12	MS-35338-81	WASHER LOCK #10
				52		11	AN-960-C10L	WASHER FLAT #10 (1897006-014)
SEE NOTE 5				52		10	1006783-44	SCREW BUTTON HD. HEX. SOCKET
				4		9	1900934	SPACER, BAR
				1		8	1900265-011	CABINET, ELECT. EQUIP. ASSY
				1		7	1900350-021	FAN, CENTRIFUGAL ASSEMBLY
				1		6	1900047-011	OSCILLOGRAPH
				1		5	1900046-011	CONTROL OSCILLOGRAPH ASSY
				1		4	1900164-011	CONTROL ELECT PEN OSCILLOGRAPH ASSY
				1		3	1900045-011	AMPLIFIER OSCILLOGRAPH ASSY
				1		2	1900044-011	AMPLIFIER OSCILLOGRAPH ASSY
				1		1	1900039-011	INDICATOR, COUNTER, REMOTE
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ——— ±.005 ± —
± ——— ±.02 ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN John A. [illegible] 26 Oct 63
CHECKED A. Udovich 5 NOV 63
APPROVAL [illegible] 6 Nov 63
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIL APPROVAL W. [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

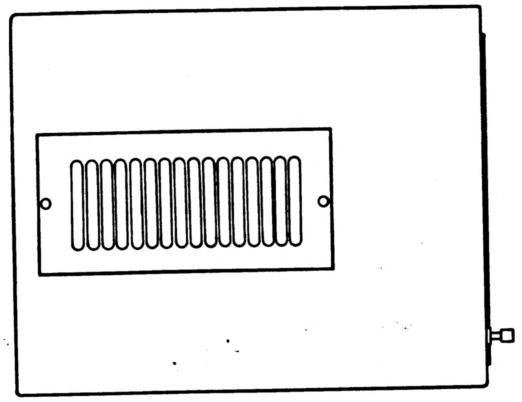
OSCILLOGRAPH CONSOLE
ASSEMBLY

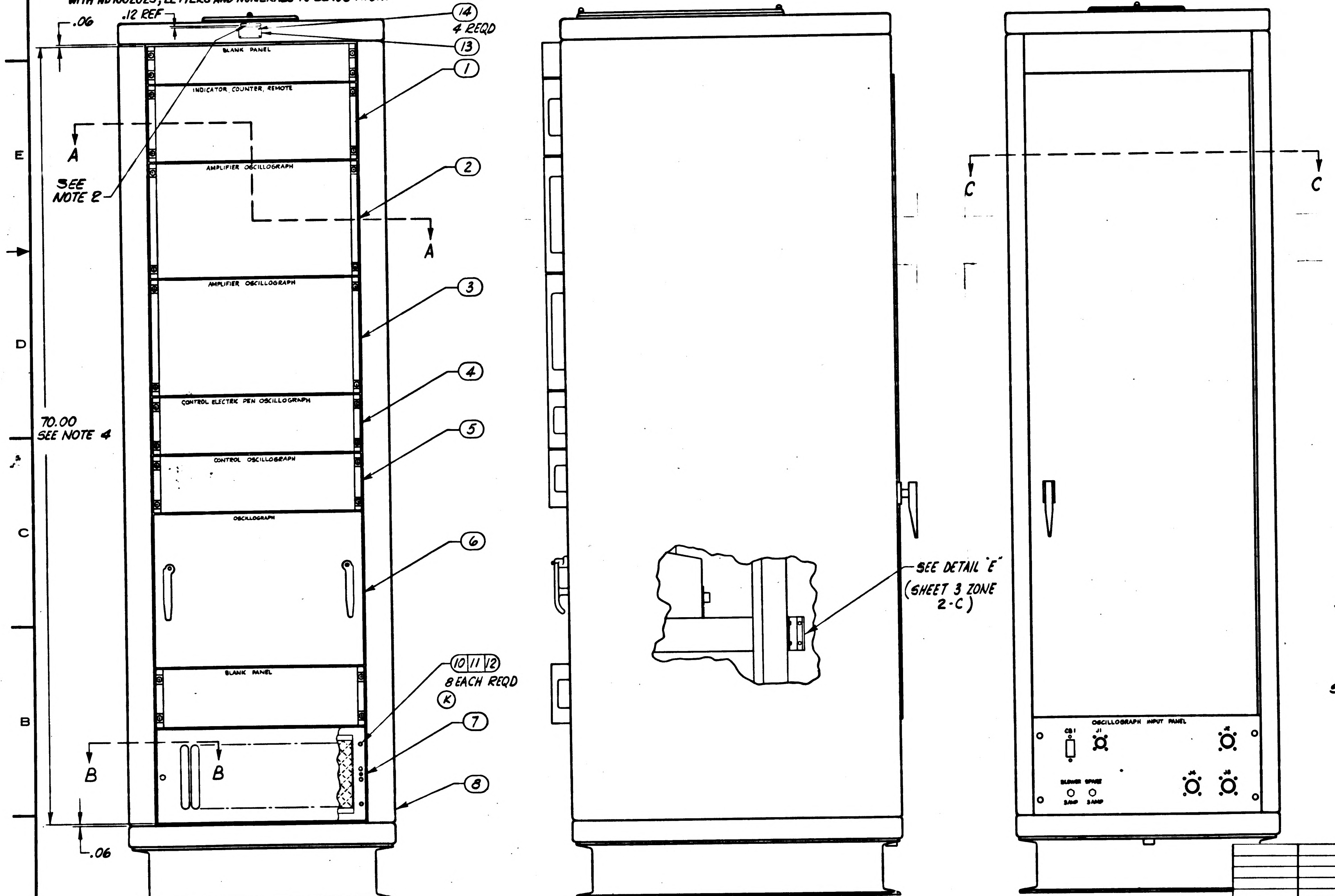
CODE IDENT NO.
SIZE E
1900000
SCALE 1:4
SHEET 1 OF 3

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV___.) PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS: #10-32 , 37-40 IN LBS.
4. SPACING BETWEEN FRONT PANELS IS TO BE BALANCED THRU THIS DIMENSION. A .030 MIN. SPACE IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
6. APPLY ITEM (15) TO SURFACE "A".
7. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
8. UNLESS CONSOLE BASE IS FIRMLY ATTACHED TO A RIGID FLOOR, OVERTURN COULD RESULT WHEN 2 OF THE DRAWER'S ARE EXTENDED, SEE ITEM (16).
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS PROVIDED AT 2 PLACES AS SHOWN WITH THE OPTION OF FORWARD OR BACKWARD HANGING.
11. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM (13) IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .06 HIGH.

SHEET NO.	SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
	E		REPLACES REV. D WITH CHANGE PER MXC 192538 REVISED PER TDR 05660		11 DEC 63 1/7/64	A.M.
	F		ITEM 7 P/N WAS 1015824-2, FAN ASS'Y, CENTRIFUGAL PER CM 193089		23 JAN 64	RLW
	G		CHANGE IN ACCORDANCE WITH CM 193666 PER TDRR 08099		23 JAN 63	RLW
	H		CHANGE IN ACCORDANCE WITH CM 195565		28 FEB 64	MEM
	J		CHANGE IN ACCORDANCE WITH CM-195651	08150	20 MAR 64	EF
	K		REVISED PER TDRR 10207		29 JUN 64	FL EF





FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01666 DATE 19 June 64

SHEET 1	SHEET 2	SHEET 3
K	E	E
J	E	E
H	E	E
G	E	E
F	E	E
E	E	E

REVISION STATUS OF SHEETS

(E) REPLACES REV'D' WITH CHANGE

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				X		17	1901539	RUNNING LIST
SEE NOTE 8				X		16	1900270	INSTALLATION DRAWING OIA
SEE NOTE 6				AR		15	MIL-I-8660	DOW CORNING #4 LUB GREASE
				4		14	1897109-004	SCREW, DRIVE, ROUND HEAD
				1		13	1901304-124	NAMEPLATE
				56		12	MS-35338-81	WASHER LOCK #10
				56		11	AN-960-C10L	WASHER FLAT #10 (1897006-019)
SEE NOTE 5				56		10	1006783-44	SCREW BUTTON HD. HEX. SOCKET
				4		9	1900934	SPACER, BAR
				1		8	1900265-011	CABINET, ELECT. EQUIP. ASSY
				1		7	1900350-021	FAN, CENTRIFUGAL ASSEMBLY
				1		6	1900047-011	OSCILLOGRAPH
				1		5	1900046-011	CONTROL OSCILLOGRAPH ASSY
				1		4	1900164-011	CONTROL, ELECT PEN OSCILLOGRAPH ASSY
				1		3	1900045-011	AMPLIFIER OSCILLOGRAPH ASSY
				1		2	1900044-011	AMPLIFIER OSCILLOGRAPH ASSY
				1		1	1900039-011	INDICATOR, COUNTER, REMOTE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS ±.005 ± .02 ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN John A. Kosidowski 26 Oct 63
CHECKED A. Udovich DATE 5 NOV 63
APPROVAL 6 Nov 63
APPROVAL L. Gedman 1/6/64
NASA APPROVAL
MIT APPROVAL 7 Jan 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

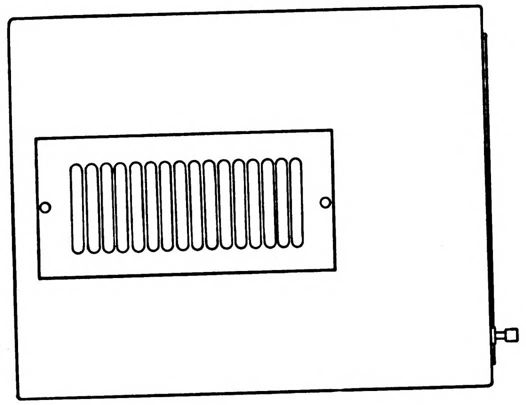
OSCILLOGRAPH CONSOLE ASSEMBLY

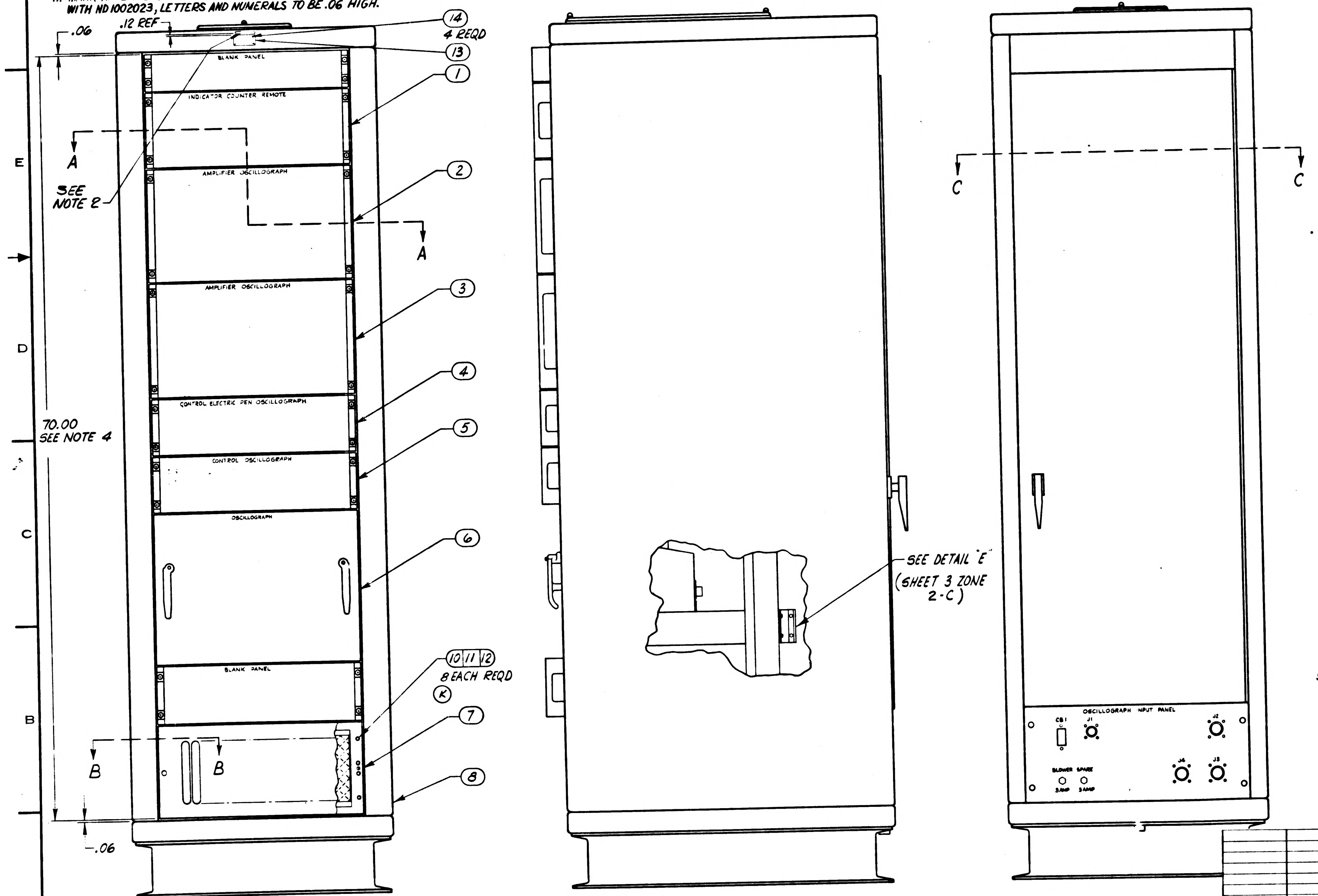
CODE IDENT NO.
SIZE E
1900000
SCALE 1:4
SHEET 1 OF 3

1900000 K

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV___.) PER ND1002019. .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS: #10-32 , 37-40 IN LBS.
4. SPACING BETWEEN FRONT PANELS IS TO BE BALANCED THRU THIS DIMENSION. A .030 MIN. SPACE IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
6. APPLY ITEM (15) TO SURFACE "A".
7. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
8. UNLESS CONSOLE BASE IS FIRMLY ATTACHED TO A RIGID FLOOR, OVERTURN COULD RESULT WHEN 2 OF THE DRAWER'S ARE EXTENDED, SEE ITEM (16).
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS PROVIDED AT 2 PLACES AS SHOWN WITH THE OPTION OF FORWARD OR BACKWARD HANGING.

11. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM (13) IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .06 HIGH.




.06
.12 REF
(14)
4 REQD
(13)
(1)
BLANK PANEL
INDICATOR COUNTER REMOTE
A
SEE NOTE 2
(2)
AMPLIFIER OSCILLOGRAPH
A
AMPLIFIER OSCILLOGRAPH
(3)
CONTROL ELECTRIC PEN OSCILLOGRAPH
(4)
CONTROL OSCILLOGRAPH
(5)
70.00
SEE NOTE 4
OSCILLOGRAPH
(6)
BLANK PANEL
(10)(11)(12)
8 EACH REQD
(K)
(7)
B
B
(8)
.06
SEE DETAIL "E"
(SHEET 3 ZONE 2-C)
C
C
OSCILLOGRAPH INPUT PANEL
CB1
J1
J2
J4
J3
BLOWER SPARE
3 AMP 3 AMP

SHEET NO.	SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
	E		REPLACES REV."D" WITH CHANGE PER MXC 92538 REVISED PER TDR 05660		DEC 63	
	F		ITEM 7 P/N WAS 1015824-2, FAN ASS'Y, CENTRIFUGAL PER CM 93089		23 JAN 64	
	G		CHANGE IN ACCORDANCE WITH CM 193666 PER TDRR 08099		29 JAN 63	
	H		CHANGE IN ACCORDANCE WITH CM 195565		28 FEB 64	MEM
(M)	J		CHANGE IN ACCORDANCE WITH CM-195651	08150	20 MAR 64	
(M)	K		REVISED PER TDRR 10207		29 JUN 64	
	L		CHANGE IN ACCORDANCE WITH ECM 304081 TDRR 14935		26 OCT 64	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01666 **DATE** 19 June 63

L	E	E
K	E	E
J	E	E
H	E	E
G	E	E
F	E	E
E	E	E
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

(E) REPLACES REV"D" WITH CHANGE

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				X		17	1901539	RUNNING LIST
SEE NOTE 8				X		16	1900270	INSTALLATION DRAWING OIA
SEE NOTE 6				AR		15	MIL-I-8660	DOW CORNING #4 LUB GREASE
				4		14	1897109-004	SCREW, DRIVE, ROUND HEAD
				1		13	1901304-124	NAMEPLATE
				56		12	MS-35338-81	WASHER LOCK #10
				56		11	AN-960-C10L	WASHER FLAT #10 (1897006-014)
SEE NOTE 5				56		10	1006783-44	SCREW BUTTON HD. HEX. SOCKET
				4		9	1900934	SPACER, BAR
				1		8	1900265-011	CABINET, ELECT. EQUIP ASSY
				1		7	1900350-021	FAN, CENTRIFUGAL ASSEMBLY
				1		6	1900047-011	OSCILLOGRAPH
				1		5	1900046-011	CONTROL OSCILLOGRAPH ASSY
				1		4	1900164-011	CONTROL ELECT PEN OSCILLOGRAPH ASSY
				1		3	1900045-021	AMPLIFIER OSCILLOGRAPH ASSY
				1		2	1900044-021	AMPLIFIER OSCILLOGRAPH ASSY
				1		1	1900039-011	INDICATOR, COUNTER, REMOTE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	

APPLICATION

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + —— DECIMALS ±.005 ±.02 ANGLES + ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN John A. Kosidowski DATE 26 Oct 63
CHECKED A. Udovich 5 NOV 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

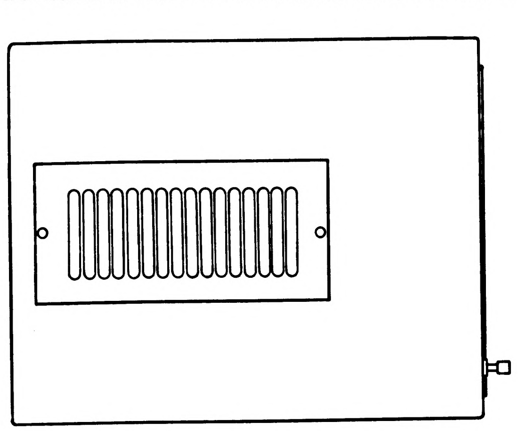
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE
ASSEMBLY

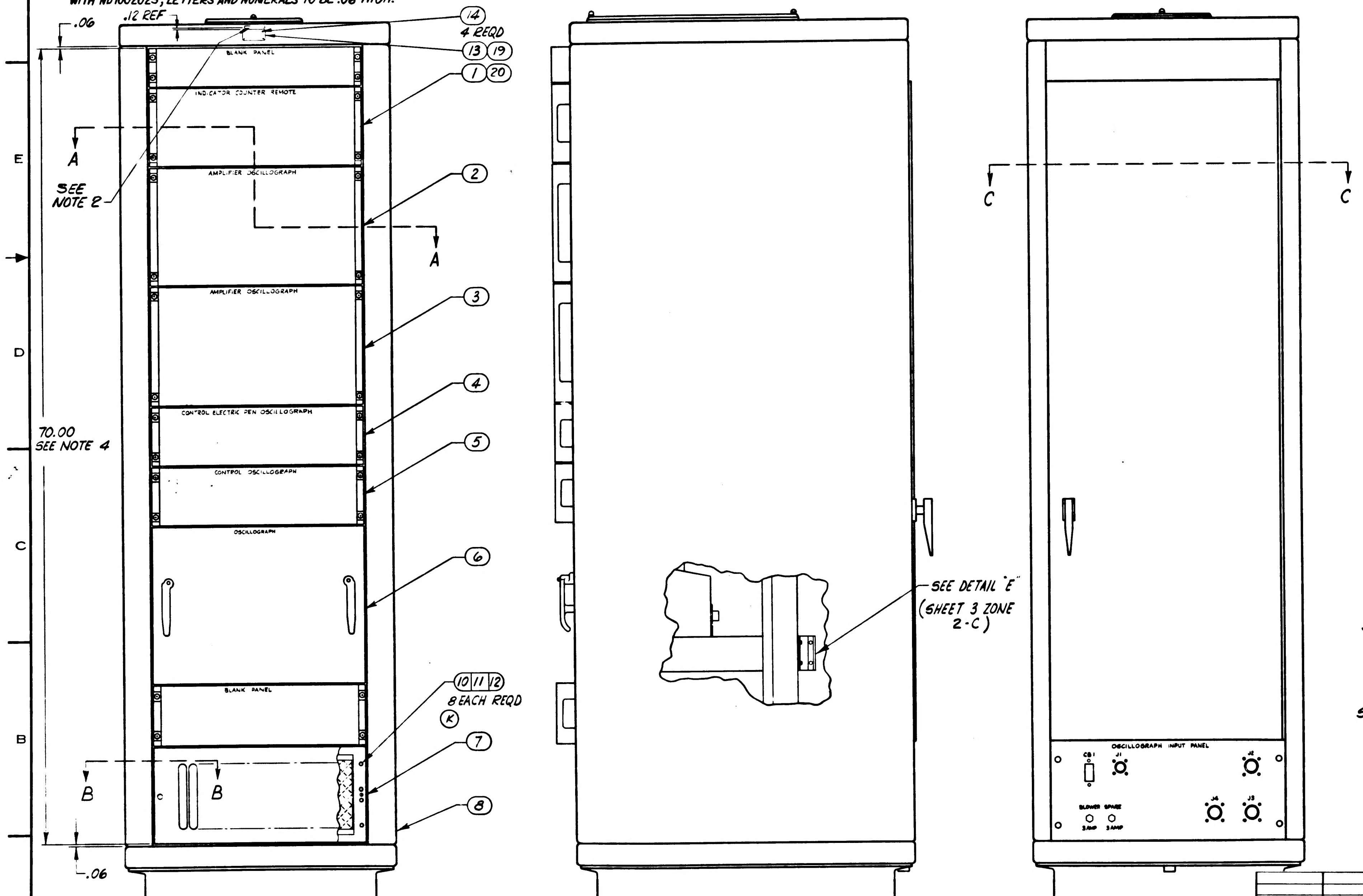
CODE IDENT NO. SIZE E 1900000
SCALE 1:4 SHEET 1 OF 3

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV___.) PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS: #10-32, 37-40 IN LBS.
4. SPACING BETWEEN FRONT PANELS IS TO BE BALANCED THRU THIS DIMENSION. A .030 MIN. SPACE IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
6. APPLY ITEM (15) TO SURFACE "A".
7. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
8. UNLESS CONSOLE BASE IS FIRMLY ATTACHED TO A RIGID FLOOR, OVERTURN COULD RESULT WHEN 2 OF THE DRAWERS ARE EXTENDED, SEE ITEM (16).
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS PROVIDED AT 2 PLACES AS SHOWN WITH THE OPTION OF FORWARD OR BACKWARD HANGING.
11. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM (13) IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .06 HIGH.
12. ADD ITEM 18 TO BOTH HARNESS CONNECTORS FOR INDICATOR, COUNTER REMOTE. THE STRAIN RELIEF SCREW OR STAND-OFF MAY BE USED FOR THIS ATTACHMENT. ALSO ADD ITEM 18 TO THE ASSOCIATED HARNESS BRACKET BY INSTALLING IT UNDER THE CABLE CLAMP ATTACHING SCREW'S HEAD. CONNECTORS P1-A1J1 AND P1-A1J2 AND BRACKET ASSEMBLY 1900448-011 INDICATED ABOVE ARE PART OF ITEM 8.



SHEET NO.	SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
	E		REPLACES REV."D" WITH CHANGE PER MXC 92538 REVISED PER TDR 05660		DEC 63	
	F		ITEM 7 P/N WAS 1015824-2 FAN ASSY, CENTRIFUGAL PER CM 93089		23 JAN 64	elW
	G		CHANGE IN ACCORDANCE WITH CM 193666 PER TDRR 08099		23 JAN 65	elW
	H		CHANGE IN ACCORDANCE WITH CM 195565		28 FEB 64	MEM
(M)	J		CHANGE IN ACCORDANCE WITH CM-195651	08.50	20 MAR 64	
(M)	K		REVISED PER TDRR 10207		29 JUN 64	
	L		CHANGE IN ACCORDANCE WITH ECM 304081		26 OCT 64	
	M		REVISED AND UPGRADED TO CLASS A PER TDRR 19104		2 MAY 66	M.T.Y



(E) REPLACES REV"D" WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			20	1900364-031	BLANK PANEL ASSY
			1			19		NAMEPLATE
SEE NOTE 12			3			18	1015990-1	LOOP, CABLE, DOUBLE ENDED
			X	X		17	1901539	RUNNING LIST
SEE NOTE 8			X	X		16	1900270	INSTALLATION DRAWING 01A
SEE NOTE 6			AR	AR		15	MIL-I-8660	DOW CORNING #4 LUB GREASE
			4	4		14	1897109-004	SCREW, DRIVE, ROUND HEAD
				1		13	1901304-124	NAMEPLATE
			56	56		12	MS-35338-81	WASHER LOCK #10
			56	56		11	AN-960-C10L	WASHER FLAT #10 (1897006-014)
SEE NOTE 5			56	56		10	1006783-44	SCREW BUTTON HD. HEX. SOCKET
			4	4		9	1900934	SPACER, BAR
			1	1		8	1900265-011	CABINET ELECT. EQUIP ASSY
			1	1		7	1900350-021	FAN, CENTRIFUGAL ASSEMBLY
			1	1		6	1900047-011	OSCILLOGRAPH
			1	1		5	1900046-011	CONTROL OSCILLOGRAPH ASSY
			1	1		4	1900164-011	CONTROL ELECT PEN OSCILLOGRAPH ASSY
			1	1		3	1900045-021	AMPLIFIER OSCILLOGRAPH ASSY
			1	1		2	1900044-021	AMPLIFIER OSCILLOGRAPH ASSY
				1		1	1900039-011	INDICATOR, COUNTER, REMOTE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± .005
± .02
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

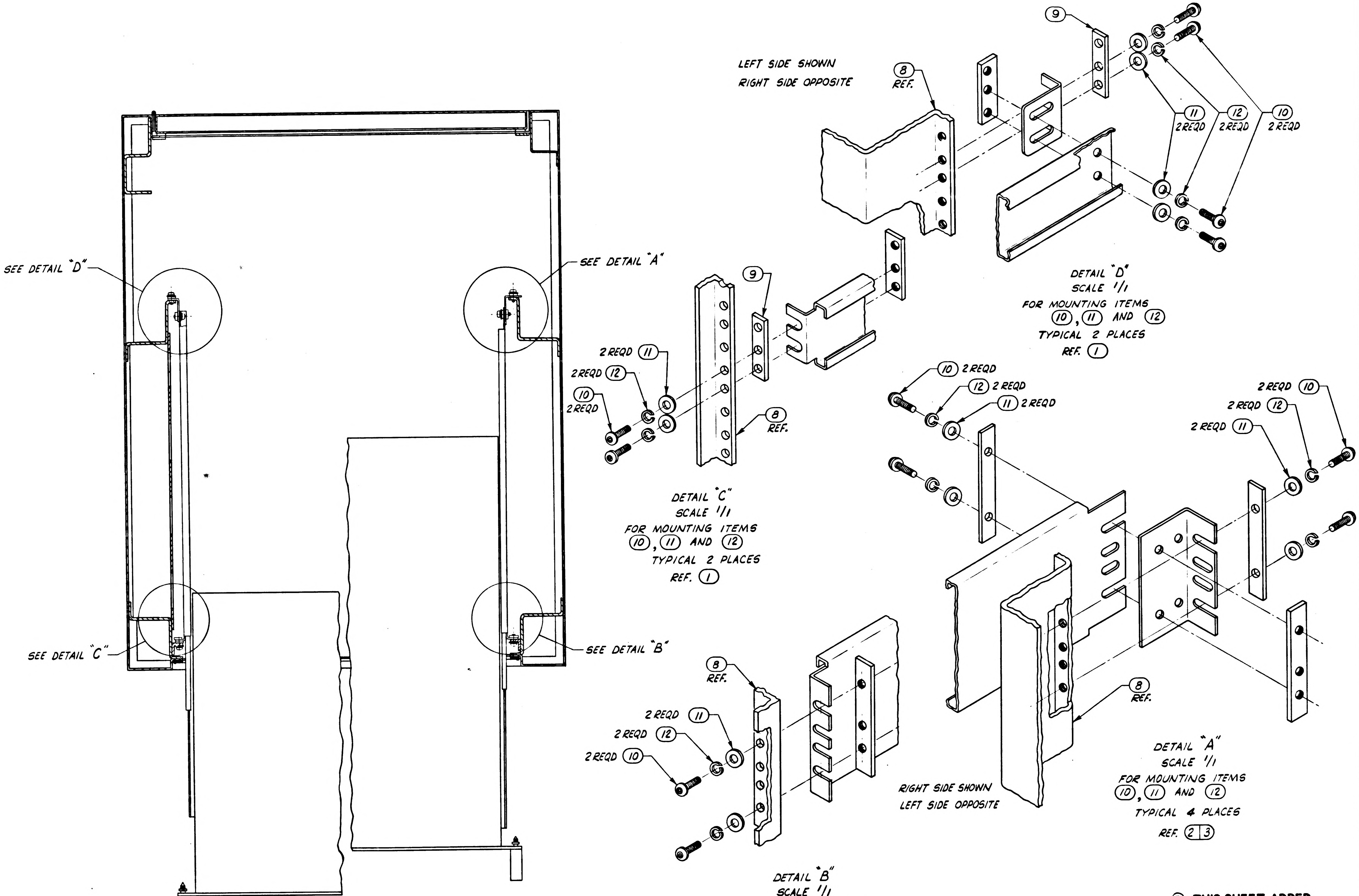
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN John A. Kosidowski 26 Oct 63
CHECKED A. Udovich 5 NOV 63
APPROVAL 6 Nov 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE
ASSEMBLY

CODE IDENT NO. 99974
SIZE E
1900000
SCALE 1:4
SHEET 1 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
E		THIS SHEET ADDED PER MXC 02538 REVISED PER TDRR 05660		DEC 63	
M		REVISED AND UPGRADED TO CLASS A PER TDRR 19.04		21 MAY 65	



LEFT SIDE SHOWN
RIGHT SIDE OPPOSITE
8
REF.
9
11
2 REQD
12
2 REQD
10
2 REQD
DETAIL "D"
SCALE 1/1
FOR MOUNTING ITEMS
10, 11 AND 12
TYPICAL 2 PLACES
REF. 1
SEE DETAIL "D"
SEE DETAIL "A"
SEE DETAIL "C"
SEE DETAIL "B"
2 REQD 11
2 REQD 12
10 2 REQD
9
8 REF.
DETAIL "C"
SCALE 1/1
FOR MOUNTING ITEMS
10, 11 AND 12
TYPICAL 2 PLACES
REF. 1
10 2 REQD
12 2 REQD
11 2 REQD
2 REQD 10
2 REQD 12
2 REQD 11
8 REF.
RIGHT SIDE SHOWN
LEFT SIDE OPPOSITE
DETAIL "A"
SCALE 1/1
FOR MOUNTING ITEMS
10, 11 AND 12
TYPICAL 4 PLACES
REF. 2 3
8 REF.
2 REQD 11
2 REQD 12
2 REQD 10
DETAIL "B"
SCALE 1/1
FOR MOUNTING ITEMS
10, 11 AND 12
TYPICAL 6 PLACES
REF. 2 3 6
SECTION A-A
(SHEET 1 ZONE E-7 & 8)
SCALE 1/2

Ⓔ THIS SHEET ADDED

1900005-011	1900005-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

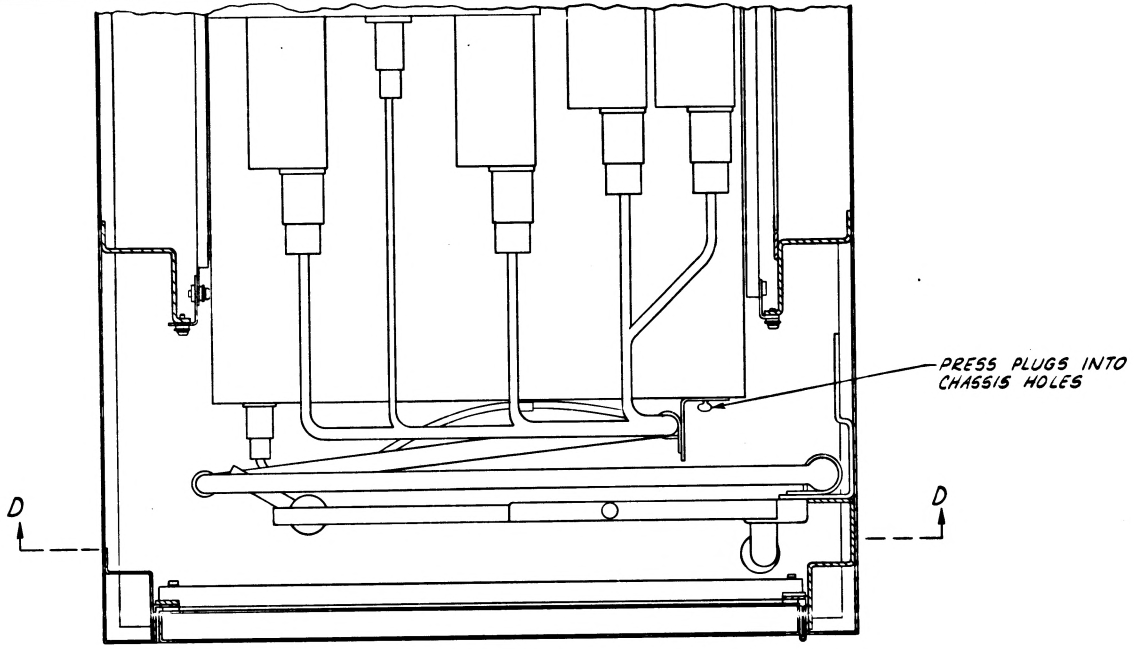
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN John A. Kowalewski DATE
CHECKED Udovich 5 NOV 63
APPROVAL 6 NOV 63
APPROVAL Geldman 1/6/64
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

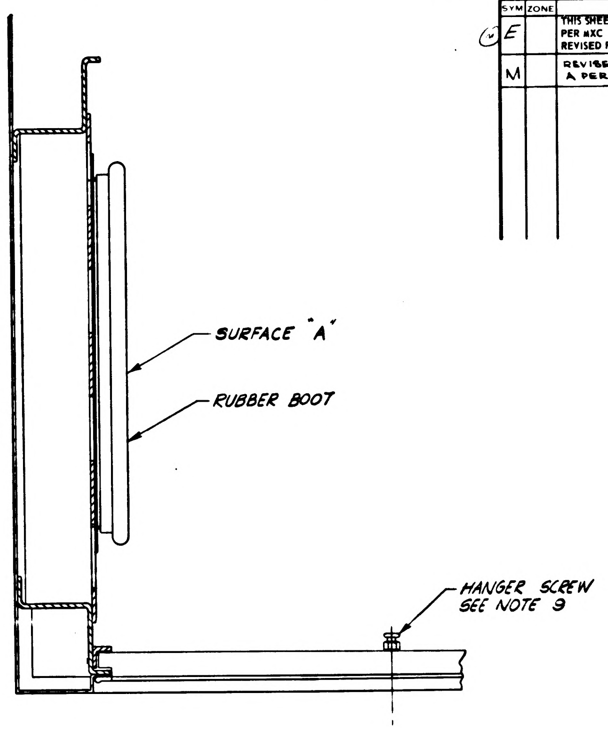
OSCILLOGRAPH CONSOLE
ASSEMBLY

CODE IDENT NO.
SIZE E
1900000
SCALE NOTED
SHEET 2 OF 3

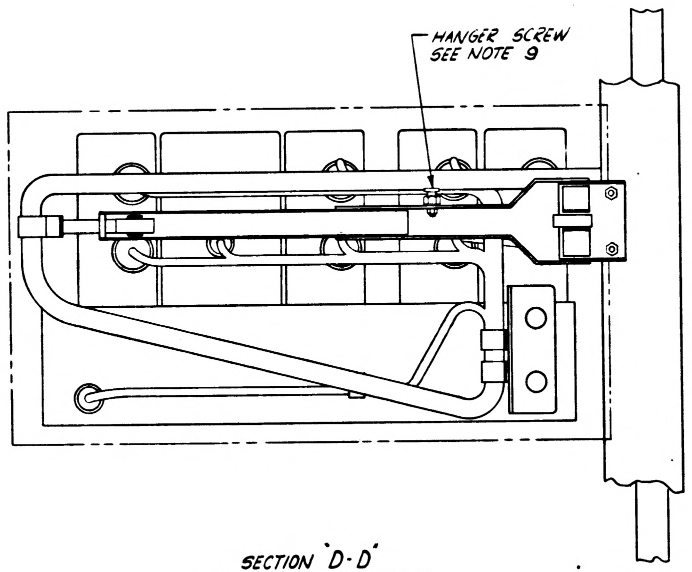
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
E		THIS SHEET ADDED PER MXC 92538 REVISED PER TDRR 05660		[illegible] [illegible]/64	[illegible]
M		REVISED AND UPGRADED TO CLASS A PER TDRR 19104		21 MAY 65	[illegible]


PRESS PLUGS INTO CHASSIS HOLES
D
D

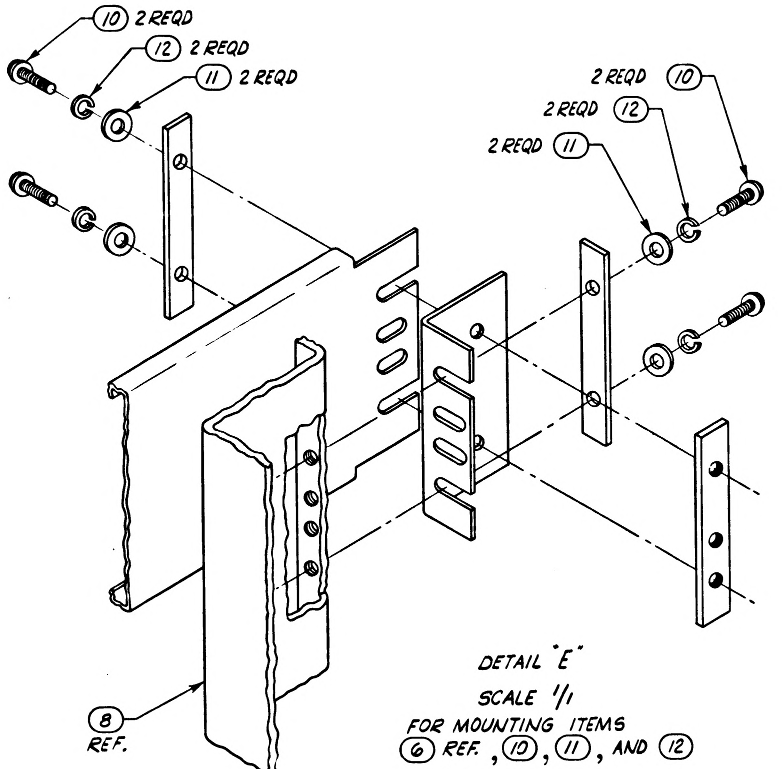
SECTION "C-C"
(SHEET 1 ZONE 3-E)
SCALE 1/2


SURFACE "A"
RUBBER BOOT
HANGER SCREW SEE NOTE 9

SECTION "B-B"
(SHEET 1 ZONE, B-8)
SCALE 1/2


HANGER SCREW SEE NOTE 9

SECTION "D-D"
HARNESS ARRANGEMENT
ALL DRAWERS SIMILAR
SCALE 1/2
SEE NOTE 10


(10) 2 REQD
(12) 2 REQD
(11) 2 REQD
2 REQD (10)
2 REQD (12)
2 REQD (11)
(8) REF.

DETAIL "E"
SCALE 1/1
FOR MOUNTING ITEMS
(6) REF., (10), (11), AND (12)
TYPICAL 2 PLACES

RIGHT HAND SIDE SHOWN

(E) THIS SHEET ADDED

1900005-011	1900005-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN
NEXT ASSY	USED ON	MATERIAL	ACSP PN
APPLICATION		CONTRACT NAS-9-497	DRAWN John A. Spadowski DATE 26 Oct 63 CHECKED Gildorch 5 NOV 63 APPROVAL [illegible] 6 Nov 63 APPROVAL C. Goldman 1/6/64 NASA APPROVAL [illegible] MIT APPROVAL [illegible] Jan 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE
ASSEMBLY

CODE IDENT NO.	SIZE	
99974	E	1900000
SCALE NOTED		SHEET 3 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01666 **DATE** 19 Jun 63

			1				
			1			1900265	CABINET, ELECT EQUIP ASSY
			1			1015824-2	FAN ASSEMBLY, CENTRIFUGAL
			1			1900047	OSCILLOGRAPH
			1			1900046	OSCILLOGRAPH CONTROL
			1			1900164	CONTROL, ELECT PEN, OSCILLOGRAPH
			1			1900045	OSCILLOGRAPH AMPLIFIER
			1			1900044	OSCILLOGRAPH AMPLIFIER
			1			1900039	INDICATOR, COUNTER, REMOTE
			011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900005-011	1900005-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	. −	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN W. Thiel DATE 6 JUN 63
CHECKED Mal Cawsta 6 Jun 63
APPROVAL G. Stoddard 7 June 63
APPROVAL L Gelemen June 17, 1963
NASA APPROVAL Jack Barnes
MIT APPROVAL 19 Jun 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH CONSOLE
ASSEMBLY

CODE IDENT NO.
SIZE C
1900000
SCALE —
SHEET

MIL 1078C—F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY	PART NO.	DESCRIPTION ⓜ
1	1900034	GALVANOMETER
1	1900037	OSCILLOSCOPE, DUAL BEAM
2	1900038	OSCILLOSCOPE, MONITOR
1	1900035	POWER SUPPLY, ELECTRONIC
1	1900033	POWER SUPPLY, GUIDANCE SYSTEM
1	1900042	VOLTMETER, DIGITAL
1	1900039	INDICATOR, COUNTER, REMOTE
1	1900031	CABINET ASSY, ELECTRICAL EQUIP
1	1900052	RECORDER, DIGITAL
1	1900041	COUNTER
1	1900053	CURRENT SOURCE MONITOR
1	1900036	VOLTMETER, PHASE ANGLE
1	1900049	POWER SUPPLY, RELAY & LAMP
1	1900043	GENERATOR, SIGNAL ASSY
1	1900056	SELECTOR, SIGNAL, OSCILLOGRAPH
1	1900057	SELECTOR, SIGNAL, PRIMARY

REVISIONS

SYM	DESCRIPTION	CHG NO.	DATE	APPD.
A	Ⓐ CHANGED IN ACCORDANCE WITH MXC 185869	MXC 185869	25 APR 63	FL / EF
A1	(A1) CHANGED IN ACCORDANCE WITH MXC 185917	MXC 185917	25 APR 63	FL / EF
A2	(A2) CHANGED IN ACCORDANCE WITH MXC 185963	MXC 185963	25 APR 63	FL / EF
A3	(A3) CHANGED IN ACCORDANCE WITH MXC 185979	MXC 185979	25 APR 63	FL / EF
A4	(A4) CHANGED IN ACCORDANCE WITH MXC 186151	MXC 186151	25 APR 63	FL / EF
B	PER TDRR 01214		8 MAY 63	WK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL AMBray
APPROVAL ARodel 22 FEB 63
NASA APPROVAL W.S. Swingle 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS-INERTIAL
ANALYZER

CODE IDENT NO.
SIZE B
1900004
SCALE
SHEET

MIL 10778—F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY	PART NO.	DESCRIPTION
1	1900034	GALVANOMETER
1	1900037	OSCILLOSCOPE, DUAL BEAM
2	1900038	OSCILLOSCOPE, MONITOR
2	1900035	POWER SUPPLY, ELECTRONIC
1	1900033	POWER SUPPLY, GUIDANCE SYSTEM
1	1900042	VOLTMETER, DIGITAL
1	1900039	INDICATOR, COUNTER, REMOTE
1	1900031	CABINET ASSY, ELECTRICAL EQUIP
1	1900052	RECORDER, DIGITAL
1	1900041	COUNTER
1	1900053	CURRENT SOURCE MONITOR
1	1900036	VOLTMETER, PHASE ANGLE
1	1900049	POWER SUPPLY, RELAY & LAMP
1	1900043	GENERATOR, SIGNAL ASSY
1	1900056	SELECTOR, SIGNAL, OSCILLOGRAPH
1	1900057	SELECTOR, SIGNAL, PRIMARY
1	1900060	POWER SUPPLY & LOAD PANEL ASSY.
1	1900044	OSCILLOGRAPH AMPLIFIER ASSY.
1	1900046	OSCILLOGRAPH CONTROL ASSY.
1	1900047	OSCILLOGRAPH ASSY.
1	1900082	SELECTOR, TEST
1	1900059	CONTROL, TEST
1	1900054	CONTROL, GIMBAL POSITION
1	1900058	TEMPERATURE, MONITOR & CONTROL
1	1900048-011	SWITCH, BOX ASSY.
1	1900164-011	OSCILLOGRAPH, ELECTRIC PEN CONTROL ASS'Y.
1	1900045-011	AMPLIFIER OSCILLOGRAPH ASS'Y.

REVISIONS

SYM	DESCRIPTION	CHG NO.	DATE	APPD.
A	Ⓐ CHANGED IN ACCORDANCE WITH MXC 185869	MXC 185869	25 APR 63	FL EF
A1	(A1) CHANGED IN ACCORDANCE WITH MXC 185917	MXC 185917	25 APR 63	FL EF
A2	(A2) CHANGED IN ACCORDANCE WITH MXC 185963	MXC 185963	25 APR 63	FL EF
A3	(A3) CHANGED IN ACCORDANCE WITH MXC 185979	MXC 185979	25 APR 63	FL EF
A4	(A4) CHANGED IN ACCORDANCE WITH MXC 186151	MXC 186151	25 APR 63	FL EF
B	PER TDRR 01214		8 MAY 63	W.K.
B-1	CHANGED IN ACCORDANCE WITH MXC-186243	MCX-186243	23-MAY-63	M.G. AU.
B-2	CHANGED IN ACCORDANCE WITH MXC-186244	MXC-186244		
B-3	CHANGED IN ACCORDANCE WITH MXC-186286	MXC-186286		
B-4	CHANGED IN ACCORDANCE WITH MXC-186340	MXC-186340		
B-5	CHANGED IN ACCORDANCE WITH MXC-186684	MXC-186684		
C	PER TDRR 01520		12 June 63	R.K.B.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALINOWSKI 22 FEB 63
APPROVAL A M Bray
APPROVAL A Rodel 22 FEB 63
NASA APPROVAL W. S. Swingle 13 March 1963
MIT APPROVAL W. L. Rupp 13 Mar 63

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SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO.
SIZE B
1900004
SCALE
SHEET

MIL 10778-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

QTY	PART NO.	DESCRIPTION
1	1900166	PANEL, COAXIAL DISTRIBUTION Ⓜ
1	1900037	OSCILLOSCOPE, DUAL BEAM
2	1900038	OSCILLOSCOPE, MONITOR
1	1900035	POWER SUPPLY. ELECTRONIC
1	1900055-011	MONITOR PANEL ASS'Y
1	1900042	VOLTMETER, DIGITAL
1	1900039	INDICATOR, COUNTER, REMOTE
1	1900031	CABINET ASSY, ELECTRICAL EQUIP
1	1900052	RECORDER, DIGITAL
1	1900041	COUNTER
1	1900036	VOLTMETER, PHASE ANGLE
1	1900049	POWER SUPPLY, RELAY & LAMP Ⓜ
1	1900043	GENERATOR, SIGNAL ASSY
1	1900056	SELECTOR, SIGNAL, OSCILLOGRAPH
1	1900057	SELECTOR, SIGNAL, PRIMARY
1	1900060	POWER SUPPLY & LOAD PANEL ASSY.
1	1900044	OSCILLOGRAPH AMPIFIER ASSY.
1	1900046	OSCILLOGRAPH CONTROL ASSY.
1	1900047	OSCILLOGRAPH ASSY. Ⓜ
1	1900082	SELECTOR, TEST
1	1900059	CONTROL, TEST
1	1900054	CONTROL, GIMBAL POSITION
1	1900058	TEMPERATURE, MONITOR & CONTROL
1	1900048-011	SWITCH, BOX ASSY.
1	1900164-011	OSCILLOGRAPH, ELECTRIC PEN CONTROL ASS'Y.
1	1900045-011	AMPLIFIER OSCILLOGRAPH ASSY

REVISIONS

SYM	DESCRIPTION	CHG NO.	DATE	APPD.
A	Ⓐ CHANGED IN ACCORDANCE WITH MXC 185869	MXC 185869	25 APR 63	FL EF
A1	(A1) CHANGED IN ACCORDANCE WITH MXC 185917	MXC 185917	25 APR 63	FL EF
A2	(A2) CHANGED IN ACCORDANCE WITH MXC 185963	MXC 185963	25 APR 63	FL EF
A3	(A3) CHANGED IN ACCORDANCE WITH MXC 185979	MXC 185979	25 APR 63	FL EF
A4	(A4) CHANGED IN ACCORDANCE WITH MXC 186151	MXC 186151	25 APR 63	FL EF
B	PER TDRR 01214		8 MAY 63	W.K.
B-1	CHANGED IN ACCORDANCE WITH MXC-186243	MCX-186243	23-MAY-63	M.G. AU.
B-2	~~CHANGED IN ACCORDANCE WITH MXC-186244~~	~~MXC-186244~~		
B-3	CHANGED IN ACCORDANCE WITH MXC-186286	MXC-186286		
B-4	CHANGED IN ACCORDANCE WITH MXC-186340	MXC-186340		
B-5	CHANGED IN ACCORDANCE WITH MXC-186684	MXC-186684		
C	PER TDRR 01520		12 June 63	R.K.B.
C-1	CHANGED IN ACCORDANCE WITH MXC-186759	MXC 186759	18 JUNE 63	J.J.J. C.F.P.
C-2	CHANGED IN ACCORDANCE WITH MXC-186922	MXC 186922		
C-3	CHANGED IN ACCORDANCE WITH MXC-187131	MXC 187131		
C-4	CHANGED IN ACCORDANCE WITH MXC-187181	MXC 187181		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 63

REV. LTR D

REPLACED WITH CHANGE BY REVISION E PER MXC 187247
TDRR 01933
M.B.J. 7/10/63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ + +
− − −
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALINOWSKI 22 FEB 63
APPROVAL A.M. Bray
APPROVAL A. Rodel 22 FEB 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 MAR 63

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ANALYZER

CODE IDENT NO.
SIZE B
1900004
SCALE
SHEET

MIL 10778—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		REPLACES REVISION D WITH CHANGE PER MXC 18247	TDRR 01933	27 JUN 63	L.E.M. 2 JUL 63

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 18 MAR 64

			1			1900048-011	SWITCH, BOX ASS'Y
			1			1900058	TEMPERATURE, MONITOR & CONTROL
			1			1900054	CONTROL, GIMBAL POSITION
			1			1900059	CONTROL, TEST
			1			1900082	SELECTOR, TEST
			1			1900060	POWER SUPPLY & LOAD PANEL ASS'Y
			1			1900057	SELECTOR, SIGNAL, PRIMARY
			1			1900056	SELECTOR, SIGNAL, OSCILLOGRAPH
			1			1900043	GENERATOR, SIGNAL ASS'Y
			1			1900049	POWER SUPPLY, RELAY & LAMP
			1			1900036	VOLTMETER, PHASE ANGLE
			1			1900041	COUNTER
			1			1900052	RECORDER, DIGITAL
			1			1900031	CABINET ASS'Y, ELECTRICAL EQUIP
			1			1900042	VOLTMETER, DIGITAL
			1			1900055-011	MONITOR PANEL ASS'Y
			1			1900035	POWER SUPPLY, ELECTRONIC
			2			1900038	OSCILLOSCOPE, MONITOR
			1			1900037	OSCILLOSCOPE, DUAL BEAM
			1			1900166	PANEL, COAXIAL DISTRIBUTION
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

REPLACES REVISION D WITH
CHANGE PER MXC 187247

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL A.M. BRAY
APPROVAL J. Gilmore 8 July 63
NASA APPROVAL Jack Barnard
MIT APPROVAL M.B. Trageser 7/10/63

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ANALYZER

CODE IDENT NO.
SIZE C
1900004
SCALE ~
SHEET 1 OF 1

1900004 E

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900004

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
L	—	CHANGE IN ACCORDANCE WITH MXC 190874		30 OCT 63	WSM
M		REPLACED WITH CHANGE BY REV N PER CM-193360. PER TDRR 06565		8 JAN 64	RJM

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		REPLACES REVISION D WITH CHANGE PER MXC 187247	TDRR 01933	27 JUN 63	E.M.
E1		CHANGED IN ACCORDANCE WITH MXC 187249	MXC 187249	19 JUL 63	C.A.M.
F		CHANGED IN ACCORDANCE WITH MXC 187314	MXC 187314	19 JUL 63	C.A.M.
G		CHANGED IN ACCORDANCE WITH MXC 187686	MXC 187686	19 JUL 63	C.A.M.
H		CHANGED IN ACCORDANCE WITH MXC 188184	MXC 188184	25 JUL 63	C.A.M.
J		CHANGED IN ACCORDANCE WITH MXC 188858	MXC 188858	21 AUG 63	
K		CHANGE IN ACCORDANCE WITH MXC 189571 REVISED PER TDRR 03216	MXC 189571 9/17/67	3 SEPT 63	JHH

Ⓝ

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			4			AN 535-0-4	SCREW, DRIVE, ROUND HEAD
			1			1900704	NAMEPLATE, APOLLO G&N
			X			1900016	INSTALLATION DRAWING, O.I.A.
			1			1900163-011	PHASE SHIFT PANEL ASS'Y
			2			1900350-011	FAN, CENTRIFUGAL, ASSEMBLY
			1			1900075-011	PANEL, PROTECTION, A.C. POWER
			1			1900048-011	SWITCH, BOX ASS'Y
			1			1900058-011	TEMPERATURE, MONITOR & CONTROL
			1			1900054-011	CONTROL, GIMBAL POSITION
			1			1900059-011	CONTROL, TEST
			1			1900082-011	SELECTOR, TEST
			1			1900702-011	POWER SUPPLY & LOAD PANEL ASS'Y
			1			1900057-011	SELECTOR, SIGNAL, PRIMARY
			1			1900056-011	SELECTOR, SIGNAL, OSCILLOGRAPH
			1			1900043-011	GENERATOR, SIGNAL ASS'Y
			1			1900049-011	POWER SUPPLY, RELAY & LAMP
			1			1900036-011	VOLTMETER, PHASE ANGLE
			1			1900041-011	COUNTER
			1			1900052-011	RECORDER, DIGITAL
			1			1900031-011	CABINET ASS'Y, ELECTRICAL EQUIP
			1			1900042-011	VOLTMETER, DIGITAL
			1			1900055-011	MONITOR PANEL ASS'Y
			1			1900035-011	POWER SUPPLY, ELECTRONIC
			2			1900038-011	OSCILLOSCOPE, MONITOR
			1			1900037-011	OSCILLOSCOPE, DUAL BEAM
			1			1900166-011	PANEL, COAXIAL DISTRIBUTION

Ⓜ REPLACED WITH CHANGE BY REV N

REPLACES REVISION D WITH CHANGE PER MXC 187247

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL A.M. BRAY
APPROVAL J. Gilmore 5 July 63
NASA APPROVAL Jack Barnard
MIT APPROVAL M.B. Trageser 7/10/63

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SPACECRAFT CENTER
HOUSTON, TEXAS

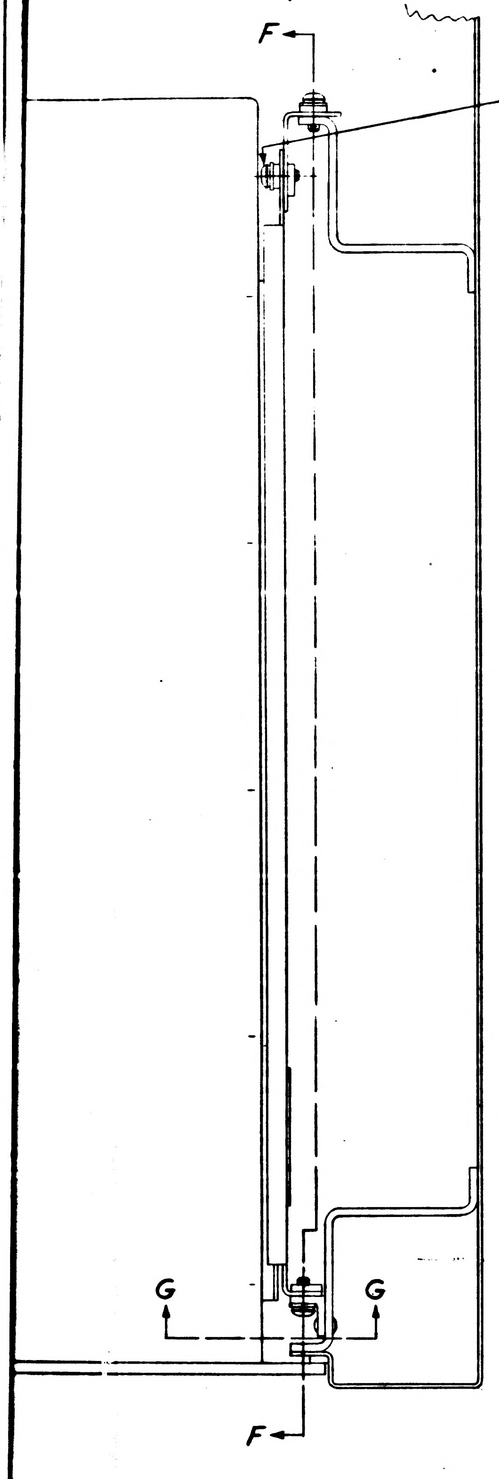
OPTICS-INERTIAL
ANALYZER

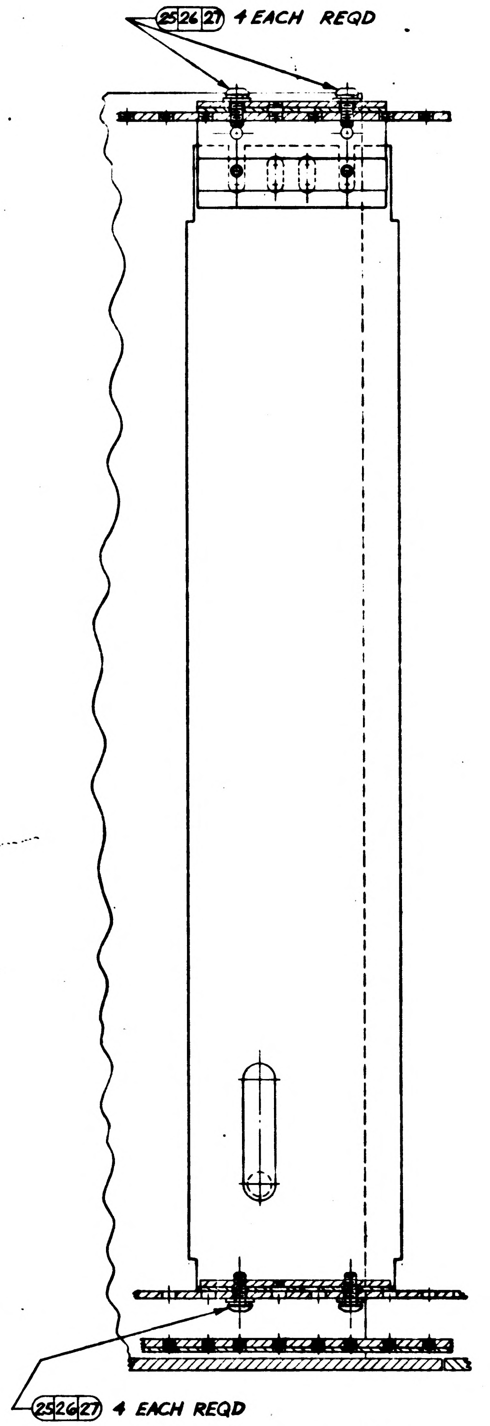
CODE IDENT NO.
SIZE C
1900004
SCALE ~
SHEET 1 OF 1

MIL 1078C—P

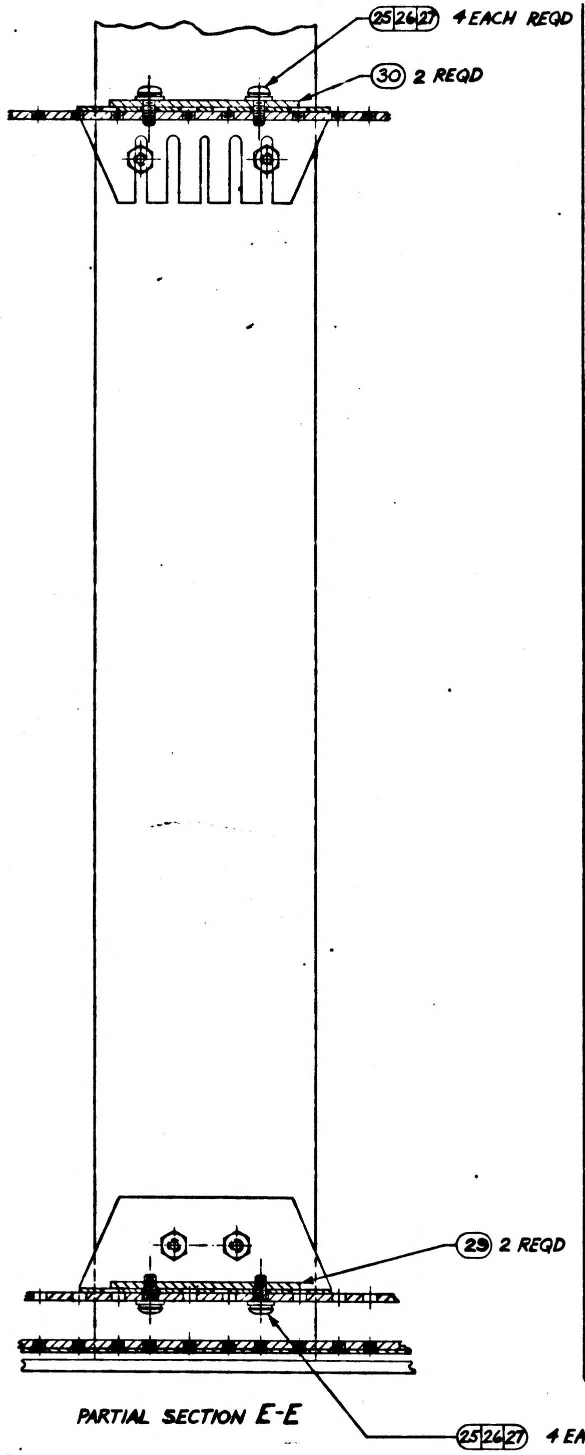
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		THIS SHEET ADDED. IN ACCORDANCE WITH CM-19336C PER TDRR		3 JAN 64	RJM

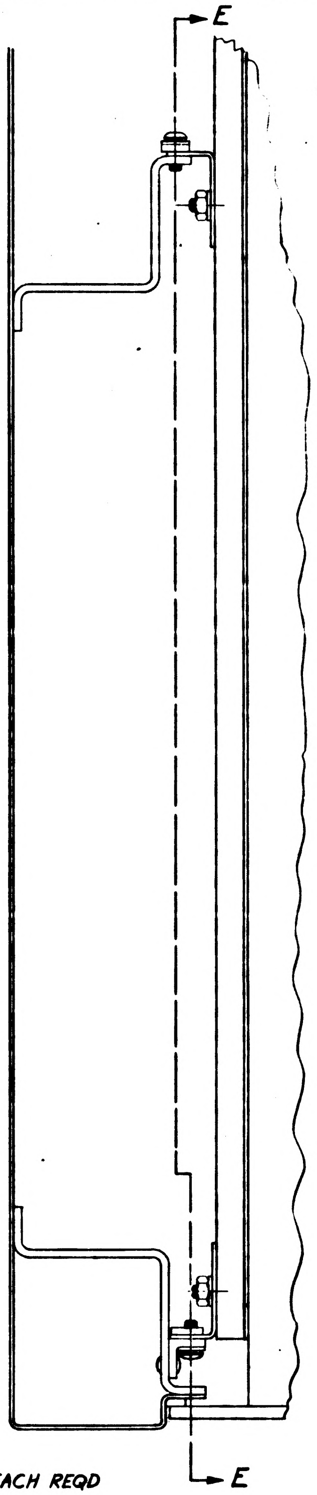




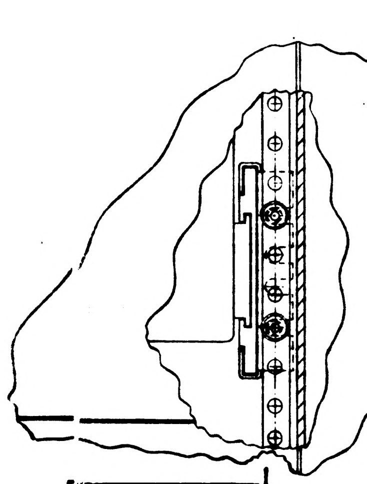
PARTIAL SECTION F-F



PARTIAL SECTION E-E



PARTIAL SECTION C-C
SCALE 1/1
FOR MOUNTING PART NO. 1014061 (REF.)
LEFT SIDE SHOWN
RIGHT SIDE SYMMETRICALLY OPPOSITE



PARTIAL SECTION G-G

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63

Ⓝ THIS SHEET ADDED
Ⓝ REPLACES REV M WITH CHANGE

1900005-011	1900005-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.02 ±.02	+ —
— —	±.005 .005	— —

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 21 FEB 63
CHECKED A. Udovich 12 NOV 63
APPROVAL 13 Nov 63
APPROVAL L. Gedimen 2/21/64
NASA APPROVAL W. J. 2-25-64
MIT APPROVAL

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HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO.
SIZE J
1900004
SCALE 1/4
SHEET 2 OF 2

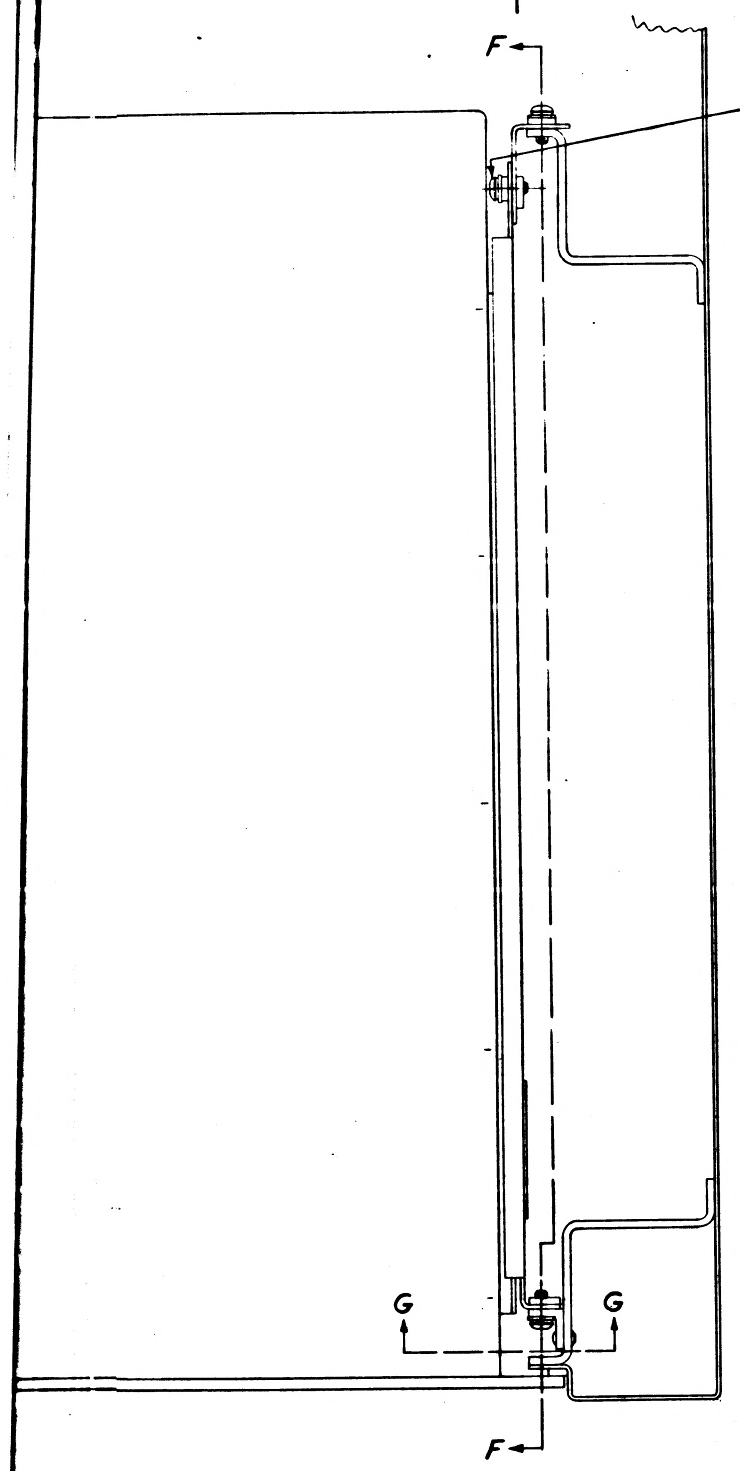
1900004 SH 2

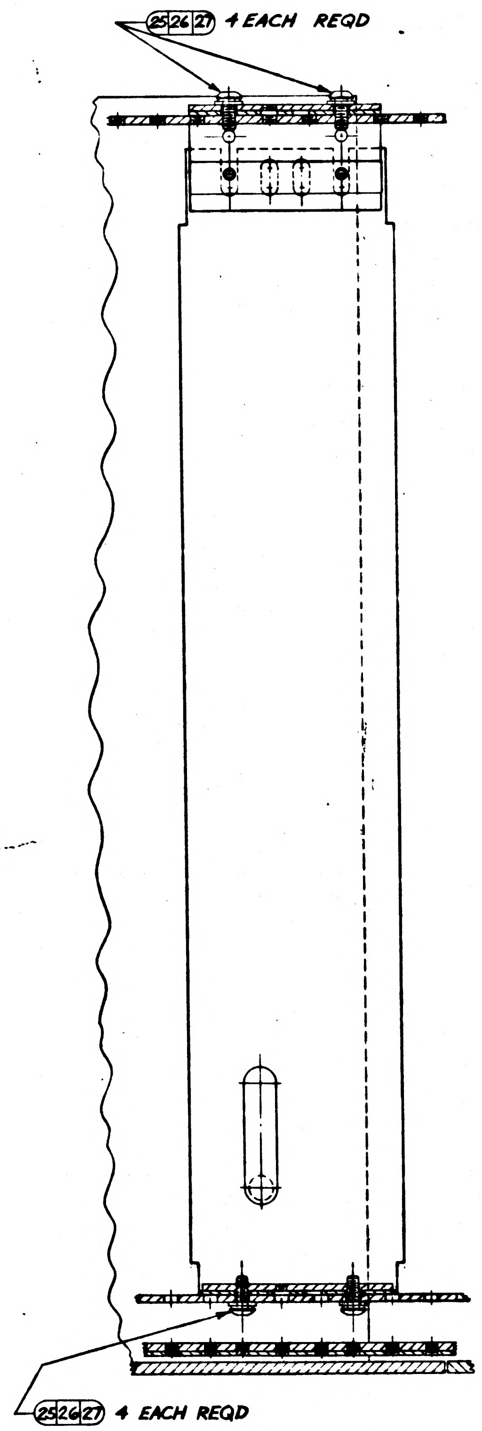
1900004 N

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

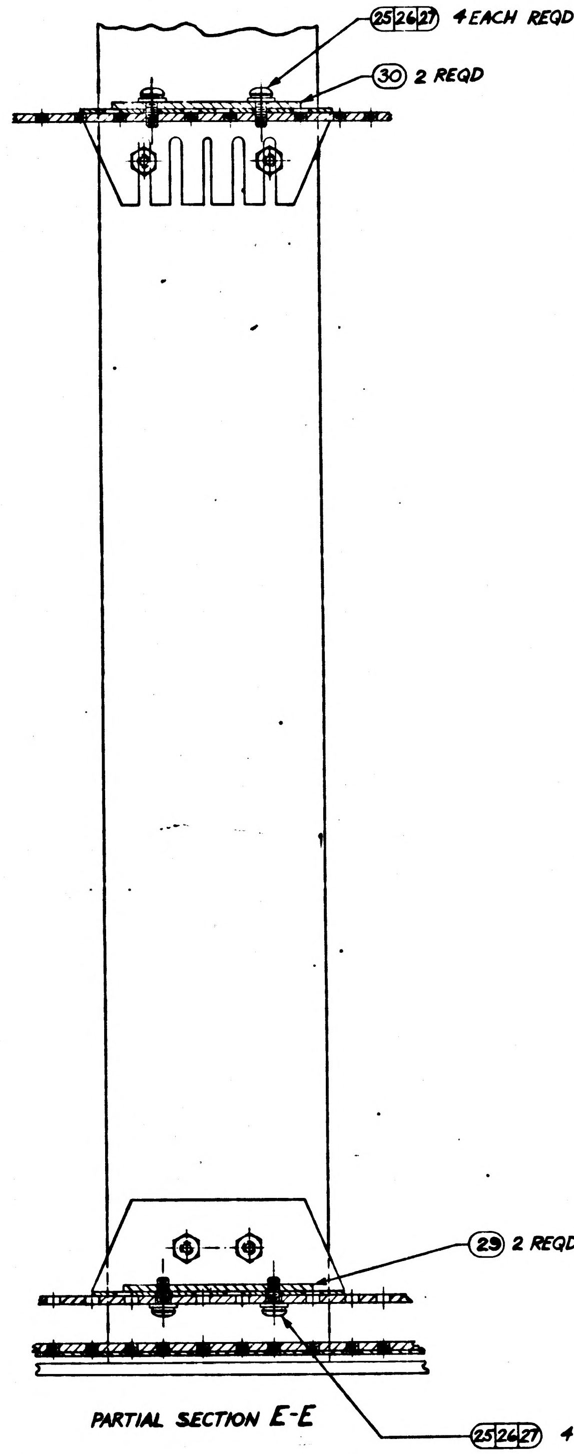
F3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		THIS SHEET ADDED. IN ACCORDANCE WITH CM-19336C PER TDRR		5 -M 64	RJM

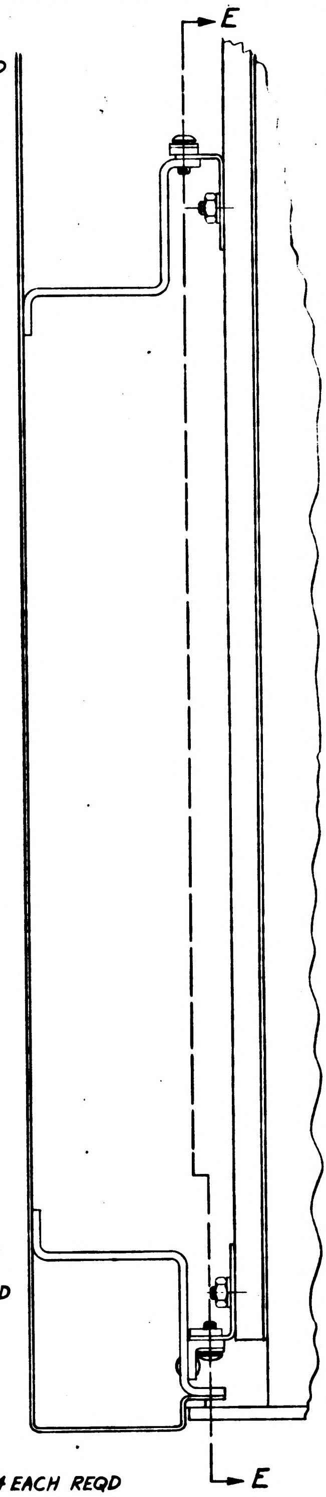




PARTIAL SECTION F-F



PARTIAL SECTION E-E

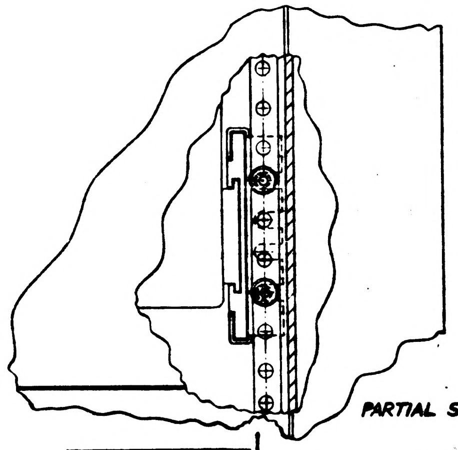


PARTIAL SECTION C-C
SCALE 1/1
FOR MOUNTING PART NO. 1014061 (REF.)
LEFT SIDE SHOWN
RIGHT SIDE SYMMETRICALLY OPPOSITE

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63

Ⓝ THIS SHEET ADDED
Ⓝ REPLACES REV M WITH CHANGE

,⑤,⑥,⑩,⑫,
㉑



PARTIAL SECTION G-G

1900005-011	1900005-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.02 ±.02 ±.005 ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 21 FEB 63
CHECKED A. Udovich 12 NOV 63
APPROVAL 13 Nov 63
APPROVAL Gedman 2/21/64
NASA APPROVAL W. G. 2-25-64
MIT APPROVAL 2/2/64

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HOUSTON, TEXAS

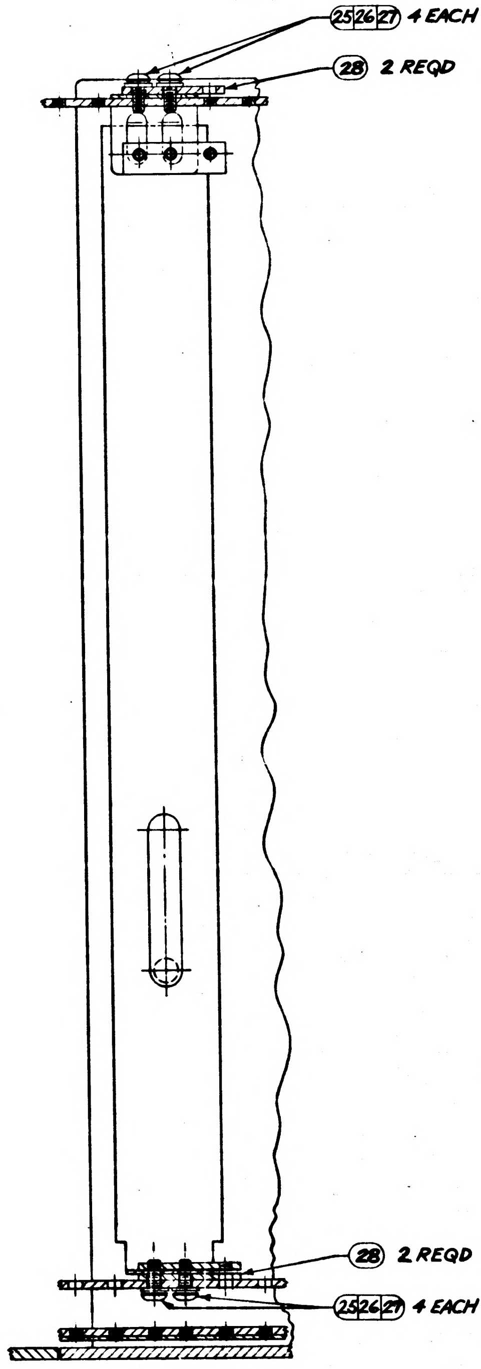
OPTICS - INERTIAL ANALYZER

CODE IDENT NO
SIZE J
1900004
SCALE 1/4
SHEET 2 OF 2

1900004 SH 2

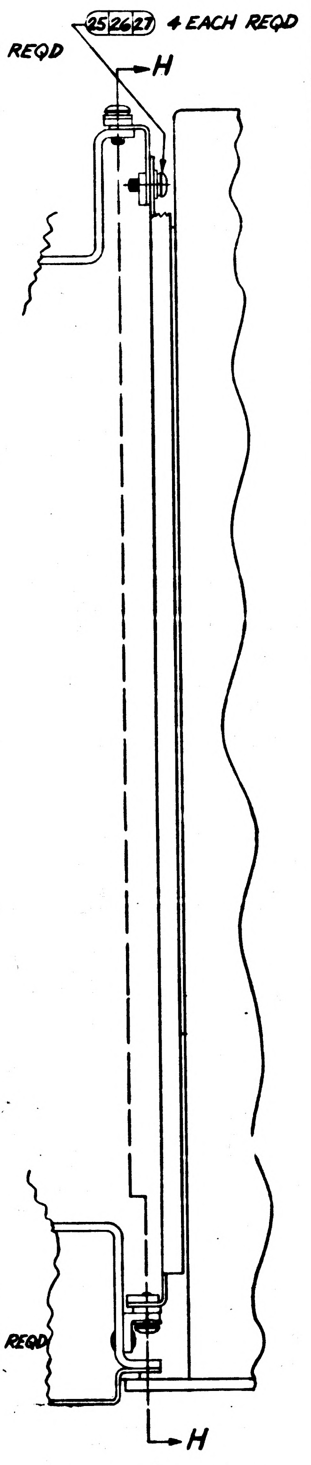
1900004 N

F2



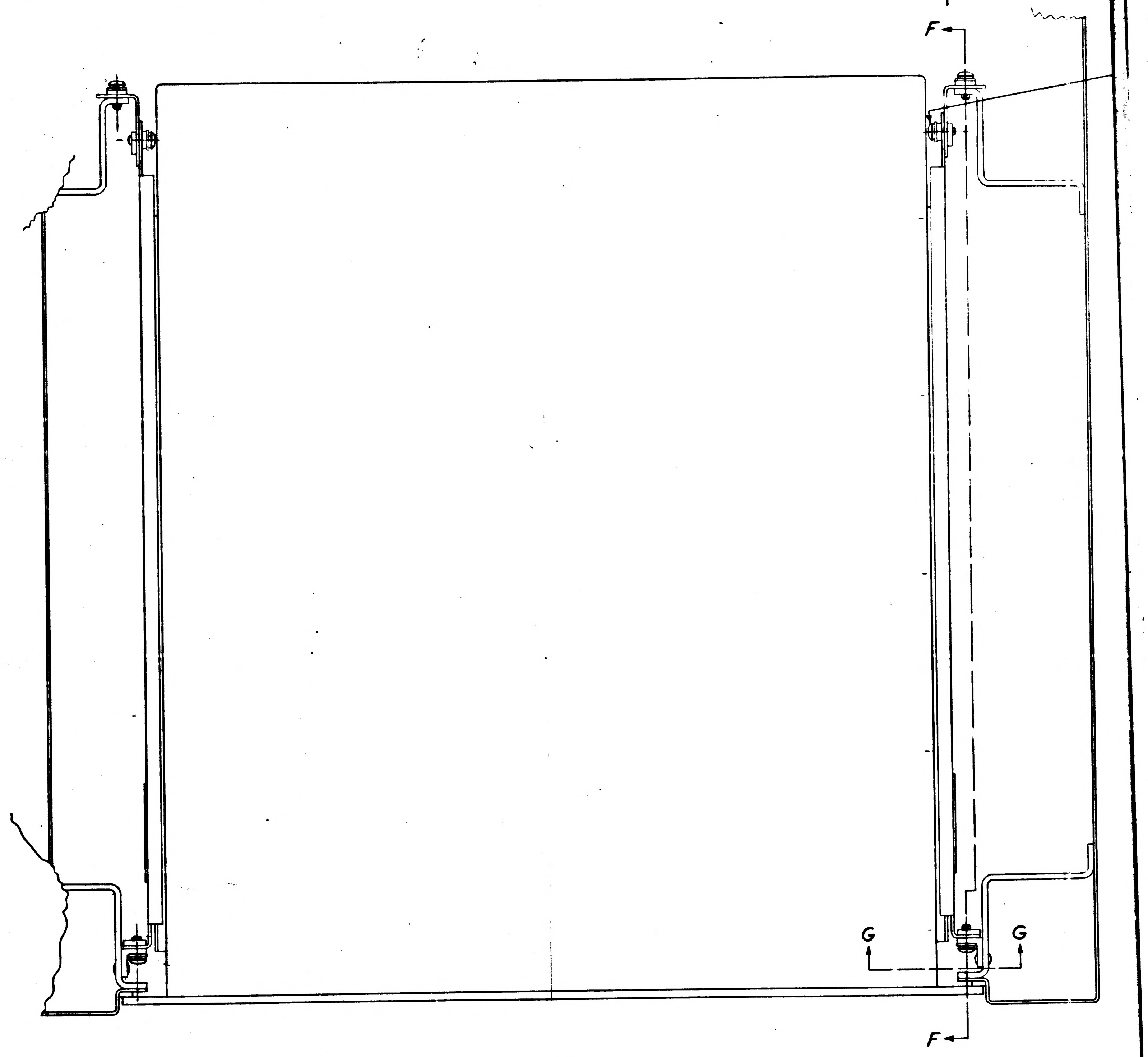
25 26 27 4 EACH REQD
28 2 REQD
28 2 REQD
25 26 27 4 EACH REQD

PARTIAL SECTION H-H

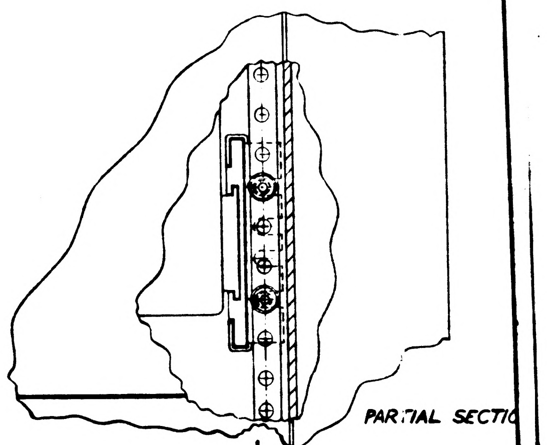


25 26 27 4 EACH REQD
H
H

PARTIAL SECTION A-A
SCALE 1/1
FOR MOUNTING ITEMS ②,
③, ⑦, ⑧, ⑪, ⑰, AND ⑱
LEFT SIDE SHOWN
RIGHT SIDE SYMMETRICALLY OPPOSITE



SECTION B-B
SCALE 1/1
FOR MOUNTING ITEMS ①, ⑤, ⑥, ⑩, ⑫,
⑬, ⑮, ⑯, ⑲, ⑳, AND ㉑

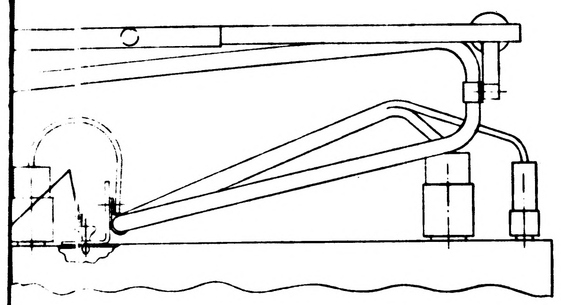


PARTIAL SECTIO

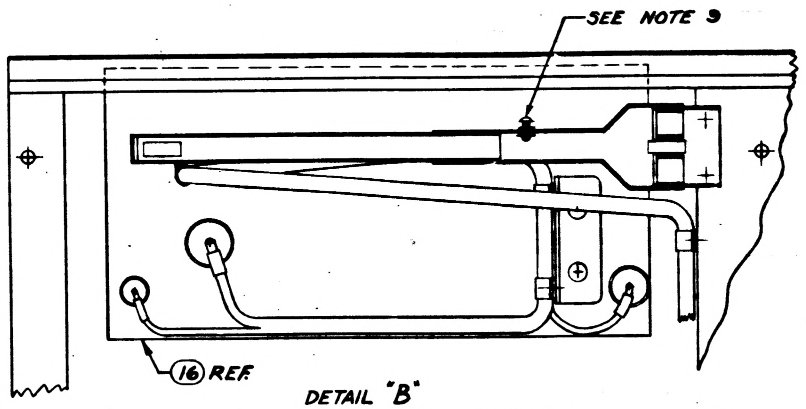
1900004 SH 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REVISION 'M' WITH CHANGE PER CM-193360		8 [illegible] 64	R.J.M.
P		CHANGE IN ACCORDANCE WITH CM194391 PER TDRR 06565		[illegible]	[illegible]



DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION
SIMILAR TO MOST
DRAWER INSTALLATONS



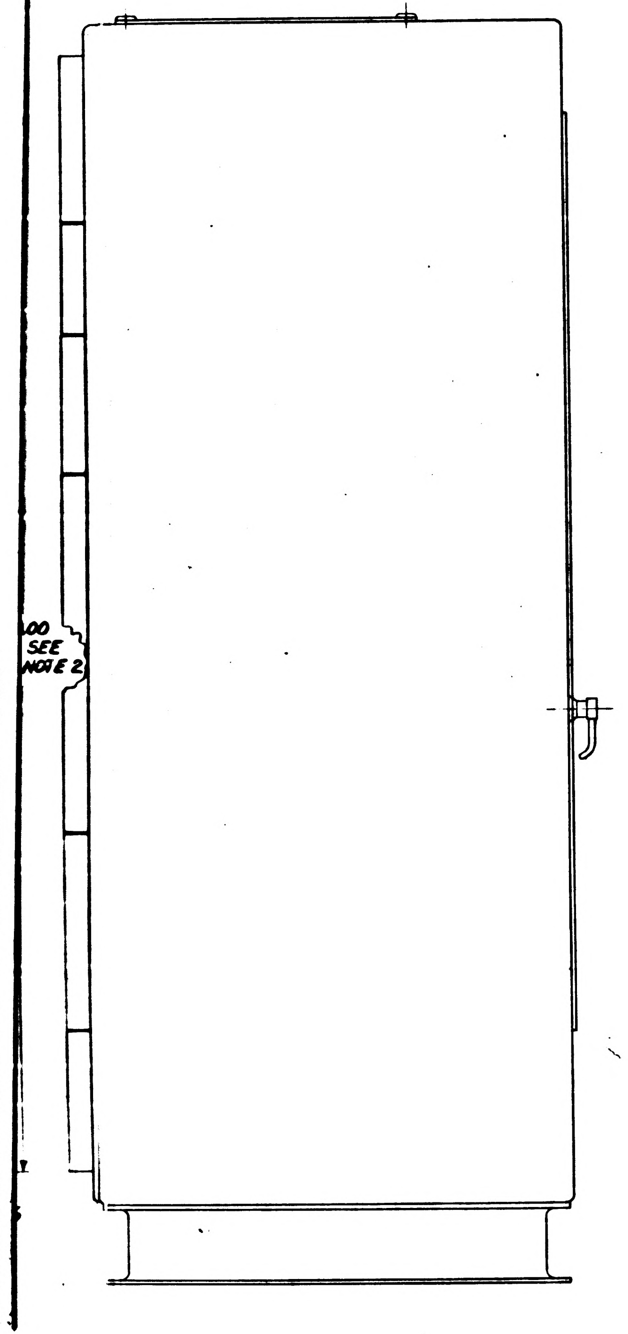
DETAIL "B"
HARNESS ARRANGEMENT FOR
ALL DRAWERS SIMILAR
SCALE 1/2 SEE NOTE 9

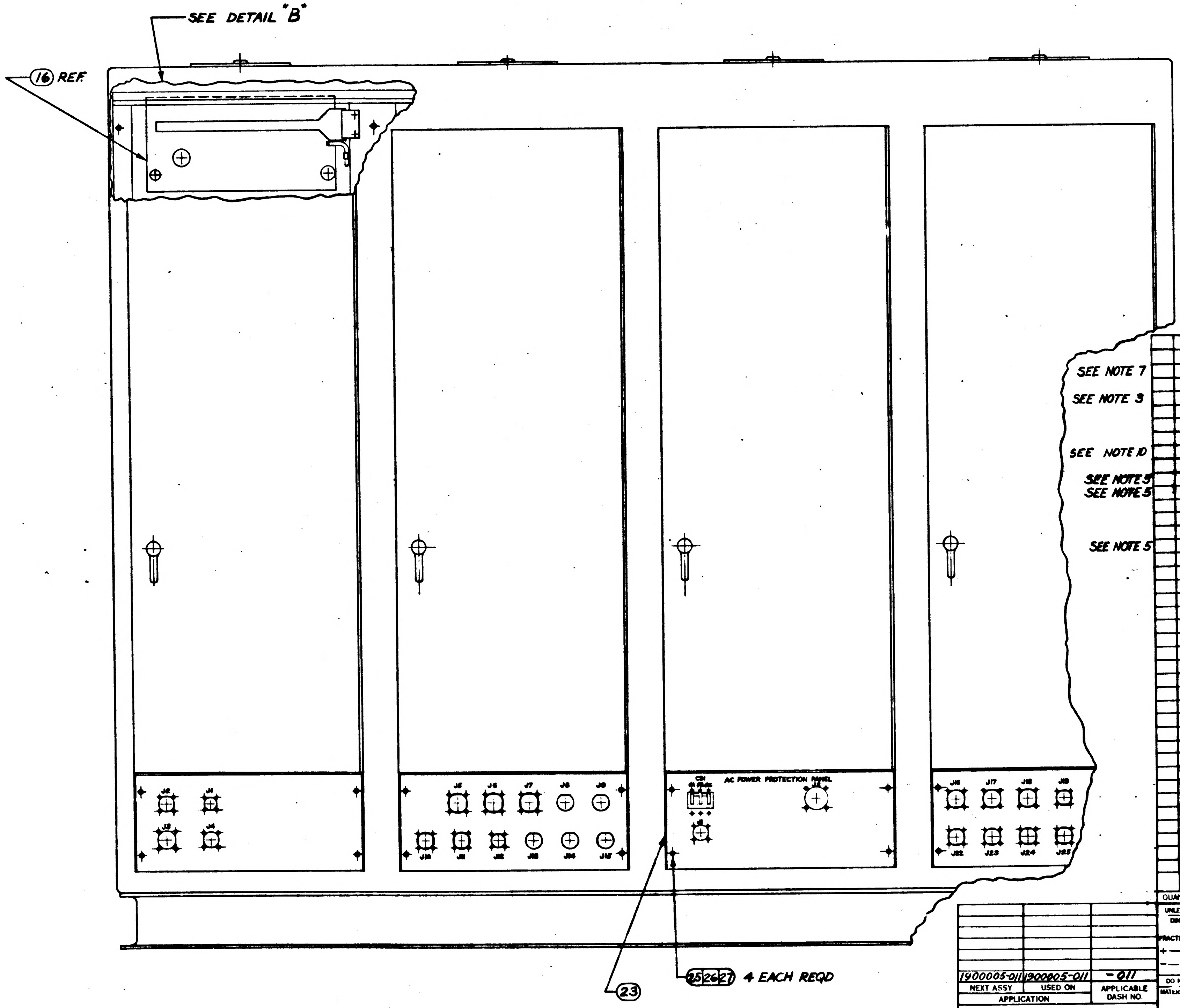
P	N
N	N
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓝ REPLACES REV M WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63





	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		37	1901554-002	GSE SIGNAL SELECTION LIST
				1		36	1901554-001	GSE SIGNAL SELECTION LIST
SEE NOTE 7				X		35	1900016	INSTALLATION DRAWING, O.I.A.
SEE NOTE 3				AR		34	MIL-I-8660	DOW CORNING #4, LUBRICATING GREASE
				4		33	1897109-104	SCREW, DRIVE, ROUND HEAD
SEE NOTE 10				1		32	1901304-201	NAMEPLATE, APOLLO G&N
						31		
SEE NOTE 5				2		30	1015736-001	SPACER, BAR
SEE NOTE 5				2		29	1015730-001	NUT-BAR
				28		28	1900934	SPACER, BAR
				236		27	AN960-C10L	WASHER-FLAT #10
				236		26	MS35338-81	WASHER-LOCK #10
SEE NOTE 5				236		25	1006783-44	SCREW, BUTTON HD.-HEX, SOCKET
						24		
				1		23	1900075-011	PANEL, PROTECTION, A.C. POWER, ASSY
				1		22	1900031-011	CABINET ASSY, ELECTRICAL EQUIP, ASSY
				1		21	1900049-011	POWER SUPPLY, RELAY & LAMP, ASSY
				1		20	1900043-011	GENERATOR, SIGNAL ASSY
				1		19	1900056-011	SELECTOR, SIGNAL, OSCILLOGRAPH, ASSY
				1		18	1900041-011	COUNTER, ASSY
				1		17	1900036-011	VOLTMETER, PHASE ANGLE, ASSY
				1		16	1900042-011	VOLTMETER, DIGITAL, ASSY
				1		15	1900048-011	SWITCH, CROSSBAR ASSY
				1		14	1900166-011	PANEL, COAXIAL DISTRIBUTION, ASSY
				1		13	1900057-011	SELECTOR, SIGNAL, PRIMARY, ASSY
				1		12	1900037-011	OSCILLOSCOPE, DUAL BEAM, ASSY
				1		11	1900035-011	POWER SUPPLY, ELECTRONIC, ASSY
				1		10	1900052-011	RECORDER, DIGITAL, ASSY
				1		9	1900163-011	PHASE SHIFT PANEL ASSY
				1		8	1900082-011	SELECTOR, TEST, ASSY
				1		7	1900059-011	CONTROL, TEST, ASSY
				1		6	1900054-011	CONTROL, GIMBAL POSITION, ASSY
				2		5	1900038-011	OSCILLOSCOPE MONITOR ASSY
				2		4	1900350-011	FAN, CENTRIFUGAL, ASSY
				1		3	1900702-011	POWER SUPPLY & LOAD PANEL ASSY
				1		2	1900058-011	TEMPERATURE MONITOR & CONTROL, ASSY
				1		1	1900055-011	MONITOR PANEL ASSY

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS +.02 −.02, +.005 −.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E.E. Lowe DATE 21 FEB 63
CHECKED A. Ulrich 12 NOV 63
APPROVAL C.C. Stein 13 Nov 63
APPROVAL L. Yeluman 2/6/64
NASA APPROVAL W. J. Blum 2-25-64
MIT APPROVAL [illegible] 2/21/64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

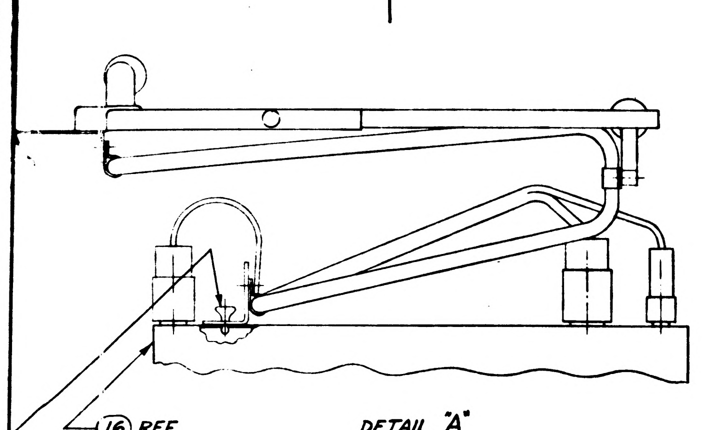
CODE IDENT NO.
SIZE J
1900004
SCALE 1/4
SHEET 1 of 2

1900004 SH 1

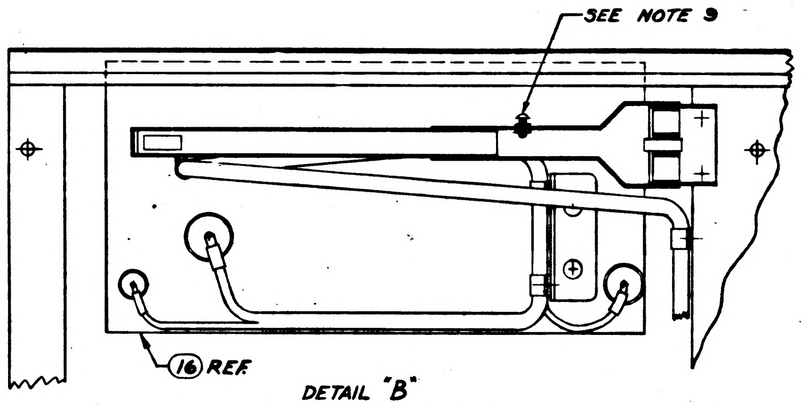
1900004 P

INCHES
PHOTOGRAPHIC SCALE ONLY

E3



DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION
SIMILAR TO MOST
DRAWER INSTALLATONS



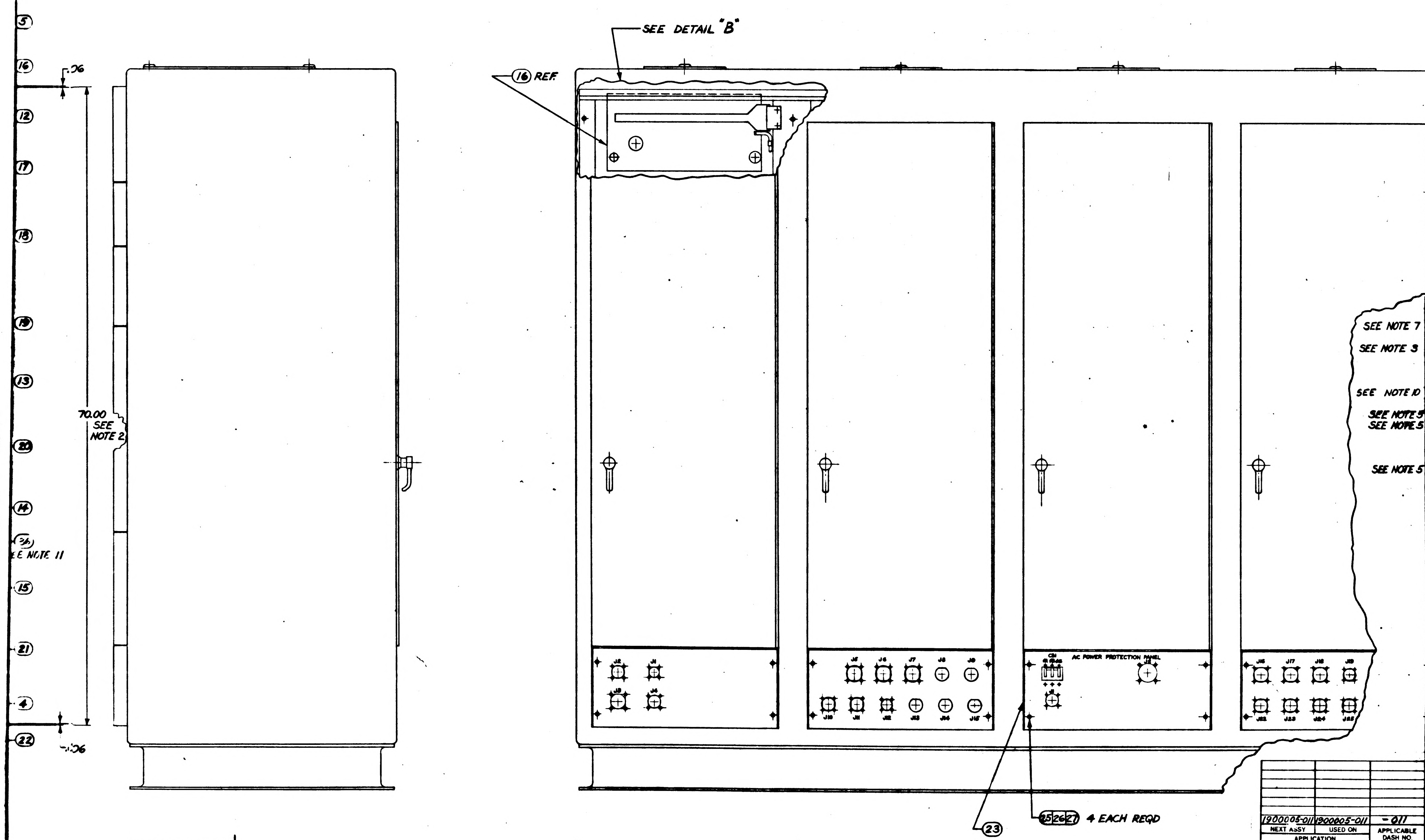
DETAIL "B"
HARNESS ARRANGEMENT FOR
ALL DRAWERS SIMILAR
SCALE 1/2 SEE NOTE 9

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER CM-193360			RJM
P		CHANGE IN ACCORDANCE WITH CM 194391 PER TDR			

P	N
N	N
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓝ REPLACES REV M WITH CHANGE

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63



	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		37	1901554-002	GSE SIGNAL SELECTION LIST
				1		36	1901554-001	GSE SIGNAL SELECTION LIST
SEE NOTE 7				X		35	1900016	INSTALLATION DRAWING, O.I.A.
SEE NOTE 3				AR		34	MIL-I-8660	DOW CORNING #4, LUBRICATING GREASE
				4		33	1897109-104	SCREW, DRIVE, ROUND HEAD
SEE NOTE 10				1		32	1901304-201	NAMEPLATE, APOLLO G&N
						31		
SEE NOTE 5				2		30	1015796-001	SPACER, BAR
SEE NOTE 5				2		29	1015790-001	NUT-BAR
				28		28	1900934	SPACER, BAR
				236		27	AN960-C10L	WASHER-FLAT #10
				236		26	MS35338-81	WASHER-LOCK #10
SEE NOTE 5				236		25	1006783-44	SCREW, BUTTON HD.-HEX, SOCKET
						24		
				1		23	1900075-011	PANEL, PROTECTION, A.C. POWER, ASSY
				1		22	1900031-011	CABINET ASSY, ELECTRICAL EQUIP, ASSY
				1		21	1900049-011	POWER SUPPLY, RELAY & LAMP, ASSY
				1		20	1900043-011	GENERATOR, SIGNAL ASSY
				1		19	1900056-011	SELECTOR, SIGNAL, OSCILLOGRAPH, ASSY
				1		18	1900041-011	COUNTER, ASSY
				1		17	1900036-011	VOLTMETER, PHASE ANGLE, ASSY
				1		16	1900042-011	VOLTMETER, DIGITAL, ASSY
				1		15	1900048-011	SWITCH, [illegible]
				1		14	1900166-011	PANEL, COAXIAL DISTRIBUTION, ASSY
				1		13	1900057-011	SELECTOR, SIGNAL, PRIMARY ASSY
				1		12	1900037-011	OSCILLOSCOPE, DUAL BEAM ASSY
				1		11	1900035-011	POWER SUPPLY, ELECTRONIC, ASSY
				1		10	1900052-011	RECORDER, DIGITAL, ASSY
				1		9	1900163-011	PHASE SHIFT PANEL ASSY
				1		8	1900082-011	SELECTOR, TEST, ASSY
				1		7	1900059-011	CONTROL, TEST, ASSY
				1		6	1900054-011	CONTROL, GIMBAL [illegible] ASSY
				2		5	1900038-011	OSCILLOSCOPE MONITOR ASSY
				2		4	1900350-011	FAN, CENTRIFUGAL, ASSY
				1		3	1900702-011	POWER SUPPLY & LOAD PANEL ASSY
				1		2	1900058-011	TEMPERATURE [illegible] ASSY
				1		1	1900055-011	MONITOR PANEL ASSY

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± —	±.02	± —
— —	+.005 -.005	— —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 21 FEB 63
CHECKED 12 NOV 63
APPROVAL 13 Nov 63
APPROVAL
NASA APPROVAL W. G. 3-25-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO. | SIZE J | 1900004
SCALE 1/4 | SHEET 1 OF 2

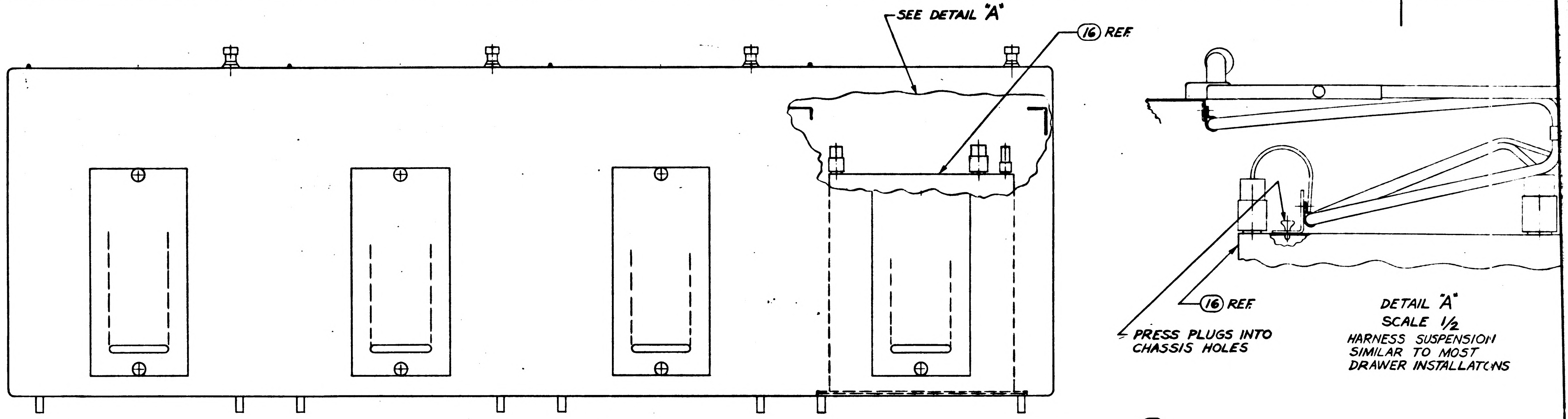
1900004 SH 1

1900004 P

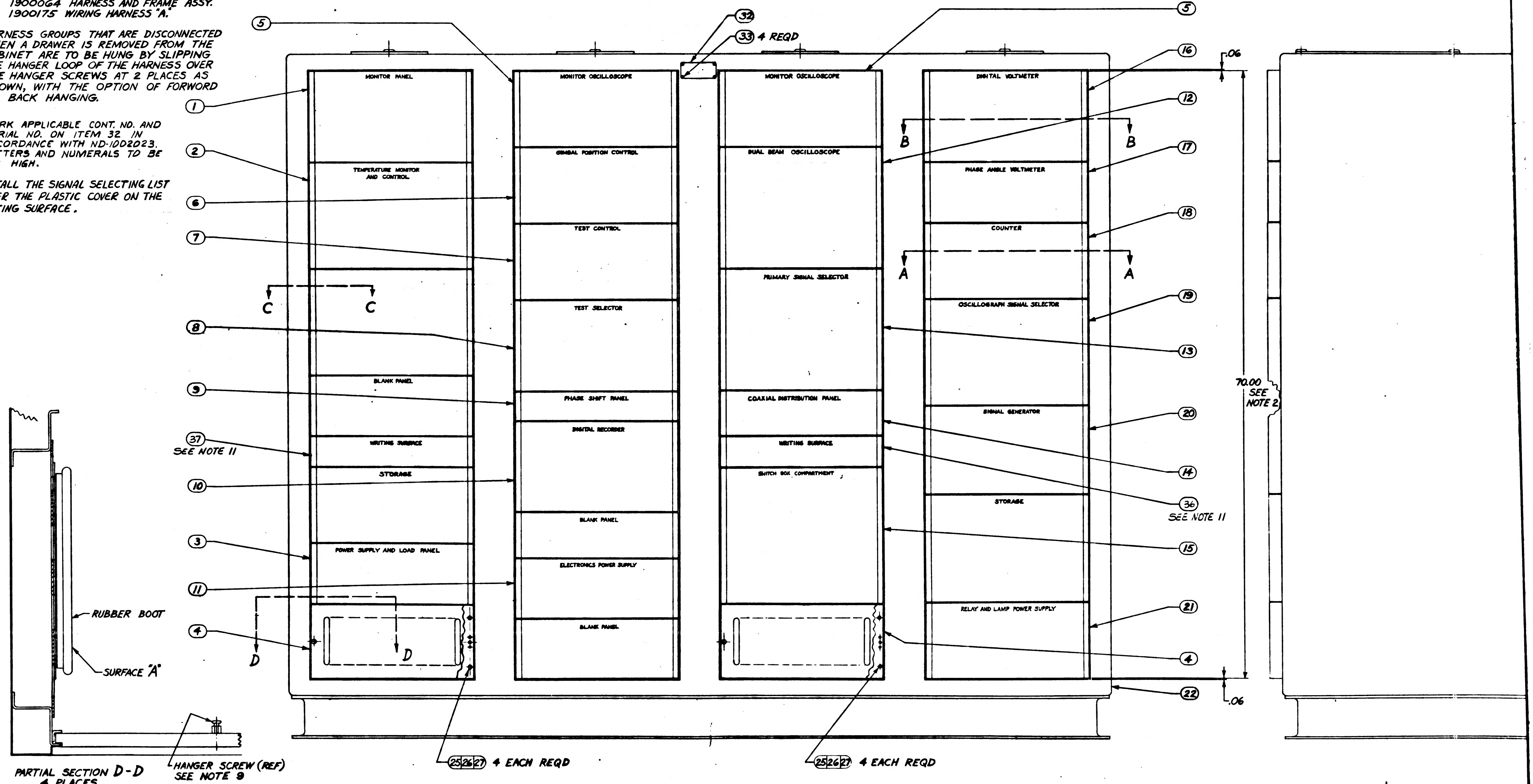
INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SPACING BETWEEN FRONT PANELS IN EACH VERTICAL ROW IS TO BE BALANCED THRU DIMENSION SHOWN. A MINIMUM SPACING OF .030 IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
3. APPLY ITEM ㉞ TO SURFACE "A".
4. APPLY TIGHTENING TORQUE TO SCREWS AS FOLLOWS:
   110. 10-32 - 37 TO 40 IN. LBS.
5. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
6. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
7. BEFORE AND AFTER DRAWER INSTALLATION CONSOLE MUST BE FIRMLY ATTACHED TO A RIGID FLOOR TO INSURE PERSONNEL AND EQUIPMENT SAFETY. SEE ITEM ㉟
8. REFERENCE DRAWINGS:
   1900064 HARNESS AND FRAME ASSY.
   1900175 WIRING HARNESS "A."
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS AT 2 PLACES AS SHOWN, WITH THE OPTION OF FORWORD OR BACK HANGING.
10. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 32 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
11. INSTALL THE SIGNAL SELECTING LIST UNDER THE PLASTIC COVER ON THE WRITING SURFACE.


SEE DETAIL "A"
⑯ REF
⑯ REF
PRESS PLUGS INTO CHASSIS HOLES

DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION SIMILAR TO MOST DRAWER INSTALLATONS

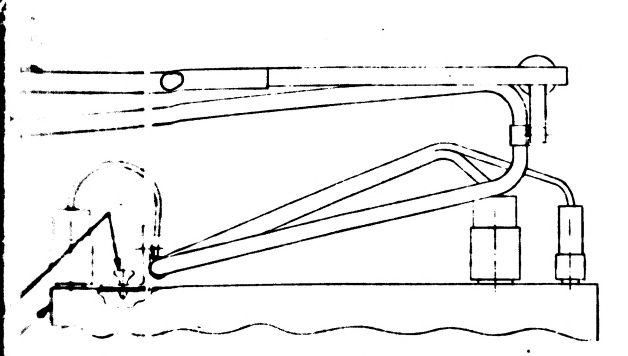

⑤
⑤
㉜
㉝ 4 REQD
MONITOR PANEL
TEMPERATURE MONITOR AND CONTROL
BLANK PANEL
WRITING SURFACE
STORAGE
POWER SUPPLY AND LOAD PANEL
MONITOR OSCILLOSCOPE
GIMBAL POSITION CONTROL
TEST CONTROL
TEST SELECTOR
PHASE SHIFT PANEL
DIGITAL RECORDER
BLANK PANEL
ELECTRONICS POWER SUPPLY
BLANK PANEL
MONITOR OSCILLOSCOPE
DUAL BEAM OSCILLOSCOPE
PRIMARY SIGNAL SELECTOR
COAXIAL DISTRIBUTION PANEL
WRITING SURFACE
SWITCH BOX COMPARTMENT
DIGITAL VOLTMETER
PHASE ANGLE VOLTMETER
COUNTER
OSCILLOGRAPH SIGNAL SELECTOR
SIGNAL GENERATOR
STORAGE
RELAY AND LAMP POWER SUPPLY
①
②
⑥
⑦
⑧
⑨
㊲ SEE NOTE 11
⑩
③
⑪
④
⑯
⑫
⑰
⑱
⑲
⑬
⑳
⑭
㊱ SEE NOTE 11
⑮
㉑
④
㉒
B B
A A
C C
D D
.06
70.00 SEE NOTE 2
.06
㉕㉖㉗ 4 EACH REQD
㉕㉖㉗ 4 EACH REQD
RUBBER BOOT
SURFACE "A"
HANGER SCREW (REF) SEE NOTE 9

PARTIAL SECTION D-D
4 PLACES
SCALE 1/2

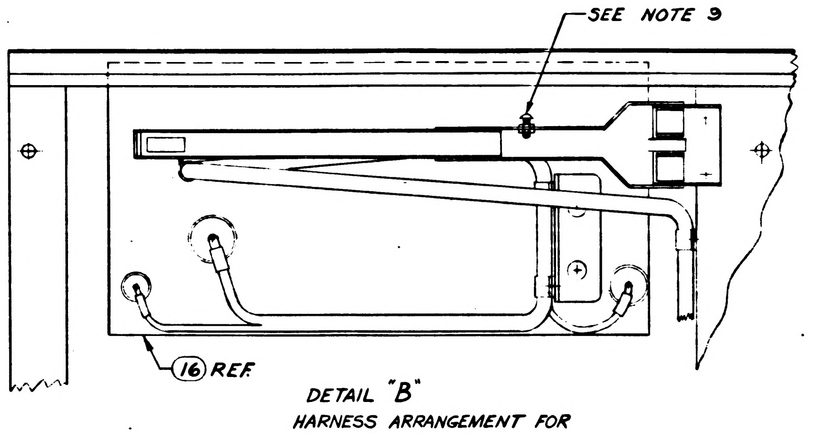
1900004

INCHES 0 1 2 PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REVISION "M" WITH CHANGE PER CM-193360		5 JAN 64	RJM
P		CHANGE IN ACCORDANCE WITH CM 194391 PER TDRR 06565		2 FEB 64	JAC
R		CHANGE IN ACCORDANCE WITH CM 195131 08158		10 MAR 64	L.S. EF
S	-	CHANGE IN ACCORDANCE WITH CM-195804 08159	—	18 MAR 64	MEM
T	-	CHANGE IN ACCORDANCE WITH CM 195956 08160	—	27 MAR 64	EM



DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION
SIMILAR TO MOST
DRAWER INSTALLATONS



DETAIL "B"
HARNESS ARRANGEMENT FOR
ALL DRAWERS SIMILAR
SCALE 1/2 SEE NOTE 9

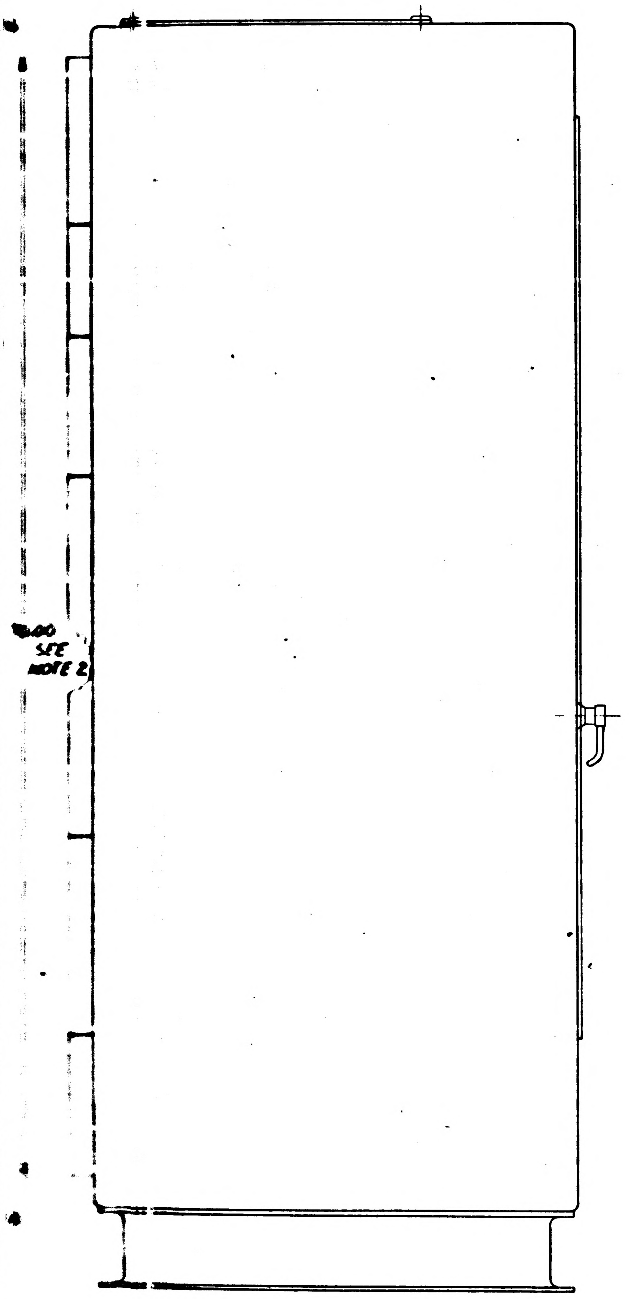
T	N
S	N
R	N
P	N
N	N
SHEET 1	SHEET 2

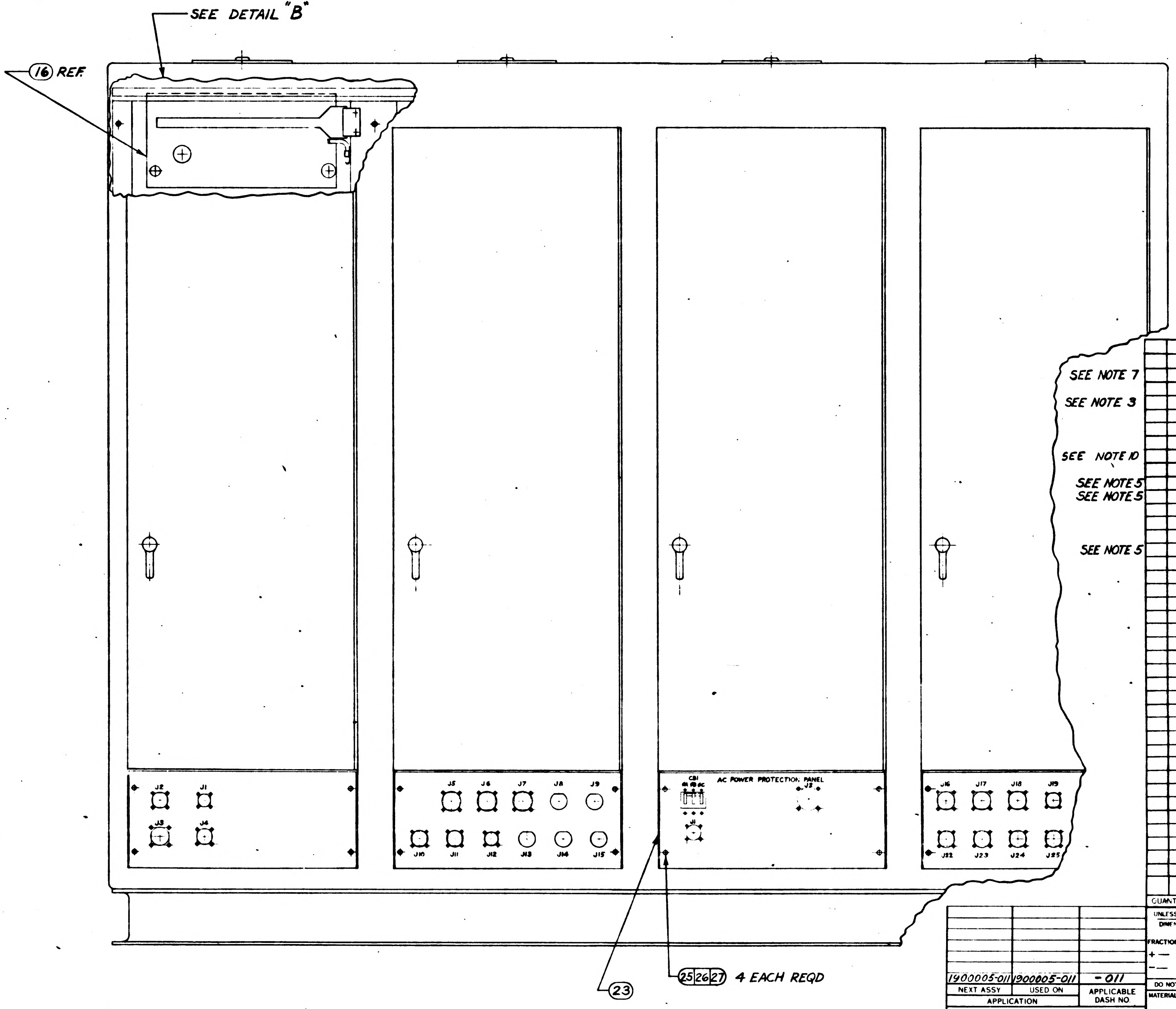
REVISION STATUS OF SHEETS

Ⓝ REPLACES REV M WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 18 MAR 63





				1		37	1901554-002	GSE SIGNAL SELECTION LIST
				1		36	1901554-001	GSE SIGNAL SELECTION LIST
SEE NOTE 7				X		35	1900016	INSTALLATION DRAWING, O.I.A.
SEE NOTE 3				AR		34	MIL-I-8660	DOW CORNING #4, LUBRICATING GREASE
				4		33	1897109-104	SCREW, DRIVE, ROUND HEAD
SEE NOTE 10				1		32	1901304-201	NAMEPLATE, APOLLO G&N
						31		
SEE NOTE 5				2		30	1015796-001	SPACER, BAR
SEE NOTE 5				2		29	1015790-001	NUT-BAR
				28		28	1900934	SPACER, BAR
				236		27	AN960-C10L	WASHER-FLAT #10
				236		26	MS35338-81	WASHER-LOCK #10
SEE NOTE 5				236		25	1006783-44	SCREW, BUTTON HD.-HEX, SOCKET
						24		
				1		23	1900075-011	PANEL, PROTECTION, A.C. POWER, ASSY
				1		22	1900031-011	CABINET ASSY, ELECTRICAL EQUIP, ASSY
				1		21	1900049-011	POWER SUPPLY, RELAY & LAMP, ASSY
				1		20	1900043-011	GENERATOR, SIGNAL ASSY
				1		19	1900056-011	SELECTOR, SIGNAL, OSCILLOGRAPH, ASSY
				1		18	1900041-011	COUNTER, ASSY
				1		17	1900036-011	VOLTMETER, PHASE ANGLE, ASSY
				1		16	1900042-011	VOLTMETER, DIGITAL, ASSY
				1		15	1900048-011	SWITCH, CROSSBAR, ASSY
				1		14	1900166-011	PANEL, COAXIAL DISTRIBUTION, ASSY
				1		13	1900057-011	SELECTOR, SIGNAL, PRIMARY, ASSY
				1		12	1900037-011	OSCILLOSCOPE, DUAL BEAM, ASSY
				1		11	1900035-011	POWER SUPPLY, ELECTRONIC, ASSY
				1		10	1900052-011	RECORDER, DIGITAL, ASSY
				1		9	1900163-011	PHASE SHIFT PANEL ASSY
				1		8	1900082-011	SELECTOR, TEST, ASSY
				1		7	1900059-011	CONTROL, TEST, ASSY
				1		6	1900054-011	CONTROL, GIMBAL POSITION, ASSY
				2		5	1900038-011	OSCILLOSCOPE MONITOR ASSY
				2		4	1900350-011	FAN, CENTRIFUGAL, ASSY
				1		3	1900702-011	POWER SUPPLY & LOAD PANEL ASSY
				1		2	1900058-011	TEMPERATURE MONITOR & CONTROL, ASSY
				1		1	1900055-011	MONITOR PANEL ASSY
				011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900005-011	1900005-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+—	±.02 ±.02	+—
——	+.005 -.005	——

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E.C. Jones DATE 21 FEB 63
CHECKED A. Ulorich 12 NOV 63
APPROVAL 13 Nov 63
APPROVAL 2/6/64
NASA APPROVAL W. J. 2-25-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO.
SIZE J
1900004

SCALE 1/4
SHEET 1 OF 2

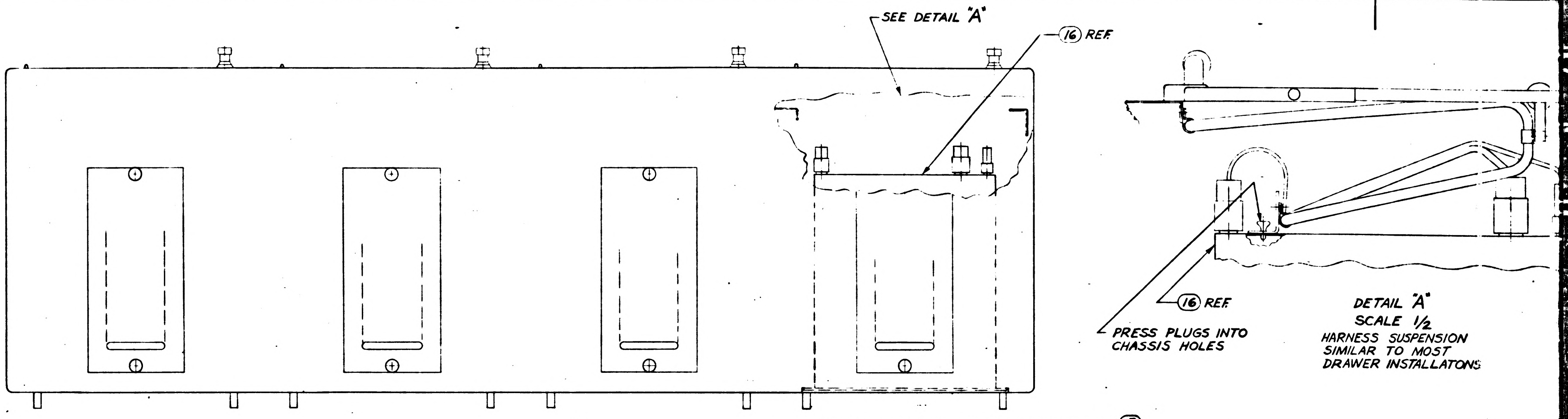
19C0004 SH 1

1900004 T

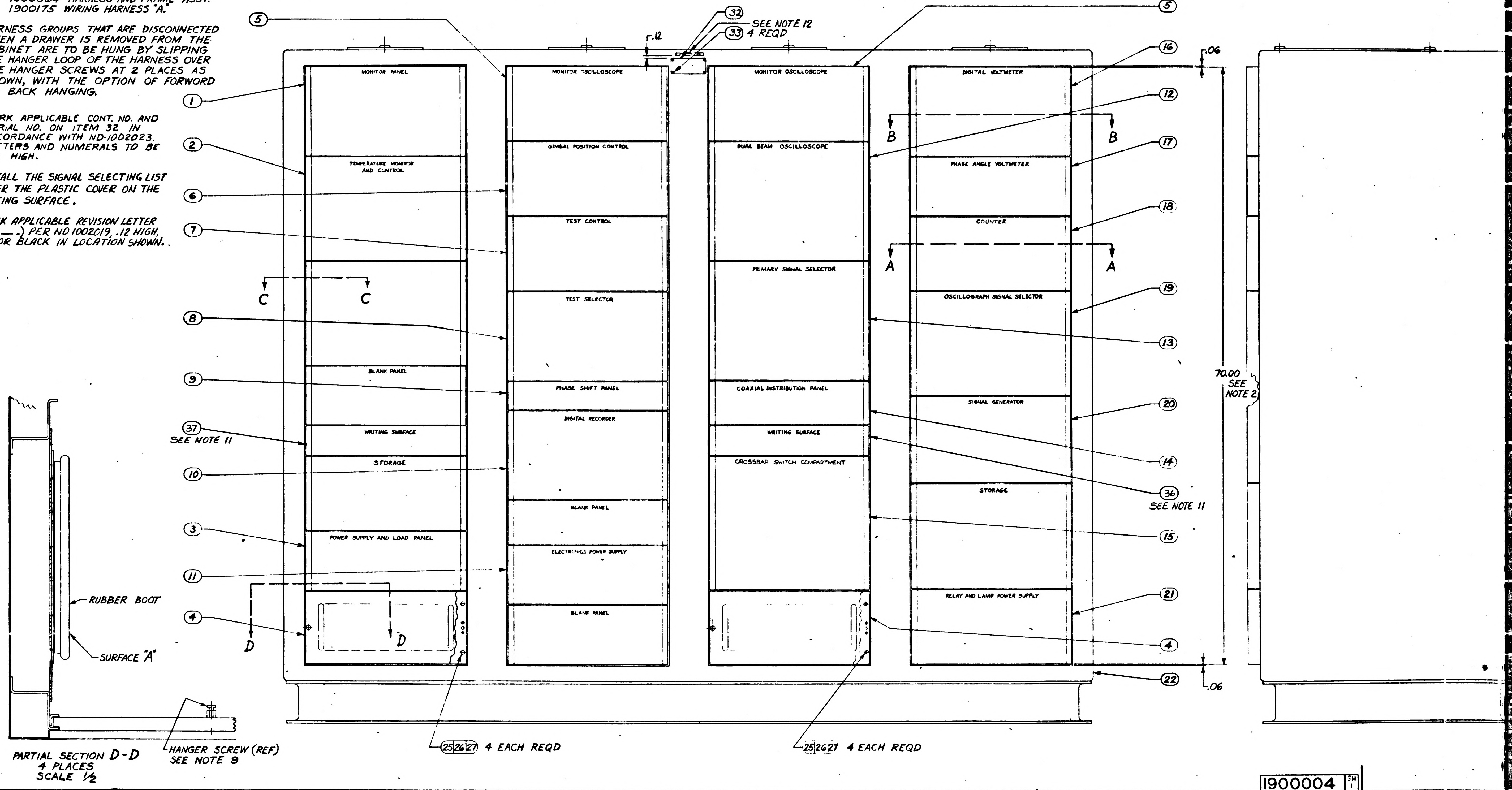
27 1900004

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SPACING BETWEEN FRONT PANELS IN EACH VERTICAL ROW IS TO BE BALANCED THRU DIMENSION SHOWN. A MINIMUM SPACING OF .030 IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
3. APPLY ITEM ㉞ TO SURFACE "A".
4. APPLY TIGHTENING TORQUE TO SCREWS AS FOLLOWS:
   NO. 10-32 - 37 TO 40 IN. LBS.
5. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
6. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
7. BEFORE AND AFTER DRAWER INSTALLATION CONSOLE MUST BE ATTACHED TO THE FLOOR TO INSURE PERSONNEL AND EQUIPMENT SAFETY. SEE ITEM ㉟
8. REFERENCE DRAWINGS:
   1900064 HARNESS AND FRAME ASSY.
   1900175 WIRING HARNESS "A."
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS AT 2 PLACES AS SHOWN, WITH THE OPTION OF FORWORD OR BACK HANGING.
10. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 32 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
11. INSTALL THE SIGNAL SELECTING LIST UNDER THE PLASTIC COVER ON THE WRITING SURFACE.
12. MARK APPLICABLE REVISION LETTER (REV__.) PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.



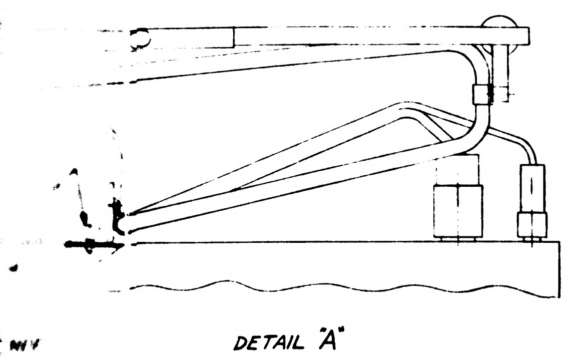
SEE DETAIL "A"
⑯ REF
⑯ REF
PRESS PLUGS INTO CHASSIS HOLES
DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION SIMILAR TO MOST DRAWER INSTALLATONS

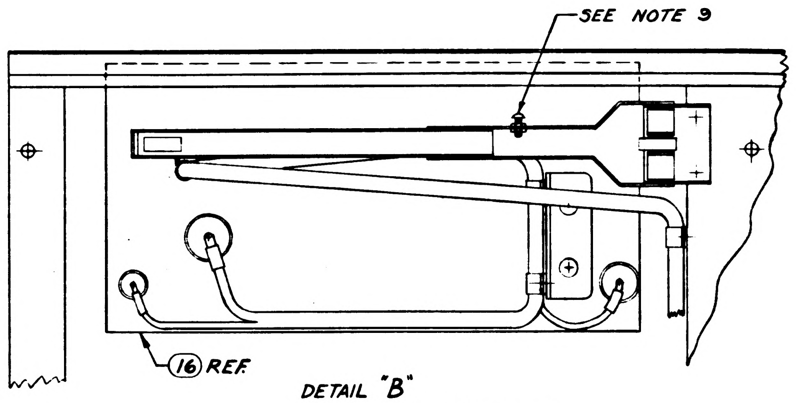


⑤
⑤
㉜
SEE NOTE 12
㉝ 4 REQD
.12
MONITOR PANEL
TEMPERATURE MONITOR AND CONTROL
BLANK PANEL
WRITING SURFACE
STORAGE
POWER SUPPLY AND LOAD PANEL
MONITOR OSCILLOSCOPE
GIMBAL POSITION CONTROL
TEST CONTROL
TEST SELECTOR
PHASE SHIFT PANEL
DIGITAL RECORDER
BLANK PANEL
ELECTRONICS POWER SUPPLY
BLANK PANEL
MONITOR OSCILLOSCOPE
DUAL BEAM OSCILLOSCOPE
PRIMARY SIGNAL SELECTOR
COAXIAL DISTRIBUTION PANEL
WRITING SURFACE
CROSSBAR SWITCH COMPARTMENT
DIGITAL VOLTMETER
PHASE ANGLE VOLTMETER
COUNTER
OSCILLOGRAPH SIGNAL SELECTOR
SIGNAL GENERATOR
STORAGE
RELAY AND LAMP POWER SUPPLY
①
②
⑥
⑦
C
C
⑧
⑨
㊲ SEE NOTE 11
⑩
③
⑪
④
D
D
B
B
A
A
⑯
⑫
⑰
⑱
⑲
⑬
⑳
⑭
㊱ SEE NOTE 11
⑮
㉑
④
㉒
.06
.06
70.00 SEE NOTE 2
㉕㉖㉗ 4 EACH REQD
㉕㉖㉗ 4 EACH REQD
RUBBER BOOT
SURFACE "A"
HANGER SCREW (REF) SEE NOTE 9
PARTIAL SECTION D-D
4 PLACES
SCALE 1/2

1900004 SH 1

1/1900004


DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION
SIMILAR TO MOST
DRAWER INSTALLATONS

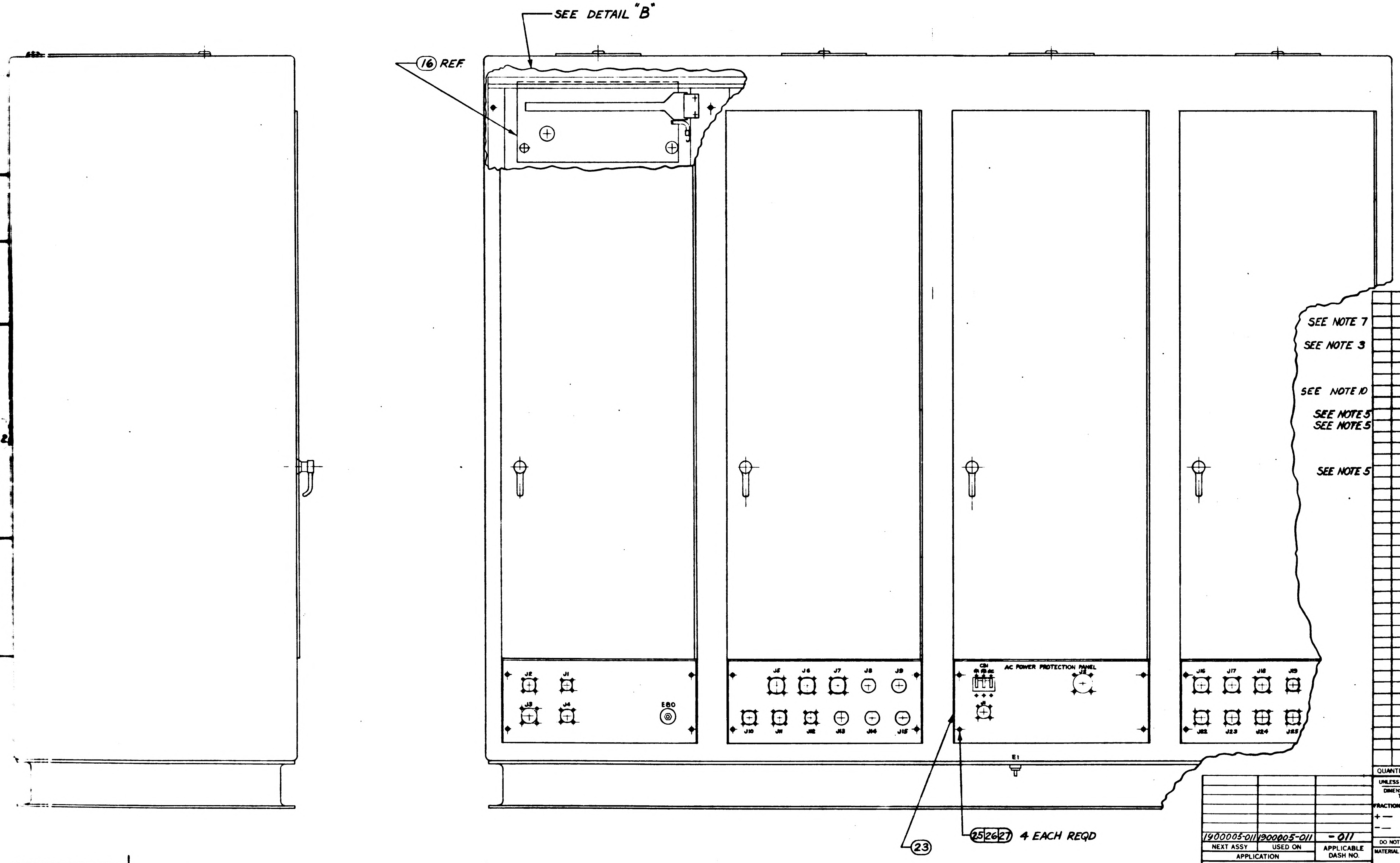

SEE NOTE 9
16 REF.
DETAIL "B"
HARNESS ARRANGEMENT FOR
ALL DRAWERS SIMILAR
SCALE 1/2 SEE NOTE 9

SHEET 1	SHEET 2
U	N
T	N
S	N
R	N
P	N
N	N

REVISION STATUS OF SHEETS

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REVISION "M" WITH CHANGE PER CM-193360		5 JAN 64	RJM
P		CHANGE IN ACCORDANCE WITH CM 194391 PER TDRR 00565		3 FEB 64	
R		CHANGE IN ACCORDANCE WITH CM 195131 PER TDRR 01.58		16 MAR 64	L.S.
S	–	CHANGE IN ACCORDANCE WITH CM-195804 PER TDRR 08159	—	8 MAR 64	
T	–	CHANGE IN ACCORDANCE WITH CM 195956 PER TDRR 08160	—	27 MAR 64	EM
U	–	CHANGE IN ACCORDANCE WITH CM 197465 REVISED PER TDR 10218		11 MAY 64	RS GG


SEE DETAIL "B"
16 REF.
J2
J1
J3
J4
E80
J5
J6
J7
J8
J9
J10
J11
J12
J13
J14
J15
CB1
AC POWER PROTECTION PANEL
J16
J17
J18
J19
J22
J23
J24
J25
E1
23
25 26 27 4 EACH REQD

Ⓝ REPLACES REV M WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63

					011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
					1		37	1901554-002	GSE SIGNAL SELECTION LIST
					1		36	1901554-001	GSE SIGNAL SELECTION LIST
SEE NOTE 7					X		35	1900016	INSTALLATION DRAWING, O.I.A.
SEE NOTE 3					AR		34	MIL-I-8660	DOW CORNING #4, LUBRICATING GREASE
					4		33	1897109-104	SCREW, DRIVE, ROUND HEAD
SEE NOTE 10					1		32	1901304-201	NAMEPLATE, APOLLO G&N
							31		
SEE NOTE 5					2		30	1015796-001	SPACER, BAR
SEE NOTE 5					2		29	1015790-001	NUT-BAR
					28		28	1900934	SPACER, BAR
					236		27	AN960-C10L	WASHER-FLAT #10
					236		26	MS35338-81	WASHER-LOCK #10
SEE NOTE 5					236		25	1006783-44	SCREW, BUTTON HD.-HEX, SOCKET
							24		
					1		23	1900075-011	PANEL, PROTECTION, A.C. POWER, ASSY
					1		22	1900031-011	CABINET ASSY, ELECTRICAL EQUIP, ASSY
					1		21	1900049-011	POWER SUPPLY, RELAY & LAMP, ASSY
					1		20	1900043-011	GENERATOR, SIGNAL ASSY
					1		19	1900056-011	SELECTOR, SIGNAL, OSCILLOGRAPH, ASSY
					1		18	1900041-011	COUNTER, ASSY
					1		17	1900036-011	VOLTMETER, PHASE ANGLE, ASSY
					1		16	1900042-011	VOLTMETER, DIGITAL, ASSY
					1		15	1900048-011	SWITCH, CROSSBAR ASSY
					1		14	1900166-011	PANEL, COAXIAL DISTRIBUTION, ASSY
					1		13	1900057-011	SELECTOR, SIGNAL, PRIMARY, ASSY
					1		12	1900037-011	OSCILLOSCOPE, DUAL BEAM, ASSY
					1		11	1900035-011	POWER SUPPLY, ELECTRONIC, ASSY
					1		10	1900052-011	RECORDER, DIGITAL, ASSY
					1		9	1900163-011	PHASE SHIFT PANEL ASSY
					1		8	1900082-011	SELECTOR, TEST, ASSY
					1		7	1900059-011	CONTROL, TEST, ASSY
					1		6	1900054-011	CONTROL, GIMBAL POSITION, ASSY
					2		5	1900038-011	OSCILLOSCOPE MONITOR ASSY
					2		4	1900350-011	FAN, CENTRIFUGAL, ASSY
					1		3	1900702-011	POWER SUPPLY & LOAD PANEL ASSY
					1		2	1900058-011	TEMPERATURE MONITOR & CONTROL, ASSY
					1		1	1900055-011	MONITOR PANEL ASSY

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS ±.02 ±.02 +.005 −.005
ANGLES + — − —
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

DRAWN E.E. Jones DATE 21 FEB 63
CHECKED L. Uhrich 12 NOV 63
APPROVAL 13 Nov 63
APPROVAL
NASA APPROVAL W. J. 2-25-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO.
SIZE J
1900004
SCALE 1/4
SHEET 1 OF 2

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. SPACING BETWEEN FRONT PANELS IN EACH VERTICAL ROW IS TO BE BALANCED THRU DIMENSION SHOWN. A MINIMUM SPACING OF .030 IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.

3. APPLY ITEM ㉞ TO SURFACE "A".

4. APPLY TIGHTENING TORQUE TO SCREWS AS FOLLOWS:
   110. 10-32 - 37 TO 40 IN. LBS.

5. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.

6. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.

7. BEFORE AND AFTER DRAWER INSTALLATION CONSOLE MUST BE ATTACHED TO THE FLOOR TO INSURE PERSONNEL AND EQUIPMENT SAFETY. SEE ITEM ㉟

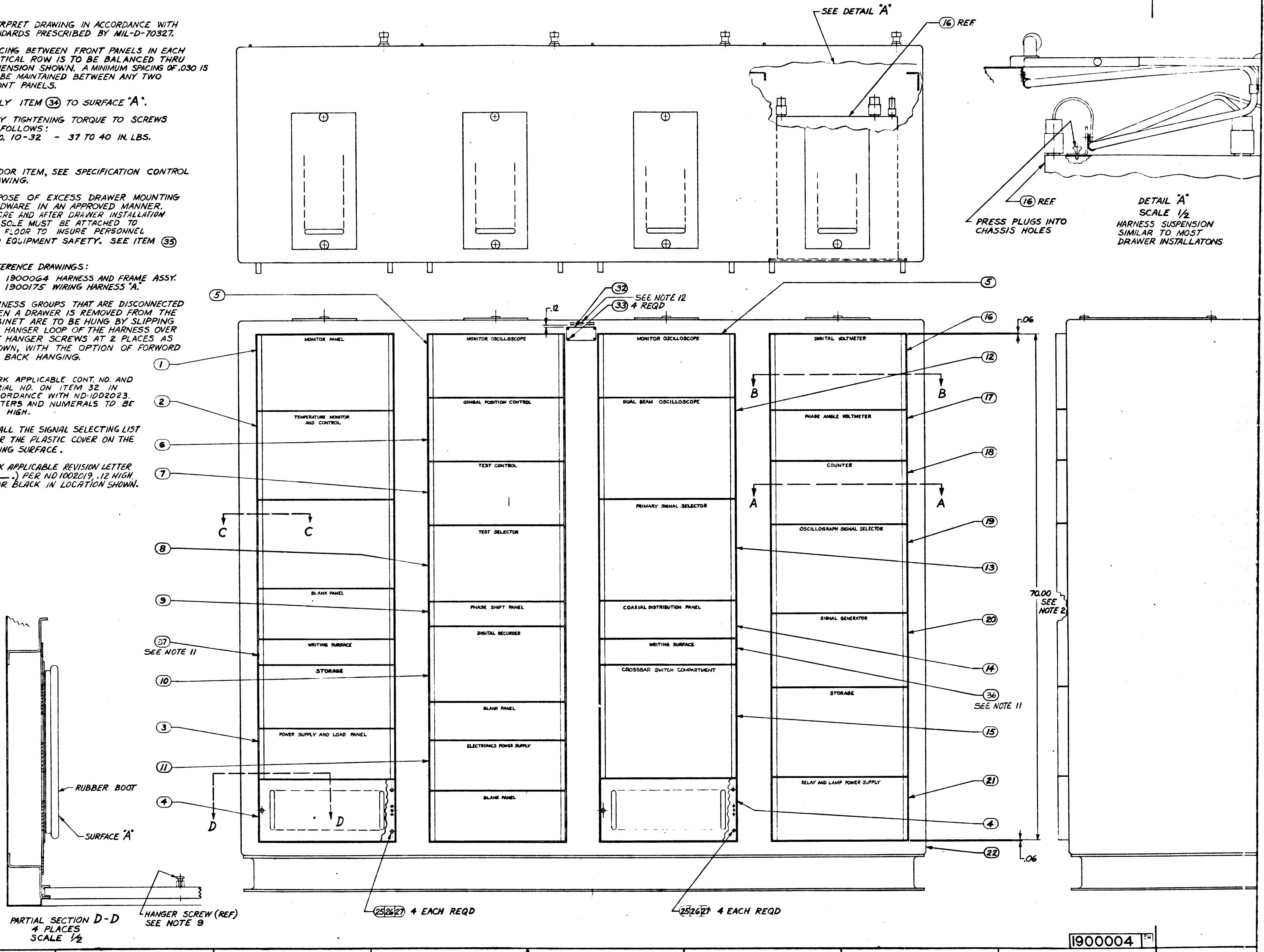
8. REFERENCE DRAWINGS:
   1900064 HARNESS AND FRAME ASSY.
   1900175 WIRING HARNESS "A."

9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS AT 2 PLACES AS SHOWN, WITH THE OPTION OF FORWORD OR BACK HANGING.

10. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 32 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .12 HIGH.

11. INSTALL THE SIGNAL SELECTING LIST UNDER THE PLASTIC COVER ON THE WRITING SURFACE.

12. MARK APPLICABLE REVISION LETTER (REV__.) PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.


16
15
14
13
12
11
10
9
8
H
G
F
E
D
C
B
A
SEE DETAIL "A"
⑯ REF
⑯ REF
PRESS PLUGS INTO CHASSIS HOLES
DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION SIMILAR TO MOST DRAWER INSTALLATONS
⑤
⑤
㉜
SEE NOTE 12
㉝ 4 REQD
.12
⑯
.06
MONITOR PANEL
TEMPERATURE MONITOR AND CONTROL
BLANK PANEL
WRITING SURFACE
STORAGE
POWER SUPPLY AND LOAD PANEL
MONITOR OSCILLOSCOPE
GIMBAL POSITION CONTROL
TEST CONTROL
TEST SELECTOR
PHASE SHIFT PANEL
DIGITAL RECORDER
BLANK PANEL
ELECTRONICS POWER SUPPLY
BLANK PANEL
MONITOR OSCILLOSCOPE
DUAL BEAM OSCILLOSCOPE
PRIMARY SIGNAL SELECTOR
COAXIAL DISTRIBUTION PANEL
WRITING SURFACE
CROSSBAR SWITCH COMPARTMENT
DIGITAL VOLTMETER
PHASE ANGLE VOLTMETER
COUNTER
OSCILLOGRAPH SIGNAL SELECTOR
SIGNAL GENERATOR
STORAGE
RELAY AND LAMP POWER SUPPLY
B
B
A
A
C
C
D
D
①
②
⑥
⑦
⑧
⑨
㊲ SEE NOTE 11
⑩
③
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⑭
㊱ SEE NOTE 11
⑮
㉑
④
㉒
70.00 SEE NOTE 2
.06
㉕㉖㉗ 4 EACH REQD
㉕㉖㉗ 4 EACH REQD
RUBBER BOOT
SURFACE "A"
HANGER SCREW (REF) SEE NOTE 9
PARTIAL SECTION D-D
4 PLACES
SCALE 1/2

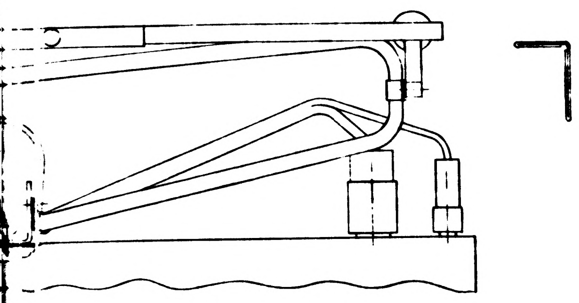
1900004 SH

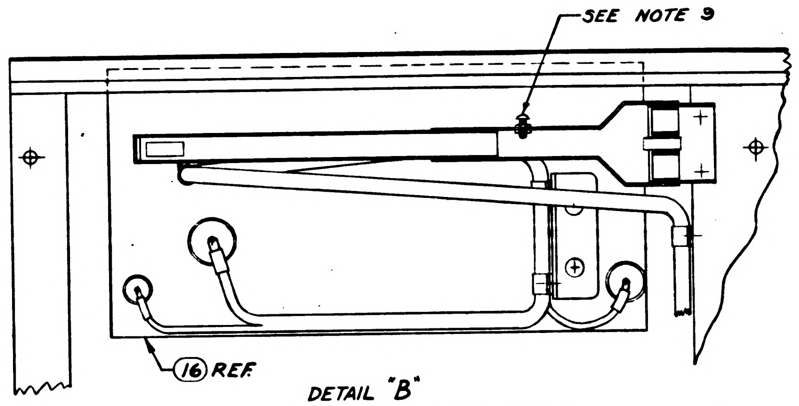
171900004

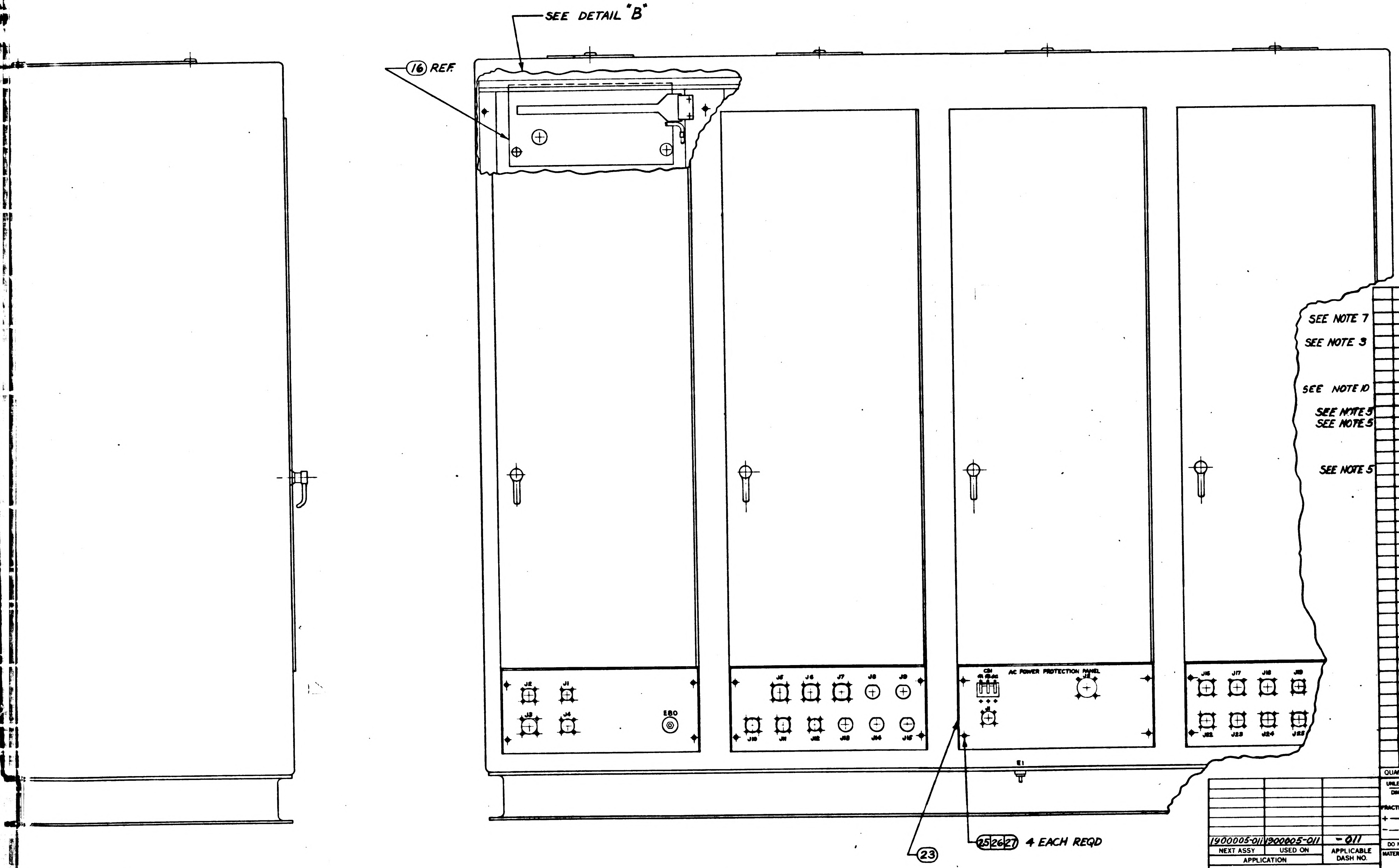
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REVISION "M" WITH CHANGE PER CM-193360		8 JAN 64	RJM
P		CHANGE IN ACCORDANCE WITH CM 194391 PER TDRR 06565		4 FEB 64	
R		CHANGE IN ACCORDANCE WITH CM 195131 PER TDRR 07.58		10 MAR 64	L.S.
S	-	CHANGE IN ACCORDANCE WITH CM-195804 PER TDRR 08159	—	18 MAR 64	
T	-	CHANGE IN ACCORDANCE WITH CM 195956 PER TDRR 08160	—	27 MAR 64	
U	-	CHANGE IN ACCORDANCE WITH CM 197465 REVISED PER TDRR 10218		11 MAY 64	GG
V		REVISED PER TDRR 10410		30 JUN 64	

V	N
U	N
T	N
S	N
R	N
P	N
N	N
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS


DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION SIMILAR TO MOST DRAWER INSTALLATONS


SEE NOTE 9
(16) REF.
DETAIL "B"
HARNESS ARRANGEMENT FOR ALL DRAWERS SIMILAR
SCALE 1/2 SEE NOTE 9


SEE DETAIL "B"
(16) REF.
J2
J1
J3
J4
EBO
J5
J6
J7
J8
J9
J10
J11
J12
J13
J14
J15
CB1
AC POWER PROTECTION PANEL
J2
J1
J16
J17
J18
J19
J22
J23
J24
J25
E1
(23)
(25)(26)(27) 4 EACH REQD

Ⓝ REPLACES REV M WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 18 MAR 63

SEE NOTE 7			1		37	1901554-002	GSE SIGNAL SELECTION LIST
			1		36	1901554-001	GSE SIGNAL SELECTION LIST
SEE NOTE 7			X		35	1900016	INSTALLATION DRAWING, O.I.A.
SEE NOTE 3			AR		34	MIL-I-8660	DOW CORNING #4, LUBRICATING GREASE
			4		33	1897109-104	SCREW, DRIVE, ROUND HEAD
SEE NOTE 10			1		32	1901304-201	NAMEPLATE, APOLLO G&N
					31		
SEE NOTE 5			2		30	1015796-001	SPACER, BAR
SEE NOTE 5			2		29	1015790-001	NUT-BAR
			28		28	1900934	SPACER, BAR
			236		27	AN960-C10L	WASHER-FLAT #10
			236		26	MS35338-81	WASHER-LOCK #10
SEE NOTE 5			236		25	1006783-44	SCREW, BUTTON HD.-HEX, SOCKET
					24		
			1		23	1900075-011	PANEL, PROTECTION, A.C. POWER, ASSY
			1		22	1900031-011	CABINET ASSY, ELECTRICAL EQUIP, ASSY
			1		21	1900049-011	POWER SUPPLY, RELAY & LAMP, ASSY
			1		20	1900043-011	GENERATOR, SIGNAL ASSY
			1		19	1900056-011	SELECTOR, SIGNAL, OSCILLOGRAPH, ASSY
			1		18	1900041-011	COUNTER, ASSY
			1		17	1900036-011	VOLTMETER, PHASE ANGLE, ASSY
			1		16	1900042-021	VOLTMETER, DIGITAL, ASSY
			1		15	1900048-011	SWITCH, CROSSBAR, ASSY
			1		14	1900166-011	PANEL, COAXIAL DISTRIBUTION, ASSY
			1		13	1900057-011	SELECTOR, SIGNAL, PRIMARY, ASSY
			1		12	1900037-011	OSCILLOSCOPE, DUAL BEAM, ASSY
			1		11	1900035-011	POWER SUPPLY, ELECTRONIC, ASSY
			1		10	1900052-011	RECORDER, DIGITAL, ASSY
			1		9	1900163-011	PHASE SHIFT PANEL ASSY
			1		8	1900082-011	SELECTOR, TEST, ASSY
			1		7	1900059-011	CONTROL, TEST, ASSY
			1		6	1900054-011	CONTROL, GIMBAL POSITION, ASSY
			2		5	1900038-011	OSCILLOSCOPE MONITOR ASSY
			2		4	1900350-011	FAN, CENTRIFUGAL, ASSY
			1		3	1900702-011	POWER SUPPLY & LOAD PANEL ASSY
			1		2	1900058-011	TEMPERATURE MONITOR & CONTROL, ASSY
			1		1	1900055-011	MONITOR PANEL ASSY
QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005-011	1900005-011	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.02 ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 21 FEB 63
CHECKED 12 NOV 63
APPROVAL 13 Nov '63
APPROVAL
NASA APPROVAL W. J. 2-25-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO.
SIZE J
1900004
SCALE 1/4
SHEET 1 OF 2

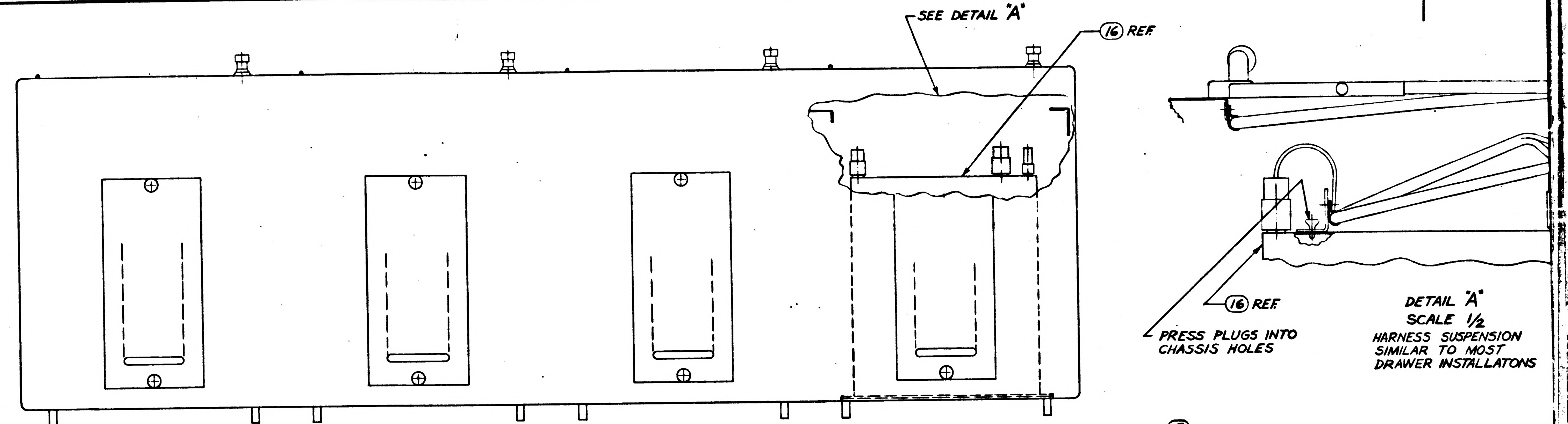
1900004

900004 SH 1

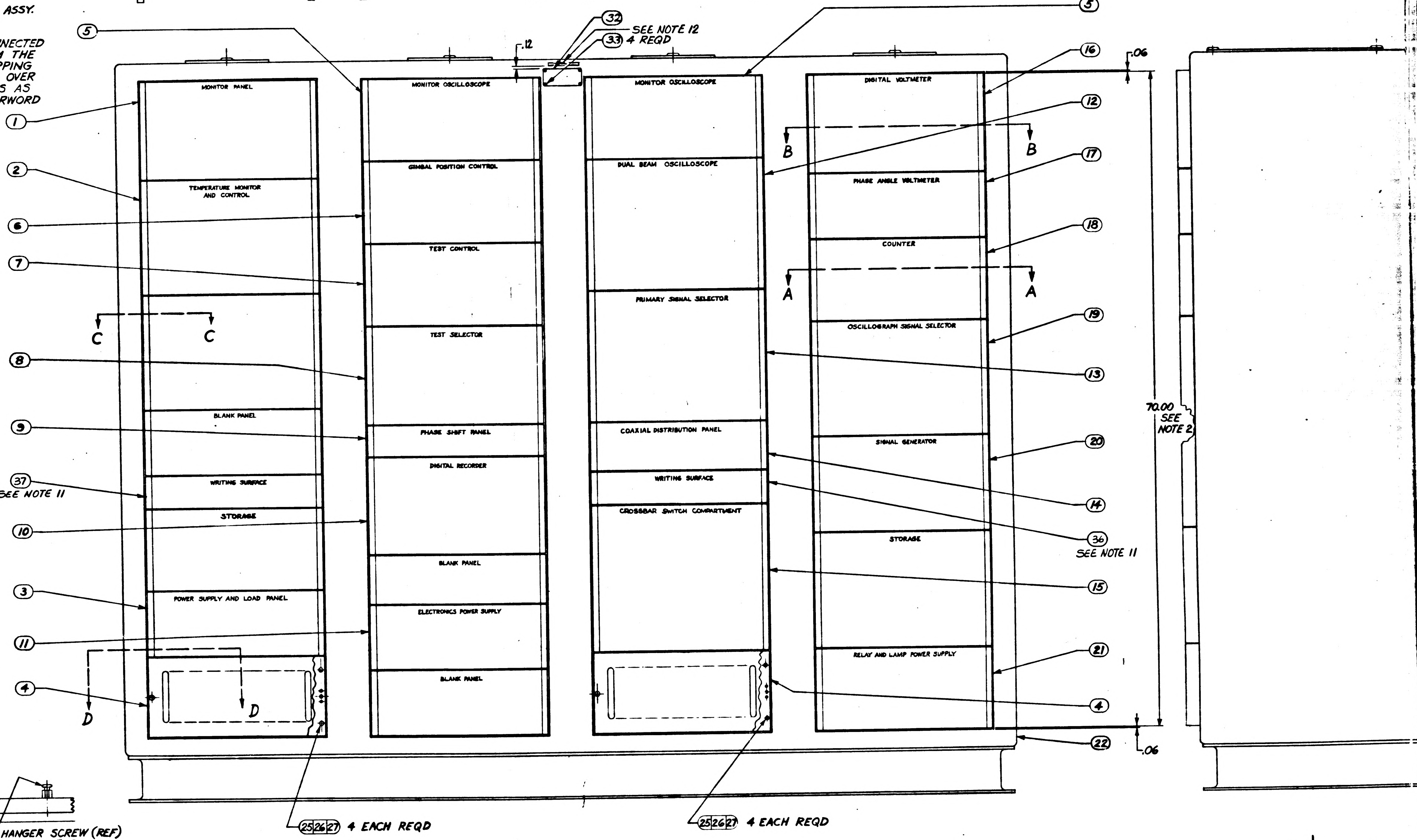
2/1900004

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SPACING BETWEEN FRONT PANELS IN EACH VERTICAL ROW IS TO BE BALANCED THRU DIMENSION SHOWN. A MINIMUM SPACING OF .030 IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.
3. APPLY ITEM ㉞ TO SURFACE "A".
4. APPLY TIGHTENING TORQUE TO SCREWS AS FOLLOWS:
   NO. 10-32 - 37 TO 40 IN. LBS.
5. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
6. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.
7. BEFORE AND AFTER DRAWER INSTALLATION CONSOLE MUST BE ATTACHED TO THE FLOOR TO INSURE PERSONNEL AND EQUIPMENT SAFETY. SEE ITEM ㉟
8. REFERENCE DRAWINGS:
   1900064 HARNESS AND FRAME ASSY.
   1900175 WIRING HARNESS "A."
9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS AT 2 PLACES AS SHOWN, WITH THE OPTION OF FORWORD OR BACK HANGING.
10. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 32 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
11. INSTALL THE SIGNAL SELECTING LIST UNDER THE PLASTIC COVER ON THE WRITING SURFACE.
12. MARK APPLICABLE REVISION LETTER (REV__.) PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.


SEE DETAIL "A"
⑯ REF.
⑯ REF.
PRESS PLUGS INTO CHASSIS HOLES

DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION SIMILAR TO MOST DRAWER INSTALLATONS


⑤
⑤
㉜ SEE NOTE 12
㉝ 4 REQD
.12
⑯
.06
MONITOR PANEL
TEMPERATURE MONITOR AND CONTROL
BLANK PANEL
WRITING SURFACE
STORAGE
POWER SUPPLY AND LOAD PANEL
MONITOR OSCILLOSCOPE
GIMBAL POSITION CONTROL
TEST CONTROL
TEST SELECTOR
PHASE SHIFT PANEL
DIGITAL RECORDER
BLANK PANEL
ELECTRONICS POWER SUPPLY
BLANK PANEL
MONITOR OSCILLOSCOPE
DUAL BEAM OSCILLOSCOPE
PRIMARY SIGNAL SELECTOR
COAXIAL DISTRIBUTION PANEL
WRITING SURFACE
CROSSBAR SWITCH COMPARTMENT
DIGITAL VOLTMETER
PHASE ANGLE VOLTMETER
COUNTER
OSCILLOGRAPH SIGNAL SELECTOR
SIGNAL GENERATOR
STORAGE
RELAY AND LAMP POWER SUPPLY
B B
A A
C C
D D
①
②
⑥
⑦
⑧
⑨
㊲ SEE NOTE 11
⑩
③
⑪
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⑭
㊱ SEE NOTE 11
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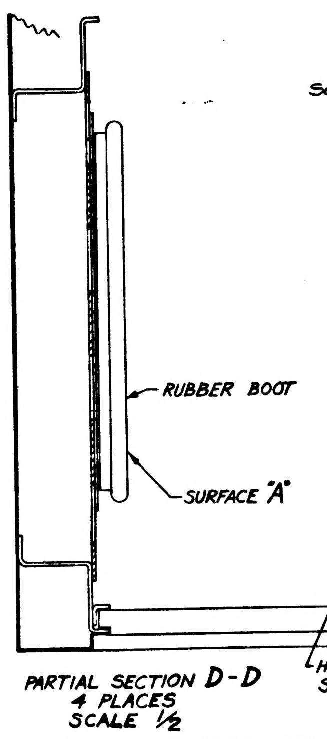
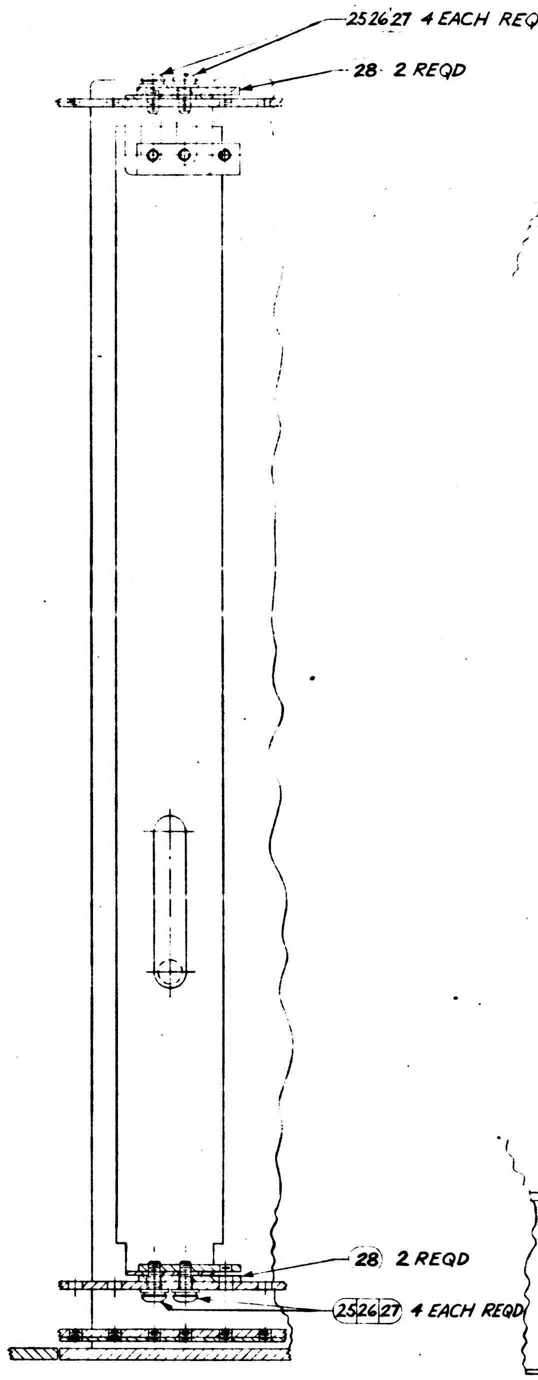
70.00 SEE NOTE 2
.06
㉕㉖㉗ 4 EACH REQD
㉕㉖㉗ 4 EACH REQD
HANGER SCREW (REF) SEE NOTE 9


RUBBER BOOT
SURFACE "A"

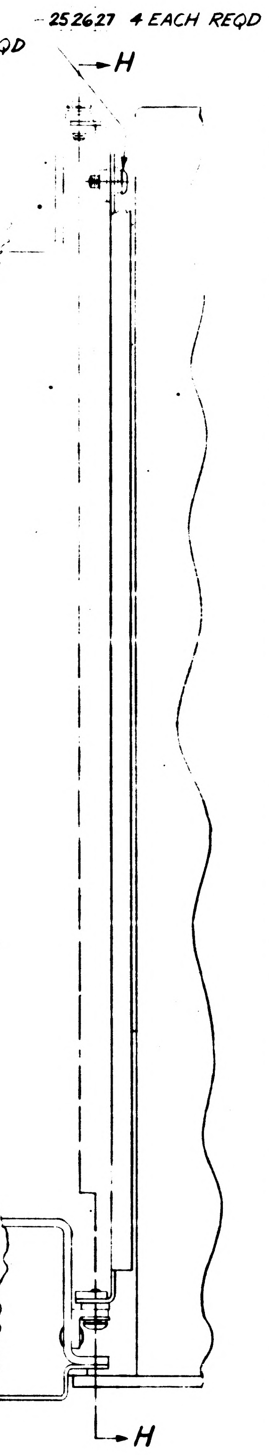
PARTIAL SECTION D-D
4 PLACES
SCALE 1/2

1900004

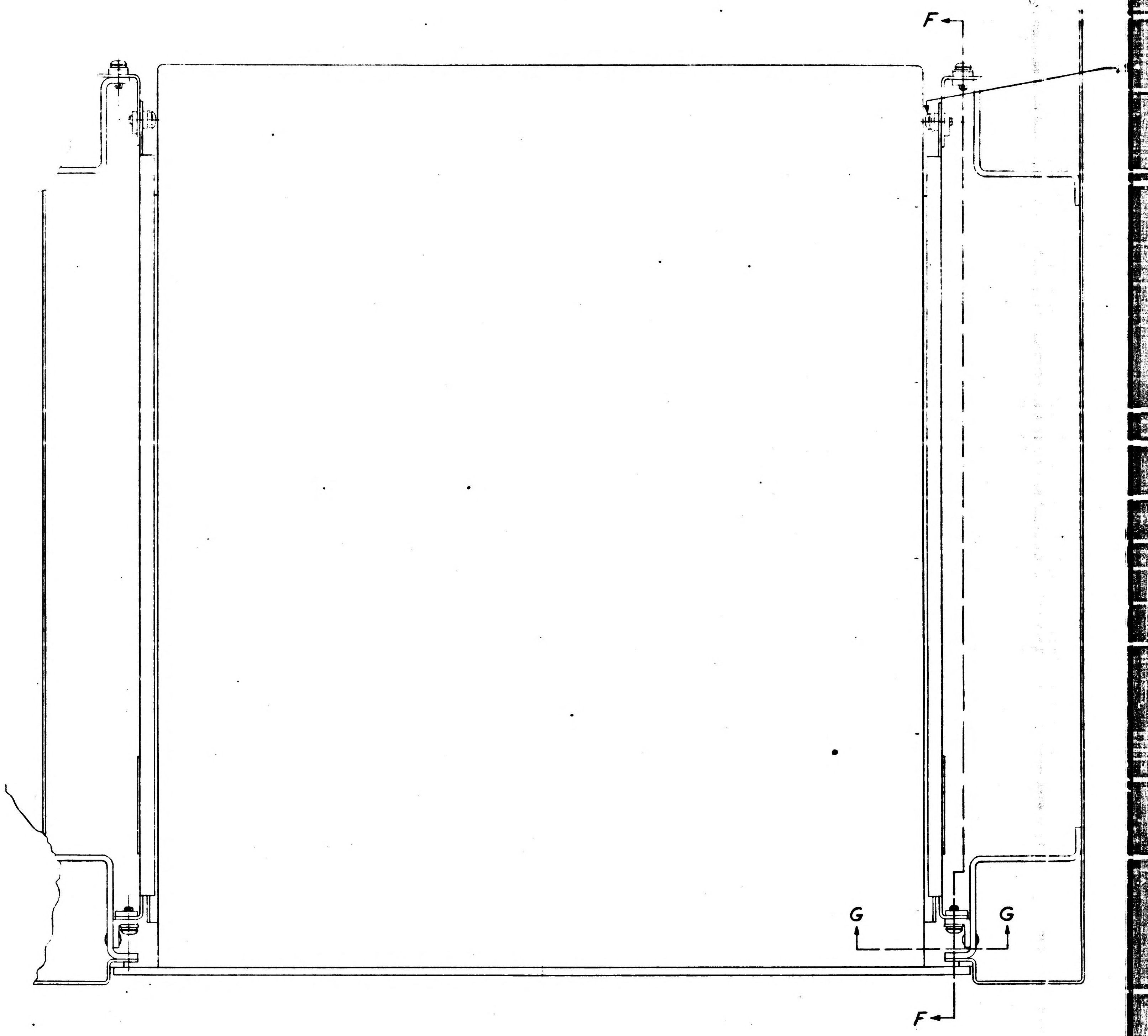
1/1900004


252627 4 EACH REQD
28 2 REQD
28 2 REQD
252627 4 EACH REQD

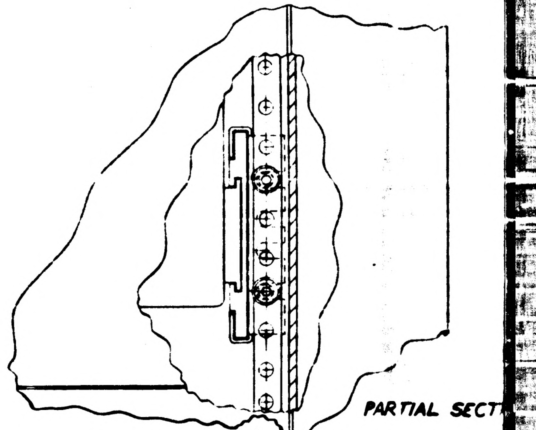
PARTIAL SECTION H-H


252627 4 EACH REQD
H
H

PARTIAL SECTION A-A
SCALE 1/1
FOR MOUNTING ITEMS ②,㊳,
③,⑦,⑧,⑪,⑰, AND ⑱
LEFT SIDE SHOWN
RIGHT SIDE SYMMETRICALLY OPPOSITE



SECTION B-B
SCALE 1/1
FOR MOUNTING ITEMS ①,⑤,⑥,⑩,⑫,㊴,
⑬,⑮,⑯,⑲,⑳, AND ㉑

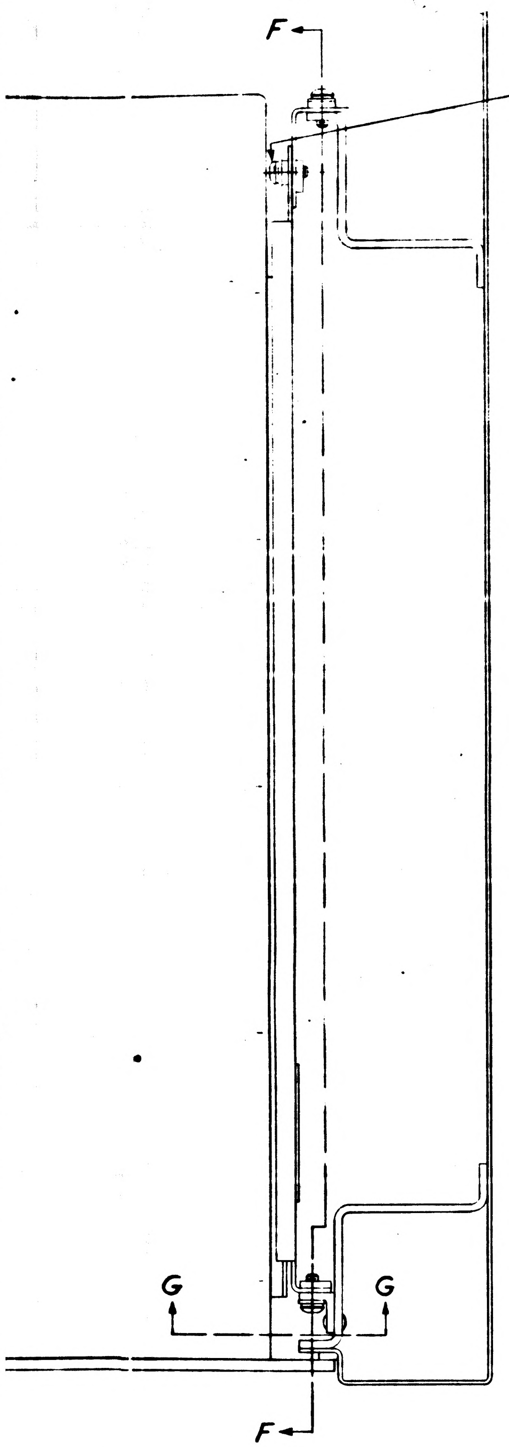


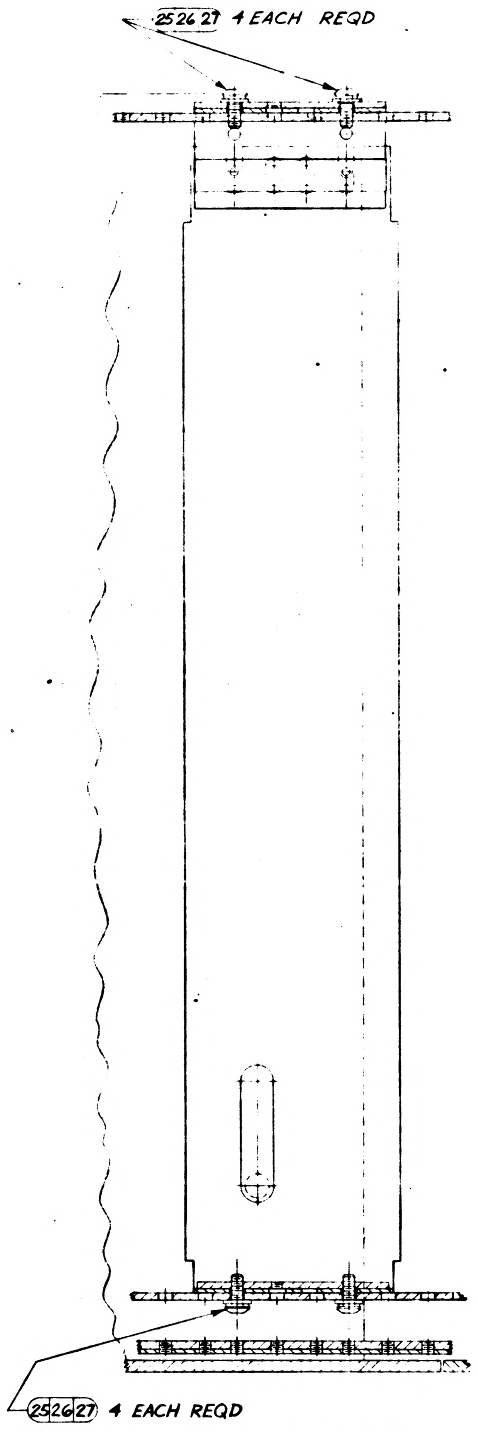
PARTIAL SECT

1900004 SH 7

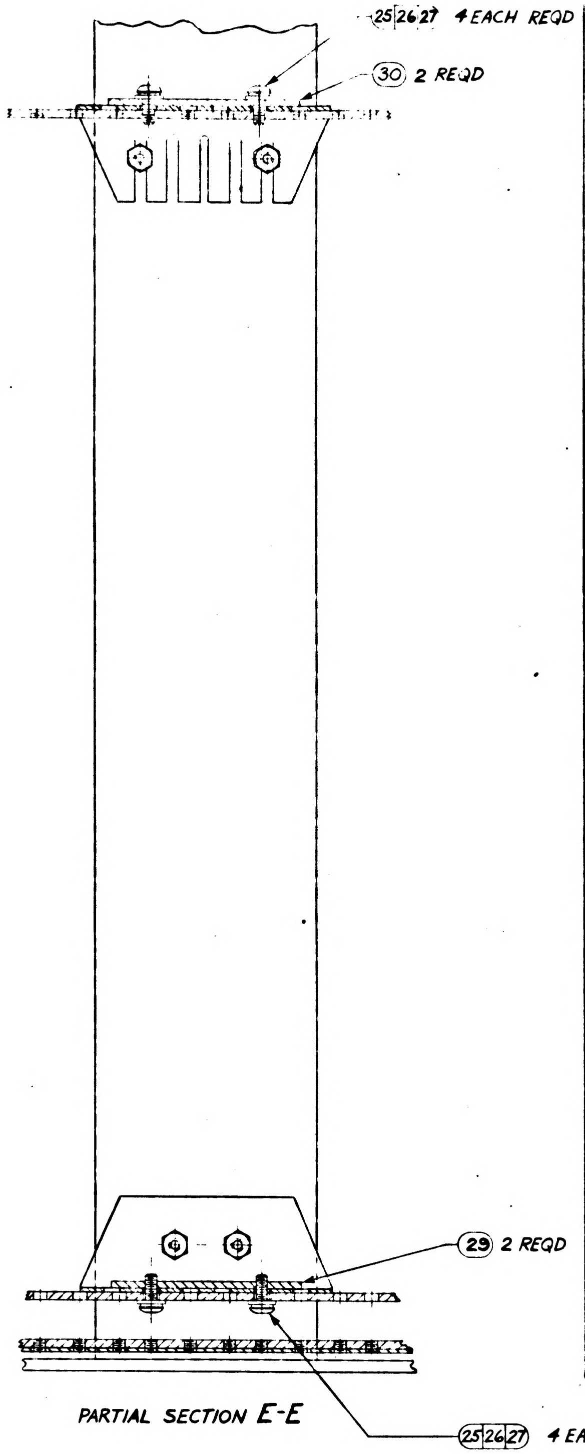
17/1900004

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		THIS SHEET ADDED. IN ACCORDANCE WITH CM-193360 PER TDRE		8 JAN 64	RJM
W		CHANGE IN ACCORDANCE WITH CM 199877 REVISED PER TDR R 13070		2 SEP 64	JK

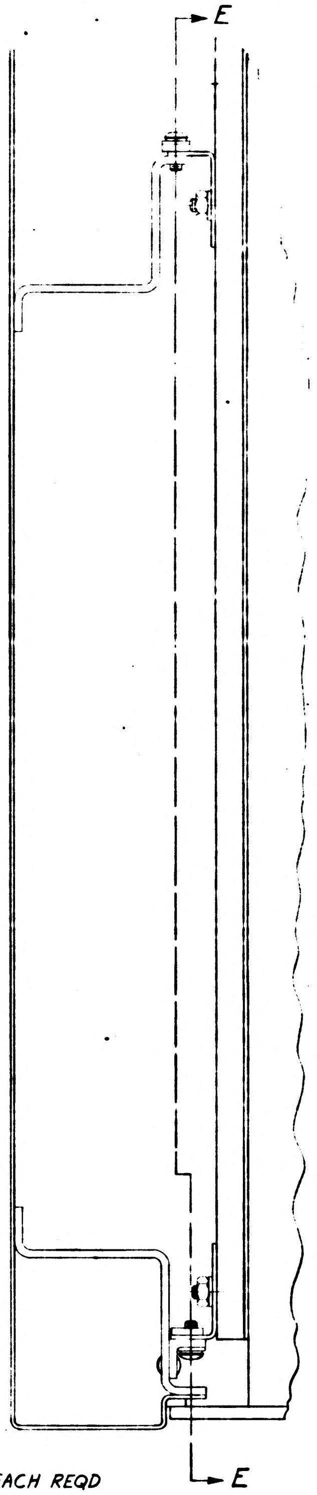




PARTIAL SECTION F-F

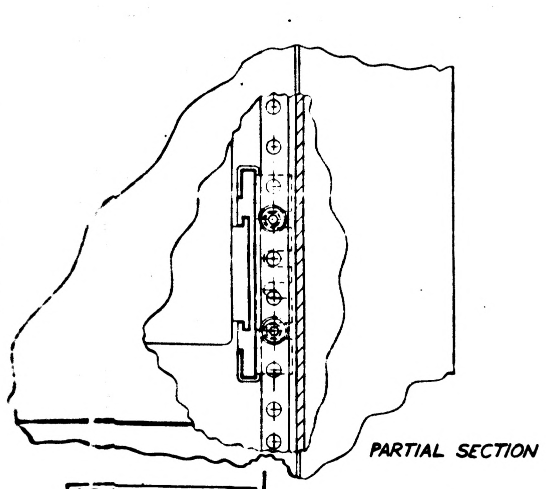


PARTIAL SECTION E-E



PARTIAL SECTION C-C
SCALE 1/1
FOR MOUNTING PART NO. 1014061 (REF.)
LEFT SIDE SHOWN
RIGHT SIDE SYMMETRICALLY OPPOSITE

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63



PARTIAL SECTION G-G

Ⓝ THIS SHEET ADDED
Ⓝ REPLACES REV M WITH CHANGE

1900004 W

1900005-021	1900005-021	021
1900005-011	1900005-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.02	+ —
— —	±.005	— —

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN DATE 21 FEB 63
CHECKED 12 NOV 63
APPROVAL
APPROVAL
NASA APPROVAL 2-25-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

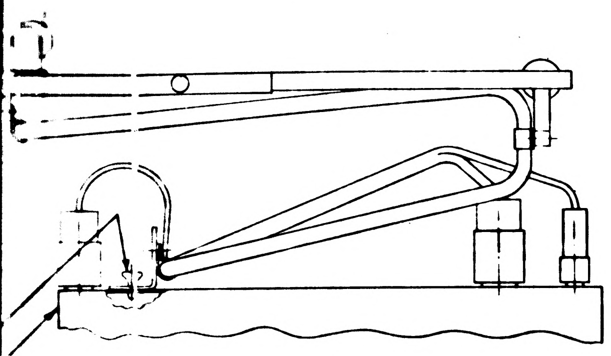
OPTICS- INERTIAL
ANALYZER

CODE IDENT NO
SIZE J
1900004
SCALE 1/4
SHEET 2 OF 2

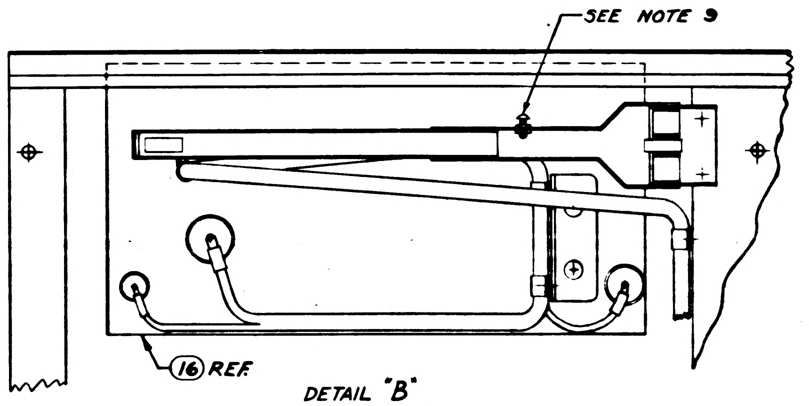
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REVISION 'M' WITH CHANGE PER CM-193360		8 JAN 64	RJM
P		CHANGE IN ACCORDANCE WITH CM 194391 PER TDRR 06565		4 FEB 64	JAC
R		CHANGE IN ACCORDANCE WITH CM 195131 PER TDRR 07158		10 MAR 64	L.S. EF
S	–	CHANGE IN ACCORDANCE WITH CM-195804 PER TDRR 08159	—	18 MAR 64	MEM
T	–	CHANGE IN ACCORDANCE WITH CM 195956 PER TDRR 08160	—	27 MAR 64	RP
U	–	CHANGE IN ACCORDANCE WITH CM 197465 REVISED PER TDR 10218		11 MAY 64	RS GG
V		REVISED PER TDRR 10410		30 JUN 64	MEM
W		CHANGE IN ACCORDANCE WITH CM 199877 REVISED PER TDRR 13070		8 SEP 64	
Y		REVISED PER TDRR 13069		6 OCT 64	JWP

Y	W
W	W
V	N
U	N
T	N
S	N
R	N
P	N
N	N
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS



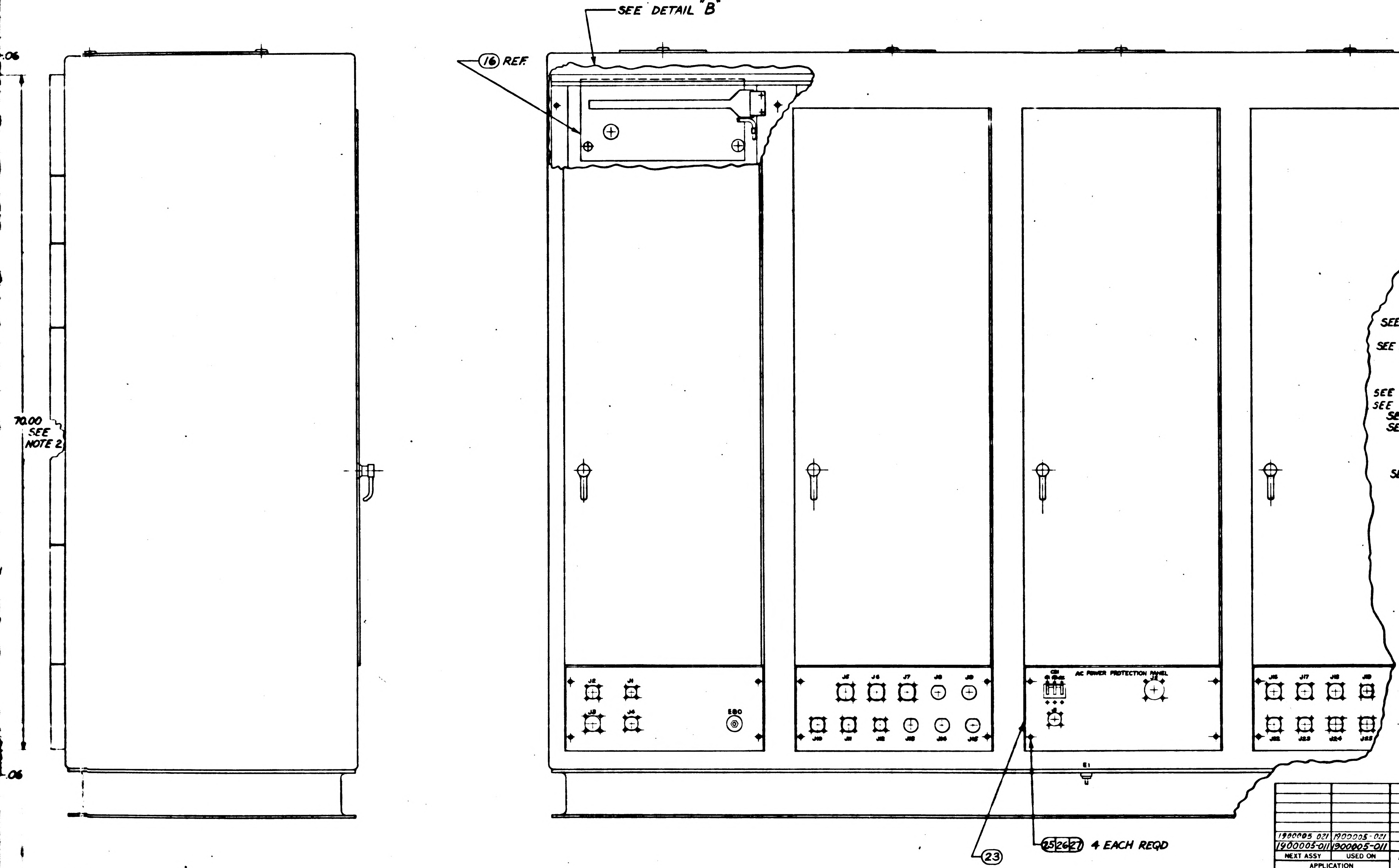
DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION
SIMILAR TO MOST
DRAWER INSTALLATONS



DETAIL "B"
HARNESS ARRANGEMENT FOR
ALL DRAWERS SIMILAR
SCALE 1/2 SEE NOTE 9

Ⓝ REPLACES REV M WITH CHANGE

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63



			1			39	1901848-011	SELECTOR, SIGNAL, PRIMARY
			1			38	1900059-021	CONTROL, TEST ASSY
			1	1		37	1901554-002	GSE SIGNAL SELECTION LIST
			1	1		36	1901554-001	GSE SIGNAL SELECTION LIST
SEE NOTE 7			X	X		35	1900016	INSTALLATION DRAWING, O.I.A.
SEE NOTE 3			AR	AR		34	MIL-I-8660	DOW CORNING #4, LUBRICATING GREASE
			4	4		33	1897109-104	SCREW, DRIVE, ROUND HEAD
SEE NOTE 10				1		32	1901304-201	NAMEPLATE, APOLLO G&N
SEE NOTE 10			1			31	1901304 202	NAMEPLATE, APOLLO G&N
SEE NOTE 5			2	2		30	1015796-001	SPACER, BAR
SEE NOTE 5			2	2		29	1015790-001	NUT-BAR
			28	28		28	1900934	SPACER, BAR
			244	244		27	AN960-C10L	WASHER-FLAT #10
			244	244		26	MS35338-81	WASHER-LOCK #10
SEE NOTE 5			244	244		25	1006783-44	SCREW, BUTTON HD.-HEX, SOCKET
			1			24	1900031-021	CABINET ASSY, ELECT EQUIP ASSY.
			1	1		23	1900075-011	PANEL, PROTECTION, A.C. POWER, ASSY
				1		22	1900031-011	CABINET ASSY, ELECTRICAL EQUIP, ASSY
			1	1		21	1900049-011	POWER SUPPLY, RELAY & LAMP, ASSY
			1	1		20	1900043-011	GENERATOR, SIGNAL ASSY
			1	1		19	1900056-011	SELECTOR, SIGNAL, OSCILLOGRAPH ASSY
			1	1		18	1900041-011	COUNTER, ASSY
			1	1		17	1900036-011	VOLTMETER, PHASE ANGLE, ASSY
			1	1		16	1900042-021	VOLTMETER, DIGITAL, ASSY
			1	1		15	1900048-011	SWITCH, CROSSBAR, ASSY
			1	1		14	1900166-011	PANEL, COAXIAL DISTRIBUTION, ASSY
				1		13	1900057-011	SELECTOR, SIGNAL, PRIMARY, ASSY
			1	1		12	1900037-011	OSCILLOSCOPE, DUAL BEAM, ASSY
			1	1		11	1900035-011	POWER SUPPLY, ELECTRONIC, ASSY
			1	1		10	1900052-011	RECORDER, DIGITAL, ASSY
			1	1		9	1900163-011	PHASE SHIFT PANEL ASSY
			1	1		8	1900082-011	SELECTOR, TEST, ASSY
				1		7	1900059-011	CONTROL, TEST, ASSY
			1	1		6	1900054-011	CONTROL, GIMBAL POSITION, ASSY
			2	2		5	1900038-011	OSCILLOSCOPE MONITOR ASSY
			2	2		4	1900350-011	FAN, CENTRIFUGAL, ASSY
			1	1		3	1900702-011	POWER SUPPLY & LOAD PANEL ASSY
			1	1		2	1900058-011	TEMPERATURE MONITOR & CONTROL, ASSY
			1	1		1	1900055-011	MONITOR PANEL ASSY
			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005 021	1900005-021	-021
1900005-011	1900005-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +— DECIMALS ±.02 ±.02 ANGLES +—
—— +.005 -.005 ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E.B. Jones DATE 21 FEB 63
CHECKED A. Morich 12 NOV 63
APPROVAL C.C. Stan 13 Nov 63
APPROVAL L Gelman 2/6/64
NASA APPROVAL W.J. Rhine 2-25-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO.
SIZE J
1900004
SCALE 1/4
SHEET 1 OF 2

1900004 SH

2/1900004

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. SPACING BETWEEN FRONT PANELS IN EACH VERTICAL ROW IS TO BE BALANCED THRU DIMENSION SHOWN. A MINIMUM SPACING OF .030 IS TO BE MAINTAINED BETWEEN ANY TWO FRONT PANELS.

3. APPLY ITEM ㉞ TO SURFACE "A".

4. APPLY TIGHTENING TORQUE TO SCREWS AS FOLLOWS:
   NO. 10-32 - 37 TO 40 IN. LBS.

5. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.

6. DISPOSE OF EXCESS DRAWER MOUNTING HARDWARE IN AN APPROVED MANNER.

7. BEFORE AND AFTER DRAWER INSTALLATION CONSOLE MUST BE ATTACHED TO THE FLOOR TO INSURE PERSONNEL AND EQUIPMENT SAFETY. SEE ITEM ㉟

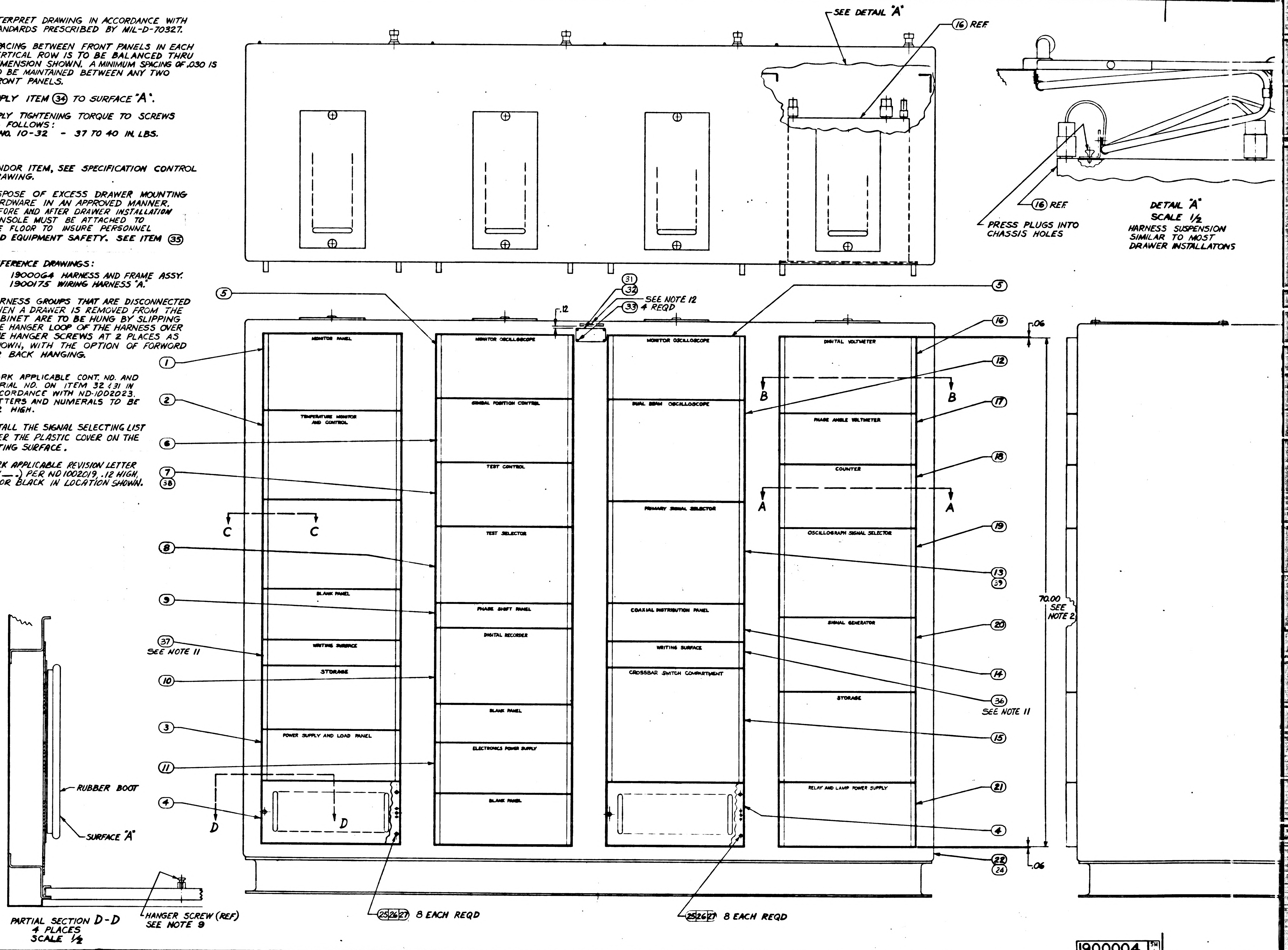
8. REFERENCE DRAWINGS:
   1900064 HARNESS AND FRAME ASSY.
   1900175 WIRING HARNESS "A."

9. HARNESS GROUPS THAT ARE DISCONNECTED WHEN A DRAWER IS REMOVED FROM THE CABINET ARE TO BE HUNG BY SLIPPING THE HANGER LOOP OF THE HARNESS OVER THE HANGER SCREWS AT 2 PLACES AS SHOWN, WITH THE OPTION OF FORWORD OR BACK HANGING.

10. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 32 & 31 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .12 HIGH.

11. INSTALL THE SIGNAL SELECTING LIST UNDER THE PLASTIC COVER ON THE WRITING SURFACE.

12. MARK APPLICABLE REVISION LETTER (REV__.) PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.


16
15
14
13
12
11
10
9
8
H
G
F
E
D
C
B
A
SEE DETAIL "A"
⑯ REF
⑯ REF
PRESS PLUGS INTO CHASSIS HOLES
DETAIL "A"
SCALE 1/2
HARNESS SUSPENSION SIMILAR TO MOST DRAWER INSTALLATONS
⑤
⑤
㉛
㉜
SEE NOTE 12
㉝ 4 REQD
.12
.06
.06
70.00 SEE NOTE 2
MONITOR PANEL
TEMPERATURE MONITOR AND CONTROL
BLANK PANEL
WRITING SURFACE
STORAGE
POWER SUPPLY AND LOAD PANEL
MONITOR OSCILLOSCOPE
GIMBAL POSITION CONTROL
TEST CONTROL
TEST SELECTOR
PHASE SHIFT PANEL
DIGITAL RECORDER
BLANK PANEL
ELECTRONICS POWER SUPPLY
BLANK PANEL
MONITOR OSCILLOSCOPE
DUAL BEAM OSCILLOSCOPE
PRIMARY SIGNAL SELECTOR
COAXIAL DISTRIBUTION PANEL
WRITING SURFACE
CROSSBAR SWITCH COMPARTMENT
DIGITAL VOLTMETER
PHASE ANGLE VOLTMETER
COUNTER
OSCILLOGRAPH SIGNAL SELECTOR
SIGNAL GENERATOR
STORAGE
RELAY AND LAMP POWER SUPPLY
①
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㊲ SEE NOTE 11
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㊱ SEE NOTE 11
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C
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B
B
A
A
D
D
㉕㉖㉗ 8 EACH REQD
㉕㉖㉗ 8 EACH REQD
RUBBER BOOT
SURFACE "A"
HANGER SCREW (REF) SEE NOTE 9
PARTIAL SECTION D-D
4 PLACES
SCALE 1/2

1900004 SH 1

1/1900004

REVISIONS				
SYM	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL AMBray
APPROVAL ARodel 22 FEB 63
NASA APPROVAL W. S. Swingle 13 March 1963
MIT APPROVAL W. Kupfer 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS - INERTIAL
ANALYZER

CODE IDENT NO.
SIZE B
1900004
SCALE
SHEET

MIL 10778—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS				
SYM	DESCRIPTION	CHG NO.	DATE	APPD.
A	ADDED -011 TO PART NO. AND ADDED 1- 1900004 TO LIST OF MAT.	MXC 186538	15 MAY 63	JHR / RJP
A_1	ADDED P/N 1900012-011 TO ITEM 3 -IMU MOUNTING FIXTURE ASSY	MXC 186808	27 MAY 63	JGL / A.A.R.
A2	CHANGE IN ACCORDANCE WITH MXC 187158		25 JUN 63	E.M. / EFS
A3	CHANGE IN ACCORDANCE WITH MCX 187248		25 JUN 63	E.M. / EFS
B	CHANGE IN ACCORDANCE WITH MXC-188186 TDRR 03860	15 Oct 63 WK.	19 AUG 63	J.J.J. / WA

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 63

PICTURE INCOMPLETE

			1		7	1900000-011	OSCILLOGRAPH CONSOLE, ASSY
			1		6	1900145-011	SUPPORT CONSOLE
			1		5		
			1		4	1900433-011	JUNCTION BOX-GSE
			1		3		
			1		2		
			1		1	1900004-011	OPTICS INERTIAL ANALYZER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL QM Bray
APPROVAL 22 FEB 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INERTIAL SUB-SYSTEM TEST EQUIPMENT

CODE IDENT NO. SIZE B 1900005
SCALE SHEET

MIL 10778—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

E 1900005

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 63

Ⓔ REPLACED WITH CHANGE BY REV F

PICTURE INCOMPLETE

REVISIONS

SYM	DESCRIPTION	CHG NO.	DATE	APPD.
A	ADDED -011 TO PART NO. AND ADDED 1- 1900004 TO LIST OF MAT.	MXC 186538	15 MAY 63	JHR / RJP
A1	ADDED P/N 1900012-011 TO ITEM 3 -IMU MOUNTING FIXTURE ASSY	MXC 186808	27 MAY 63	JGL / A.A.R.
A2	CHANGE IN ACCORDANCE WITH MXC 187158		25 JUN 63	E.M. / EFS
A3	CHANGE IN ACCORDANCE WITH MCX 187248		25 JUN 63	E.M. / EFS
B	CHANGE IN ACCORDANCE WITH MXC-188186 TDRR 03860	150 63 WK.	19 AUG 63	J.J.J. / WA
C	CHANGE IN ACCORDANCE WITH MXC-189783		29 OCT 63	ALK / On
D	CHANGE IN ACCORDANCE WITH MXC-190236		30 OCT 63	ALK / On
E	**REPLACED WITH CHANGE BY REV. F** PER MXC 191344 PER TDRR [illegible]		5 NOV. 63	ALK / On

			1		7	1900000-011	OSCILLOGRAPH CONSOLE, ASSY
			1		6	1900145-011	SUPPORT CONSOLE
			1		5	1900809-011	PSA TRAY EXTENDER SET
			1		4	1900433-011	JUNCTION BOX-GSE
			1				
			1		2	1900740	CABLE, INTERCONNECT
			1		1	1900004-011	OPTICS INERTIAL ANALYZER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL AM Bray
APPROVAL 22 FEB 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INERTIAL SUB-SYSTEM TEST EQUIPMENT

CODE IDENT NO.

SIZE B

1900005

SCALE

SHEET

MIL 10778-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPLACES REV.E WITH CHANGE PER MXC 191344 REVISED PER TDR 04709		5 NOV 63 14 NOV 63	ALK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63

PICTURE INCOMPLETE

Ⓕ REPLACES REV E WITH CHANGE

			1		7	1900000-011	OSCILLOGRAPH CONSOLE, ASSY
			1		6	1900145-011	SUPPORT CONSOLE
			1		5	1900809-011	PSA TRAY EXTENDER SET
			1		4	1900433-011	JUNCTION BOX-GSE
			1		3	1900931-011	PSA TEST POINT ADAPTER ASSY
			1		2	1900740	CABLE, INTERCONNECT
			1		1	1900004-011	OPTICS INERTIAL ANALYZER
QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

1900030	1900030	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ \+ \+
− − −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL A.K. BRAY
APPROVAL 11/19/63
NASA APPROVAL Jack Barnard
MIT APPROVAL 11/19/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INERTIAL SUB-SYSTEM
TEST EQUIPMENT

CODE IDENT NO.
SIZE C
1900005
SCALE —
SHEET

1900005 F

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPLACES REV.E WITH CHANGE PER MXC 191344 REVISED PER TDR 04709		5 NOV 63 19 NOV 63	ALK
G		CHANGE IN ACCORDANCE WITH MXC 191662 PER TDRR 08088		11 DEC 63	A.M. RLW
H		CHANGE IN ACCORDANCE WITH MXC 192655 PER TDRR 08088		14 JAN 64	L.G.H. MEM
J		CHANGE IN ACCORDANCE WITH CM 194259 PER TDRR 08088		21 JAN 64	H.C.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 63

PICTURE INCOMPLETE

Ⓕ REPLACES REV E WITH CHANGE

			☒		9	PS1900005	PROCUREMENT SPECIFICATION FOR OPTICS INERTIAL TEST SET
			1		8	1901308	CABLE INTERCONNECT (GSE TO G&N)
			1		7	1900000-011	OSCILLOGRAPH CONSOLE, ASSY
			1		6	1900145-011	SUPPORT CONSOLE
			1		5	1900805-011	TRAY EXTENDER SET, PSA
			1		4	1900433-011	JUNCTION BOX-GSE
			1		3	1900931-011	PSA TEST POINT ADAPTER ASSY
			1		2	1900740	CABLE, INTERCONNECT
			1		1	1900004-011	OPTICS INERTIAL ANALYZER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL A.H. BRAY
APPROVAL 11/19/63
NASA APPROVAL
MIT APPROVAL 11/19/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INERTIAL SUB-SYSTEM
TEST EQUIPMENT

CODE IDENT NO.
SIZE C
1900005
SCALE —
SHEET 1 OF 1

1900005 J

MIL 1078C—P

REVISIONS				
SYM	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 21 FEB 63
CHECKED MALIKOWSKI 22 FEB 63
APPROVAL A M Bray
APPROVAL 22 FEB 63
NASA APPROVAL 13 March 1963
MIT APPROVAL 13 Mar 63 13 Mar 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INERTIAL SUB-SYSTEM
TEST EQUIPMENT

CODE IDENT NO.
SIZE B
1900005
SCALE
SHEET

MIL 10778-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS-1900005

Class B Release
TDRR 05929

PROCUREMENT SPECIFICATION

FOR

OPTICS INERTIAL TEST SET

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 05929 **DATE** 1/23/64

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA

This specification consists of page i to iii and 1 to 8 inclusive.

PROCUREMENT SPECIFICATION

FOR

OPTICS INERTIAL TEST SET

The purpose of this document is to establish the manufacturing and test requirements for procurement of the Optics Inertial Test Set for use in the APOLLO Guidance and Navigation Ground Support Equipment.

W. J. Kupfer 23 Jan 64
MIT/IL DATE

A. C. Metzger 23 Jan 64
NASA/MSC DATE

PROCUREMENT SPECIFICATION

FOR

OPTICS INERTIAL TEST SET

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Optics Inertial Test Set, hereafter called the OITS.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of invitation for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-P-116	Preservation, Methods of
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of

APOLLO G&N

ND-1002023	Procedure for Serialization of Components, Assemblies, etc. for APOLLO Guidance and Navigation Equipment
ND-1002213	Design Criteria Specification for APOLLO Ground Support Equipment
ND-1015404	General Specification, Configuration, Process and Quality Control Requirements for Suppliers of High Reliability Articles for Use in Spacecraft and Supporting Equipment
FTM-1900005	Final Test Method for Optics Inertial Test Set

DRAWINGS

APOLLO G&N

1900065	AGE-GSE Ground and Isolation Interface Mechanization Diagram

APOLLO G&N Specification
PS-1900005

Class B Release
TDRR 05929

PROCUREMENT SPECIFICATION
FOR
OPTICS INERTIAL TEST SET

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 05929 DATE 1/23/64

Record of Revisions

Ⓜ

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
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This specification consists of page i to iii and 1 to 8 inclusive.

APOLLO G&N Specification
PS-1900005

PROCUREMENT SPECIFICATION

FOR

OPTICS INERTIAL TEST SET

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W. L. Kupfer 23 Jan 64
MIT/IL DATE

R C Metzger 23 Jan 64
NASA /MSC DATE

PREPARED BY	TITLE	DATE
J S Porzekaj	Spec. Eng. Writer	1-7-64
AC Spark Plug		
EXAMINED BY	TITLE	DATE
William C Cottle	[illegible]	1-7-64
AC Spark Plug		
APPROVED BY	TITLE	DATE
William C Schmidt	GSE Engineer	1-22-64
MIT/IL		
APPROVED BY	TITLE	DATE
MIT/IL		
APPROVED BY	TITLE	DATE
MIT/IL		

APOLLO G&N Specification
PS-1900005

PROCUREMENT SPECIFICATION
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OPTICS INERTIAL TEST SET

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FTM-1900005	Final Test Method for Optics Inertial Test Set

DRAWINGS

APOLLO G&N

1900065	AGE-GSE Ground and Isolation Interface Mechanization Diagram

1900066	AGE-GSE Signal Selection Mechanization Diagram
1900077	GSE Counter Signal Select Mechanization
1900089	Mechanization Diagram - GSE System and Subsystem Monitor - Display and Controls
1900100	GSE Optics Test Mechanization
1900144	GSE Power Control and Distribution Mechanization
1900258	Test Control Mechanization
1900262	APOLLO-GSE Inertial Sub-system Test Interface Mechanization

3. REQUIREMENTS.

The requirements of this specification are classified under two headings.

General Requirements, which are mandatory requirements to be fulfilled by the contractor, are defined in 3.2.

Performance and Product Characteristics, which are not necessarily mandatory, are defined in 3.3.

3.1 DESCRIPTION. The OITS shall be capable of performing ISS and OSS tests, and when used in conjunction with a compatible AGC Test Set, shall be capable of integrated G&N system testing. The OITS shall consist of the units or assemblies, and panels or subassemblies specified in Table I.

TABLE I

OITS COMPONENTS

UNIT OR ASSEMBLY	PANELS OR SUBASSEMBLIES
AGE Coolant and Power Console	Current Source Monitor Galvanometer Guidance System Power Supply Coolant Supply Emergency Shut Down Panel
Optics Inertial Analyzer	Electronics Power Supply Phase Angle Voltmeter Digital Recorder Counter Signal Generator Digital Voltmeter Dual Beam Oscilloscope Monitor Scope Phase Shift Panel Oscillograph Signal Selector Primary Signal Selector Coaxial Distribution Panel Test Control Test Selector Relay and Lamp Power Supply Power Supply and Load Panel Temperature Monitor and Control Centrifugal Fan Assembly AC Power Protection Panel Gimbal Position Control Electrical Equipment Cabinet Assembly

TABLE I (Continued)

UNIT OR ASSEMBLY	PANELS OR SUBASSEMBLIES
Optics Inertial Analyzer (Continued)	Monitor Panel Crossbar Switch AGC Simulator
Oscillograph Console Assembly	Oscillograph Assembly Oscillograph Control Assembly Oscillograph Amplifier Assembly Oscillograph Amplifier Assembly Oscillograph Pen Control Assembly Remote Counter Indicator Centrifugal Fan Assembly Electrical Equipment Cabinet Assembly
Interconnect Cable	
GSE Junction Box Assembly	
PSA Tray Extender Set	
PSA Adapter	

3.2 GENERAL REQUIREMENTS

3.2.1 Materials and Construction. Materials, and features of construction for fabricating the OITS shall be in strict accordance with the applicable drawings and specifications referenced herein. Substitute materials or processes, or both, shall be selected of such quality as to ensure that the equipment will meet the requirements of this specification and shall be subject to prior approval of the procuring activity.

3.2.2 Weight, Dimensions, Finish, and Marking. The weight, dimensions, finish, and marking of the OITS shall comply with the requirements specified herein and on the applicable drawings.

3.2.3 Serial Numbers. Each OITS, shall be identified by a unique serial number assigned in accordance with Specification ND-1002023.

3.2.4 Workmanship. The fabrication of the OITS, its assemblies, subassemblies, and parts shall be such as to produce a unit free from any defect that would affect proper functioning in service.

3.2.5 Interchangeability. Unless otherwise specified, the OITS and its component parts shall be physically and functionally interchangeable without selection or fitting.

3.2.6 General Specification. Unless otherwise specified, the requirements specified in Specification ND-1002213 apply as requirements of this specification.

3.2.7 Functional Requirements. The functional requirements of the OITS shall be in accordance with the requirements of Specification ND-1002213 and the following drawings:

a. 1900065
b. 1900066
c. 1900077
d. 1900089
e. 1900100
f. 1900144
g. 1900258
h. 1900262

3.2.8 Design Requirements. The requirements for design of the OITS shall be as specified in Specification ND-1002213 and the applicable drawings.

3.3 PERFORMANCE AND PRODUCT CHARACTERISTICS. The following characteristics are stated to inform the vendor of specific characteristics and of the goals that were considered in the design. Inclusion of this information shall not be construed by the supplier as authorization to modify the design.

If the design of any part is not completely specified by the contractual documents, the supplier may submit a suggested design document for approval which will support these characteristics.

If, in the opinion of the supplier, any design or testing shall impose undue time delay or expense, he shall so state, in detail, in a counterproposal, substantiating all contributing factors when submitting a bid, proposal, or change request in connection with this specification.

Requests for changes to or deviations from this specification or applicable drawings, specifications, publications, materials, or processes specified herein shall be accompanied by written justification.

3.3.1 Design Characteristics

3.3.1.1 Reliability. The OITS shall be capable of operating a minimum of consecutive hours without maintenance under any combination of conditions specified herein and shall have a maximum probability of failure of percent at a confidence level of percent.

3.3.1.2 Service Life.

3.3.1.2.1 Operating Life. The OITS design is intended to meet performance specifications for at least hours of operation over a year period, excluding the manufacturer's test time of the complete unit.

3.3.1.2.2 Shelf Life. The OITS design is intended to have a shelf life of at least years, without operation, at ambient room temperature after final acceptance at the vendor's plant.

4. QUALITY ASSURANCE PROVISIONS

4.1 GENERAL. Unless otherwise specified herein, the supplier is responsible for the performance of all inspection requirements prior to submission for NASA inspection and acceptance. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to NASA. Inspection records of the examinations and tests shall be kept complete and available to NASA as specified in the contract or order. The supplier shall conform to Class 3 of Specification ND-1015404.

4.1.1 Acceptance Tests. These tests shall be accomplished on each OITS being submitted for acceptance under the contract. Acceptance test data on each unit accepted must accompany shipment to the purchaser. Acceptance tests shall be witnessed by the cognizant government inspector, a representative of the purchaser, or as the purchaser may direct in the procurement order. These tests are detailed in 4.2. Failure of the OITS to comply with these requirements shall result in rejection of the item.

4.1.2 Test Conditions. Unless otherwise specified herein, the OITS shall be subjected to tests under the following ambient conditions:

a. Temperature	25° ±10°C
b. Relative Humidity	90% max
c. Barometric Pressure	28 to 32 inches of Hg

4.2 ACCEPTANCE TESTS. Acceptance tests for the OITS shall consist of all of the tests of Specification FTM-1900005.

5. PREPARATION FOR DELIVERY

5.1 PRESERVATION AND PACKAGING. The OITS shall be preserved and packaged in accordance with Level C of Specification MIL-E-17555.

5.1.1 Level C (Minimum Military Packaging). Level C packaging is that which will afford protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. This level, in general, will conform to applicable carrier rules and regulations of this level.

5.1.1.1 Cleaning. Cleaning for Level C preservation and packaging shall be in accordance with Method C-1 of Specification MIL-P-116.

5.1.1.2 Unit Protection. The OITS shall be individually afforded unit protection in accordance with Method III of Specification MIL-P-116. Items not used within the time period specified must either be preserved or repackaged in accordance with Level A or Level B requirements of Specification MIL-E-17555 if storage beyond an additional year is anticipated.

5.2 REPAIR PARTS. Repair parts shall have preservation and packaging per the applicable repair parts list and its packaging supplement.

5.3 PACKING. The equipment shall be packed for shipment in accordance with Level C of Specification MIL-E-17555.

5.4 MARKING. In addition to any special marking required by the contract or order, the marking of unit, interior packages, and exterior shipping containers shall be in accordance with Level C of Specification MIL-E-17555 as specified.

6. NOTES. None.

Notice: When APOLLO G&N drawings, specifications, or other data are used for any purpose other than in connection with a definitely related NASA procurement operation, NASA thereby incurs no responsibility, nor any obligation whatsoever; and the fact that NASA may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

JSP:pbv

REQUIREMENTS:
MODEL NO. 1678, SIZE 6 MODIFIED PER PROCUREMENT SPECIFICATION ND 1002065.

QUALIFIED VENDOR:
INTERNATIONAL MACHINE & TOOL CORP.
WARWICK INDUSTRIAL PARK
PROVIDENCE, RHODE ISLAND

REVISIONS

SYM	DESCRIPTION	CHG NO.	DATE	APPD.
A,	(A1) REVISED REQUIREMENTS, REMOVED "MODEL NO. 1678, SIZE 6" FROM TITLE.	DO 51399	26 MAR. 63	E.L.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 **DATE** 24 Apr 63

MAKE FROM (MODEL NO. 1678)

1900030	1900019
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 27 FEB 63
CHECKED MALIKOWSKI 28 FEB 63
APPROVAL Ruder 5 MARCH 63
APPROVAL Winberg 5 March 63
NASA APPROVAL 4/24/63
4/24/63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

ULTRA PRECISION ROTARY TABLE

CODE IDENT NO.
SIZE B
1900006
SCALE
SHEET

MIL 10778-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900006 B

REQUIREMENTS:
MODEL NO. 1678, SIZE 6 MODIFIED PER
PROCUREMENT SPECIFICATION ND 1002065. (M)

QUALIFIED VENDOR:
INTERNATIONAL MACHINE & TOOL CORP.
WARWICK INDUSTRIAL PARK
PROVIDENCE, RHODE ISLAND

REVISIONS

SYM	DESCRIPTION	CHG NO.	DATE	APPD.
A,	(A1) REVISED REQUIREMENTS, REMOVED "MODEL NO. 1678, SIZE 6" FROM TITLE.	DO 51399	26 MAR. 63	E.L.
B	REPLACED WITH CHANGE BY REV. C ~~PER~~ CM 194590 REVISED PER TDR 08086	—	28 JAN 64	J JJ MGM

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 **DATE** 24 Apr 63

Ⓑ **REPLACED WITH CHANGE BY REV C**

MAKE FROM (MODEL NO. 1678)

1900030	1900019
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+—	+—	+—
-—	-—	-—

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN FRIEDE DATE 27 FEB 63
CHECKED MALIKOWSKI 28 FEB 63
APPROVAL Ruder 5 MARCH 63
APPROVAL J. R. Winberg 5 March 63
NASA APPROVAL 4/24/63
J. P. 4/24/63
MIT APPROVAL W. Kupfer 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

ULTRA PRECISION ROTARY TABLE

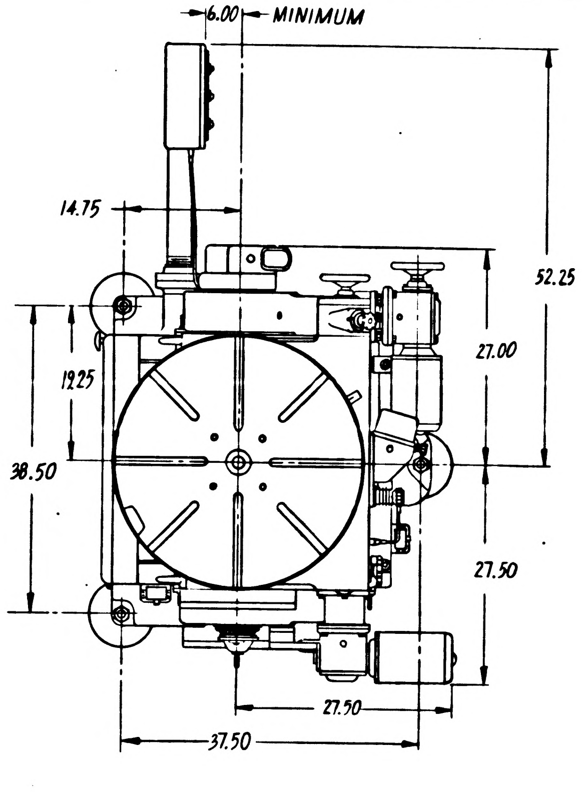
CODE IDENT NO.	SIZE	
	B	1900006
SCALE —		SHEET 1 OF 1

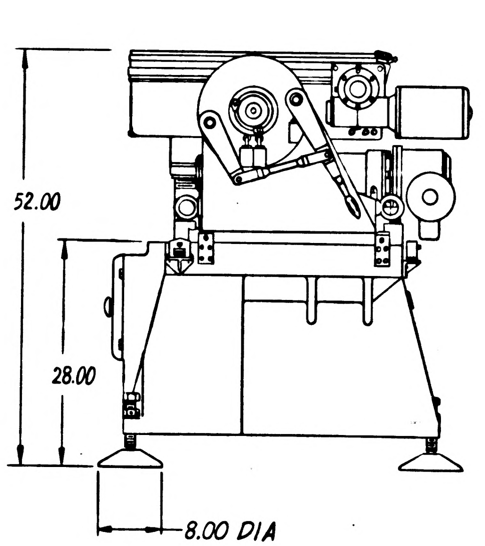
MIL 10778-F

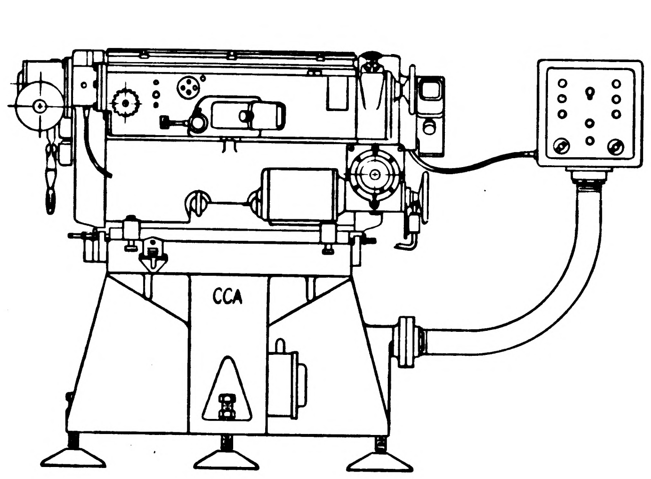
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	—	REPLACES REV. B WITH CHANGE PER: CM 94590 REVISED PER TDR 08086	—	28 JAN 64 5 May 64	JJ DEM WH

REQUIREMENTS:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MANUFACTURER'S MODEL NUMBER CCA 32-02-05, PER PROCUREMENT SPECIFICATION ND 1002065.
3. ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.







ORIGINAL SOURCE OF SUPPLY:
INTERNATIONAL MACHINE AND TOOL CORPORATION
WARWICK INDUSTRIAL PARK
PROVIDENCE, RHODE ISLAND

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00995 **DATE** 24 Apr 63

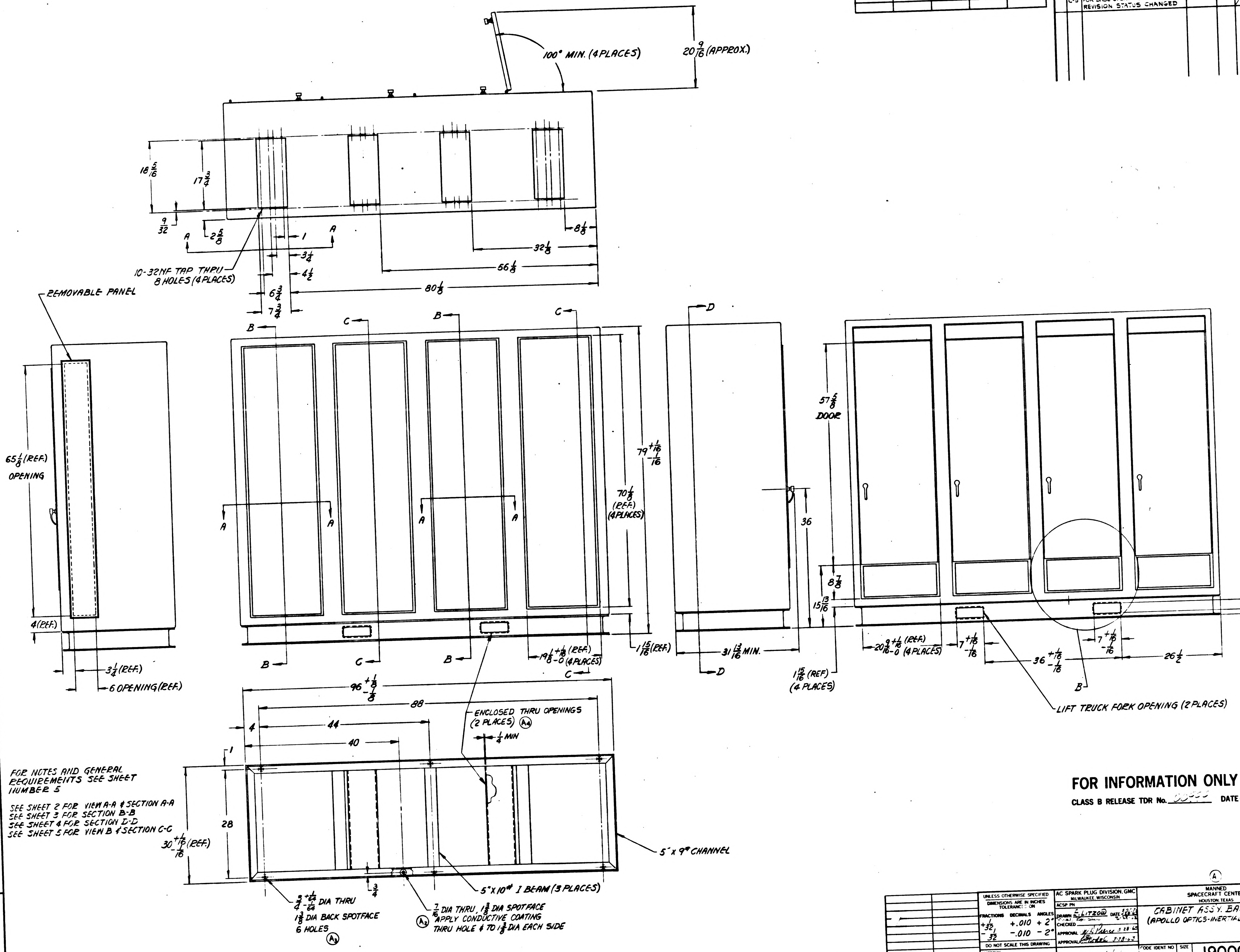
Ⓒ **REPLACES REV B WITH CHANGE**

1900926-011	1900030-041	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
1900926-011	1900030-021	DO NOT SCALE THIS DRAWING	DRAWN Tory DATE 27 Dec 63 CHECKED R W 13 Jan 64 APPROVAL R. [illegible] 13 Jan 64 APPROVAL L. Jedeman 4/28/64	ROTARY TABLE, PRECISION SOURCE CONTROL DRAWING
1900926-011	1900030-011	MATERIAL —	NASA APPROVAL [illegible] 5/5/64	CODE IDENT NO. SIZE D 1900006
NEXT ASSY	USED ON		MIT APPROVAL W [illegible] 5 May 64	
APPLICATION		CONTRACT NAS9-497		SCALE NONE SHEET 1 OF 1

1900006

REVISION STATUS OF SHEETS				
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5
A	A	A	A	A

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A,	A-1 A-6 A-6 C-5	(1)TITLE WAS (APOLLO GSE CONTROL CONSOLE) (2)ADDED 7/16 DIA THRU... (3)WAS 3/4 DIA THRU(4) ADDED INFO FOR BASE OPENINGS REVISION STATUS CHANGED	D.O. 51421	9 APR 63	



100° MIN. (4 PLACES)
20 9/16 (APPROX.)
18 5/16
17 3/4
9/32
2 5/8
A
A
1
3 1/4
4 1/2
8 1/8
32 1/8
56 1/8
80 1/8
6 3/4
7 3/4
10-32NF TAP THRU 8 HOLES (4 PLACES)
REMOVABLE PANEL
65 1/8 (REF.) OPENING
4 (REF.)
3 1/4 (REF.)
6 OPENING (REF.)
B
C
B
C
79 +1/16 -1/16
70 1/8 (REF.) (4 PLACES)
19 1/8 +1/8 -0 (REF.) (4 PLACES)
1 15/16 (REF.)
D
36
31 13/16 MIN.
D
57 5/8 DOOR
8 7/8
15 13/16
2 1/2
1 1/4
1 15/16 (REF) (4 PLACES)
20 9/16 +1/16 -0 (REF.) (4 PLACES)
7 +1/16 -1/16
36 +1/16 -1/16
7 +1/16 -1/16
26 1/2
LIFT TRUCK FORK OPENING (2 PLACES)
96 +1/8 -1/8
88
44
40
4
1
ENCLOSED THRU OPENINGS (2 PLACES) Ⓐ4
1/4 MIN
28
30 +1/16 -1/16 (REF.)
5" x 9# CHANNEL
5" x 10# I BEAM (3 PLACES)
3/4
3/4 +1/64 -1/64 DIA THRU
1 3/8 DIA BACK SPOTFACE
6 HOLES Ⓐ3
7/16 DIA THRU, 1 3/8 DIA SPOTFACE
Ⓐ2 APPLY CONDUCTIVE COATING THRU HOLE & TO 1 3/8 DIA EACH SIDE

FOR NOTES AND GENERAL
REQUIREMENTS SEE SHEET
NUMBER 5

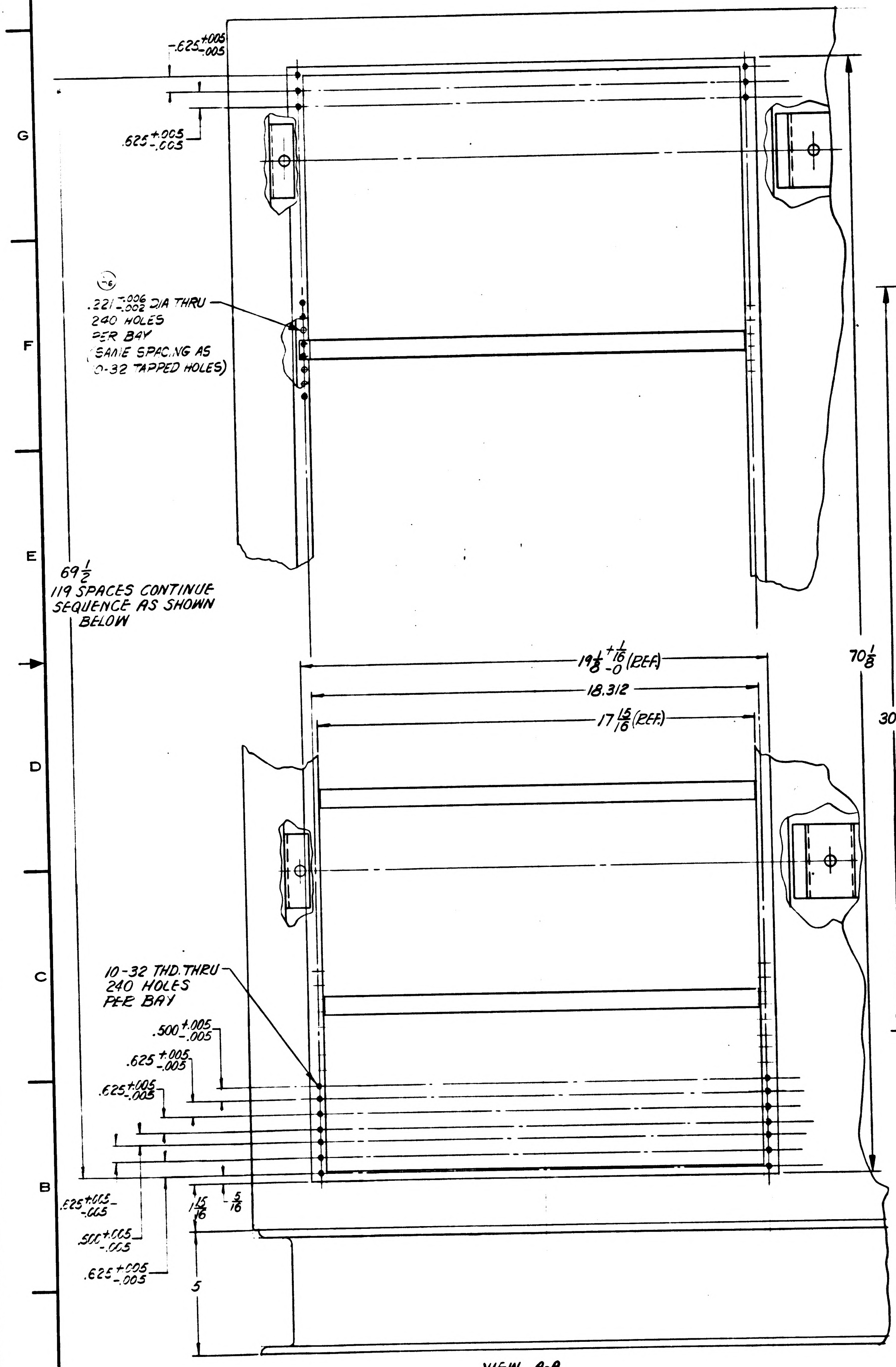
SEE SHEET 2 FOR VIEW A-A & SECTION A-A
SEE SHEET 3 FOR SECTION B-B
SEE SHEET 4 FOR SECTION D-D
SEE SHEET 5 FOR VIEW B & SECTION C-C

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. [illegible] DATE [illegible]

1900031		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/32 -1/32 DECIMALS +.010 -.010 ANGLES +2° -2°	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	Ⓐ MANNED SPACECRAFT CENTER HOUSTON, TEXAS
NEXT ASSY	USED ON	DO NOT SCALE THIS DRAWING	DRAWN E. LITZOW DATE 3-26-63 CHECKED APPROVAL W. B. Pierce 3-28-63 APPROVAL 3-28-63	CABINET ASSY. BASIC (APOLLO OPTICS-INERTIAL ANALYZER)
APPLICATION		MATERIAL ▷ SEE SHEET 5	NASA APPROVAL 4-24-63 MIT APPROVAL	CODE IDENT NO / SIZE E / 1900007
		CONTRACT NAS9-497		SCALE 1/8 / SHEET [illegible]

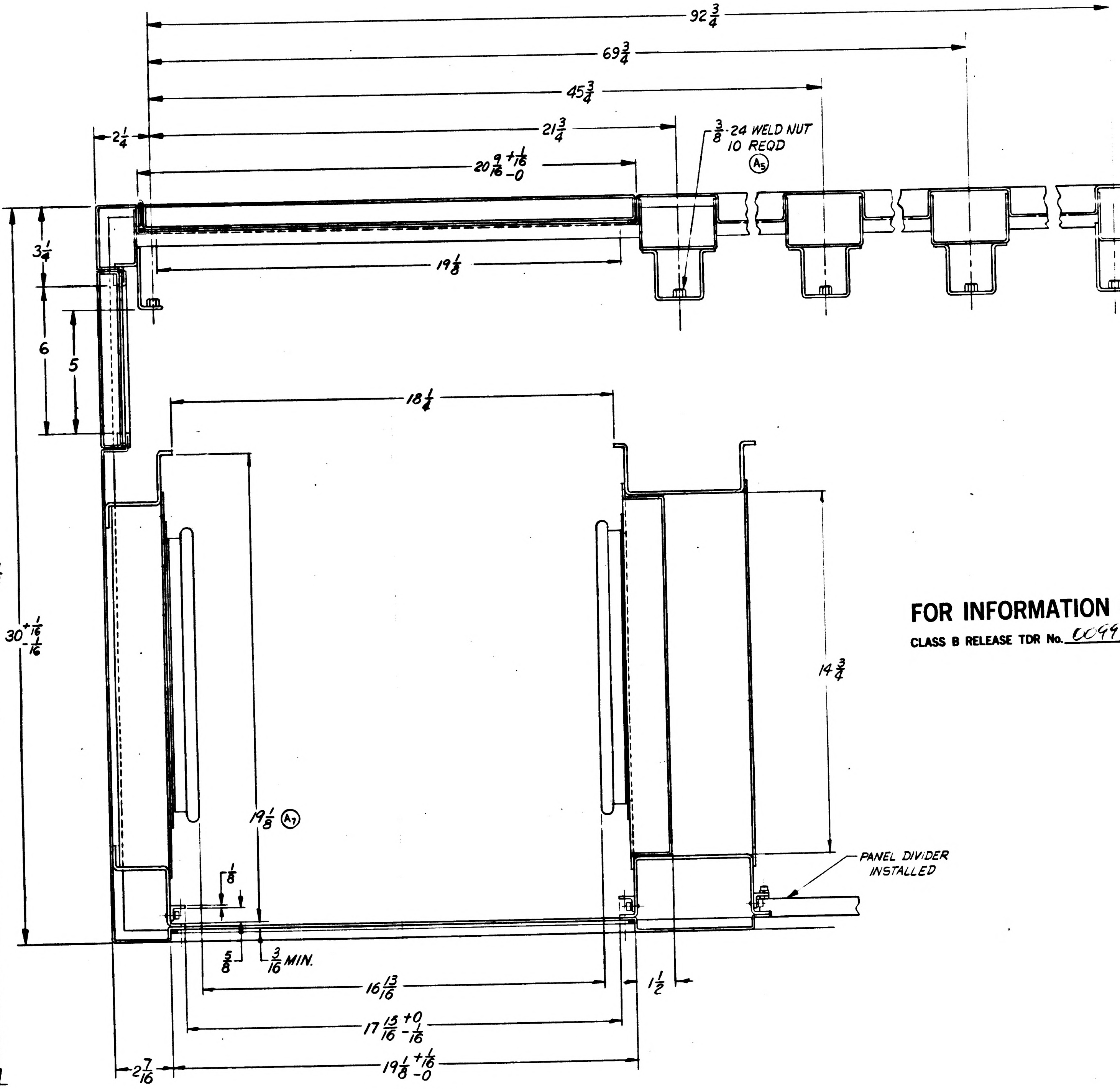
1900007 A B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A₁	A-1 F-2 F-8 C-4	(1) TITLE WAS (APOLLO GSE CONTROL CONSOLE) (5) ADDED $\frac{3}{8}$-24 WELD NUTS AND BRACKETS (6) ADDED .221 $^{+.006}_{-.002}$ DIA HOLES AND PANEL DIVIDER SUPPORT BRACKET (7) WAS 19 REV. STATUS CHANGED	D.C. 51421	9 APR 63	



$-.625^{+.005}_{-.005}$
$.625^{+.005}_{-.005}$
⑥
$.221^{+.006}_{-.002}$ DIA THRU
240 HOLES
PER BAY
(SAME SPACING AS
10-32 TAPPED HOLES)
$69\frac{1}{2}$
119 SPACES CONTINUE
SEQUENCE AS SHOWN
BELOW
$19\frac{1}{8}{}^{+\frac{1}{16}}_{-0}$ (REF.)
18.312
$17\frac{15}{16}$ (REF.)
$70\frac{1}{8}$
$30^{+\frac{1}{16}}_{-\frac{1}{16}}$
10-32 THD. THRU
240 HOLES
PER BAY
$.500^{+.005}_{-.005}$
$.625^{+.005}_{-.005}$
$.625^{+.005}_{-.005}$
$.625^{+.005}_{-.005}$
$.500^{+.005}_{-.005}$
$.625^{+.005}_{-.005}$
$1\frac{15}{16}$
$\frac{5}{16}$
5

VIEW A-A



$92\frac{3}{4}$
$69\frac{3}{4}$
$45\frac{3}{4}$
$21\frac{3}{4}$
$2\frac{1}{4}$
$20\frac{9}{16}{}^{+\frac{1}{16}}_{-0}$
$\frac{3}{8}$-24 WELD NUT
10 REQD
A5
$3\frac{1}{4}$
$19\frac{1}{8}$
6
5
$18\frac{1}{4}$
$14\frac{3}{4}$
$19\frac{1}{8}$ A7
PANEL DIVIDER
INSTALLED
$\frac{1}{8}$
$\frac{5}{8}$
$\frac{3}{16}$ MIN.
$16\frac{13}{16}$
$1\frac{1}{2}$
$17\frac{15}{16}{}^{+0}_{-\frac{1}{16}}$
$19\frac{1}{8}{}^{+\frac{1}{16}}_{-0}$
$2\frac{7}{16}$

SECTION A-A

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN
APPLICATION		MATERIAL	ACSP PN
		CONTRACT NAS9-497	DRAWN E. LITZOW DATE 3-26-63 3-28-63 CHECKED APPROVAL 3-28-63 APPROVAL 28 MAR 63 NASA APPROVAL MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

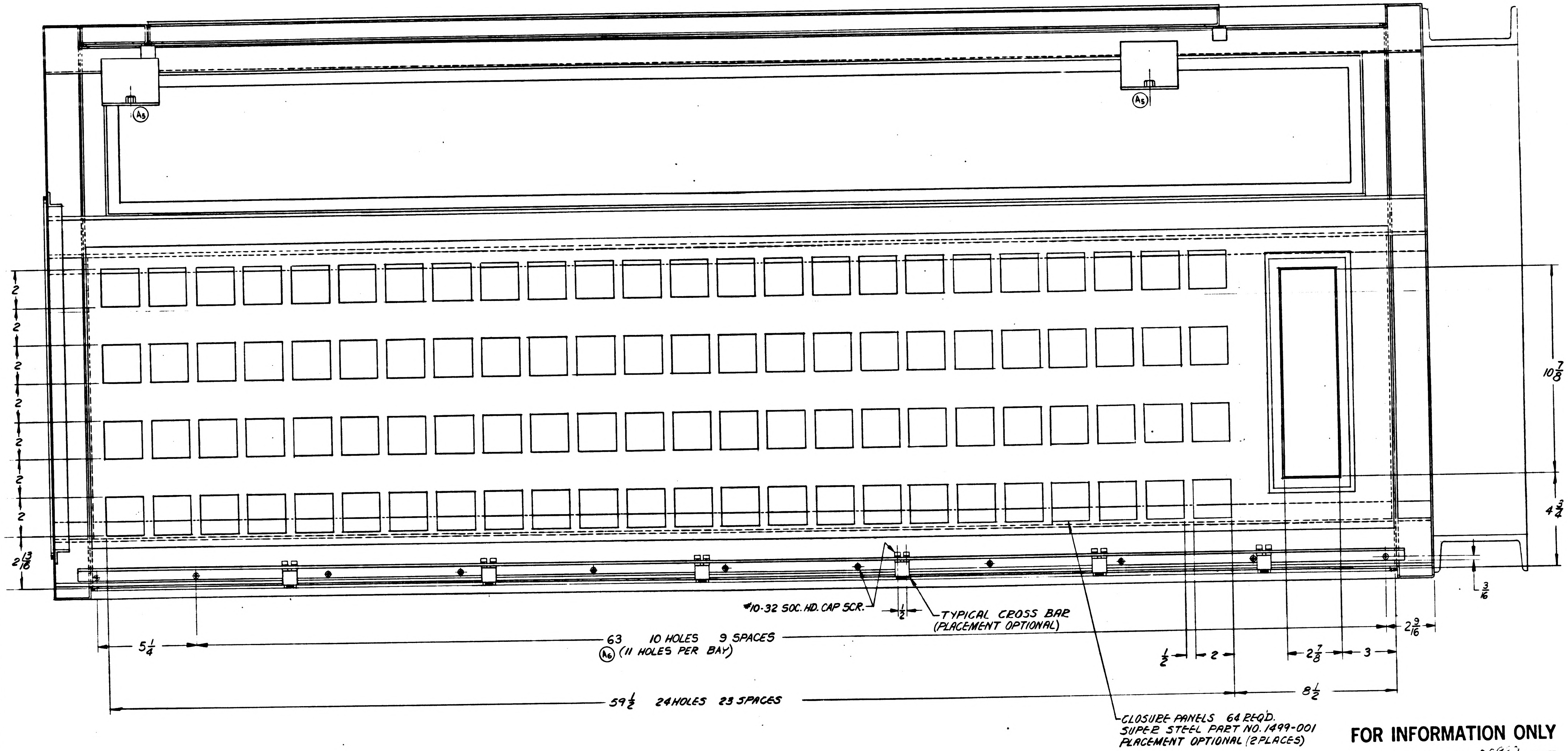
CABINET ASSY. BASIC
(APOLLO OPTICS-INERTIAL ANALYZER)

CODE IDENT NO.	SIZE	
	E	1900007
SCALE HALF		SHEET 2 OF 2

1900007

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A,	A-1 F-3&5 B-5	(1) TITLE WAS (APOLLO GSE CONTROL CONSOLE) (5) ADDED WELD NUTS AND BRACKETS (6) ADDED PANEL DIVIDER SUPPORT BRACKET AND MOUNTING HOLES REV STATUS CHG'D	D.C. 51421	9 APR 63	



A5
A5
2
2
2
2
2
2
2
2 13/16
10 7/8
4 3/4
3/16
10-32 SOC. HD. CAP SCR.
1/2
TYPICAL CROSS BAR (PLACEMENT OPTIONAL)
5 1/4
63 10 HOLES 9 SPACES
A6 (11 HOLES PER BAY)
1/2
2
2 7/8
3
2 9/16
8 1/2
59 1/2 24 HOLES 23 SPACES
CLOSURE PANELS 64 REQ'D.
SUPER STEEL PART NO. 1499-001
PLACEMENT OPTIONAL (2 PLACES)

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00099 DATE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

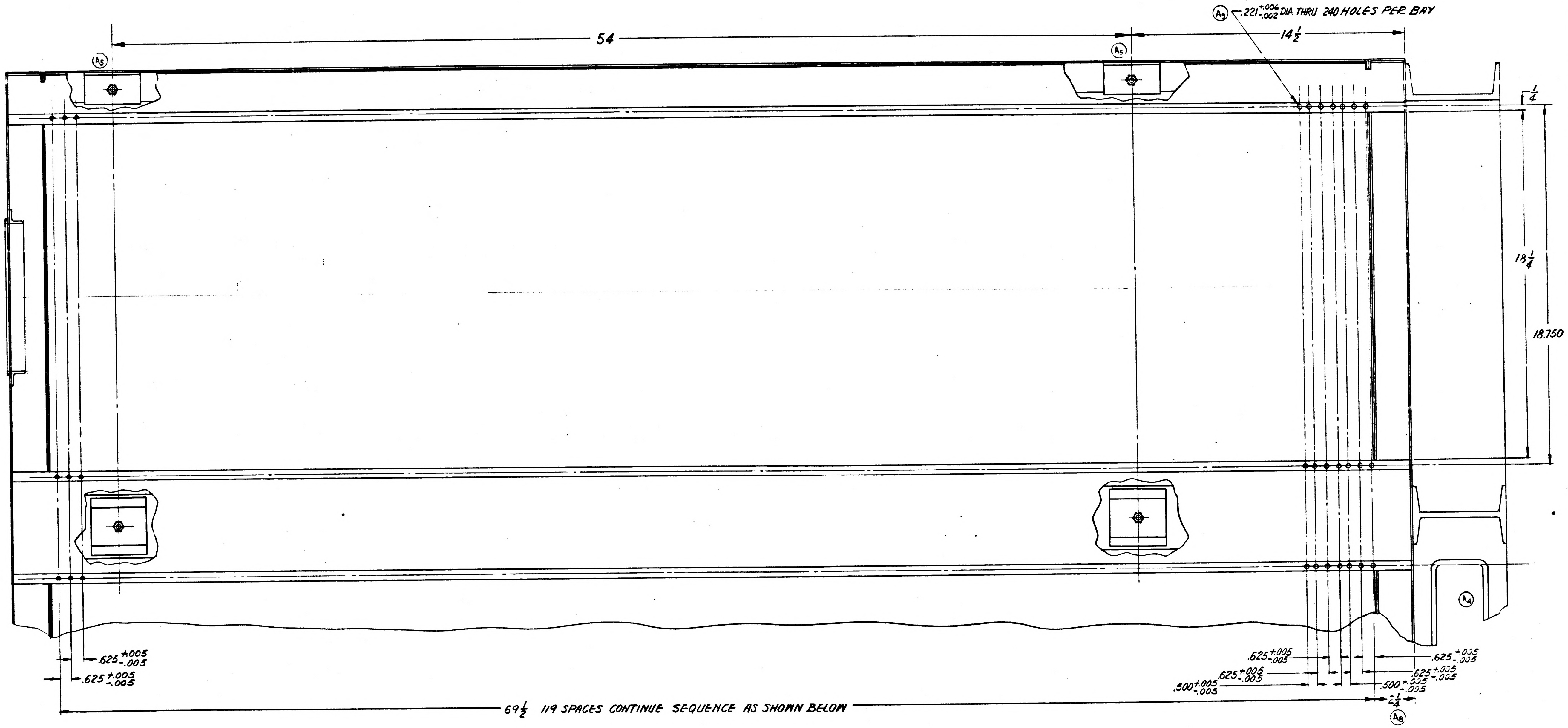
AC SPARK PLUG DIVISION GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 3-26-63
CHECKED
APPROVAL 3-26-63
APPROVAL 28 MAR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSY BASIC
(APOLLO OPTICS-INERTIAL ANALYZER)
(SECTION B-B)

CODE IDENT NO.
SIZE E
1900007
SCALE HALF
SHEET 3 OF 5

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A1	A-1 C-1 F-3&8 B-1 F-2	(1)TITLE WAS "APOLLO GSE CONTROL CONSOLE" (4)ADDED BASE OPENING (5)ADDED WELD NUTS AND BRACKETS (8)WAS 2 (9)WAS 10-32 THD REVISION STATUS CHANGED	D.C. 51421	9 APR 63	



A5
A5
A9 .221 +.006 -.002 DIA THRU 240 HOLES PER BAY
54
14½
¼
18¼
18.750
A4
.625 +.005 -.005
.625 +.005 -.005
.625 +.005 -.005
.625 +.005 -.003
.500 +.005 -.005
.625 +.005 -.005
.625 +.005 -.005
.500 +.005 -.005
2¼
A8
69½ 119 SPACES CONTINUE SEQUENCE AS SHOWN BELOW

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00666 **DATE** 2 Apr. 63

NEXT ASSY / USED ON APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± — DO NOT SCALE THIS DRAWING MATERIAL	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	CONTRACT NAS9-497	DRAWN E. LITZOW DATE 3-26-63 CHECKED 3-28-63 APPROVAL 3-25-63 APPROVAL 28 MAR 63 NASA APPROVAL 4-24-63 MIT APPROVAL	CABINET ASSY BASIC (APOLLO OPTICS-INERTIAL ANALYZER) (SECTION D-D)
			CODE IDENT NO — SIZE E — 1900007 SCALE HALF — SHEET

1900007

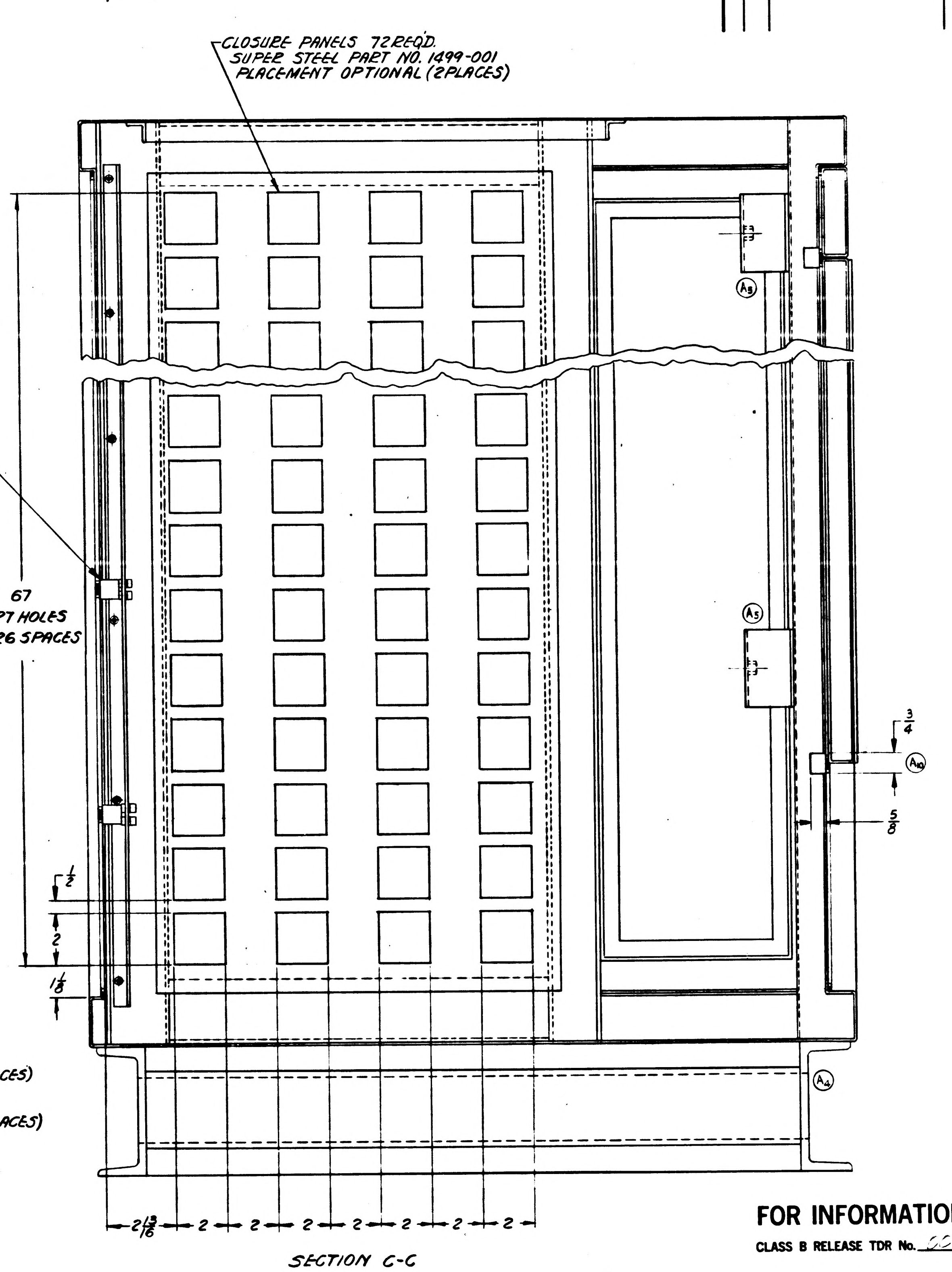
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A,	A-1 C-2 E&F-2 F-6 D-1	(1)TITLE WAS "(APOLLO GSE CONTROL CONSOLE)" (4)ADDED BASE OPENING (5)ADDED WELD NUTS AND BRACKETS (6)ADDED PANEL DIVIDER SUPPORT BRACKET-DIVIDERS WERE SUPER STL NO. 1485-001(10) $\frac{5}{8}\times\frac{3}{4}$ BAR WAS TEE SHAPE REV STATUS CHANGED	D.O. 51421	9 APR 63	

REQUIREMENTS:
ELECTRO-INTERFERENCE ENVIROMENT CONTROL REQUIREMENT. THE SHIELDING MATERIALS AND CONSTRUCTION SHALL PROVIDE AN ATTENUATION TO ELECTROMAGNETIC EMANATIONS THAT IS ABOVE 60 db FOR MAGNETIC FIELDS ABOVE 150 KC & BELOW 1000 MC.

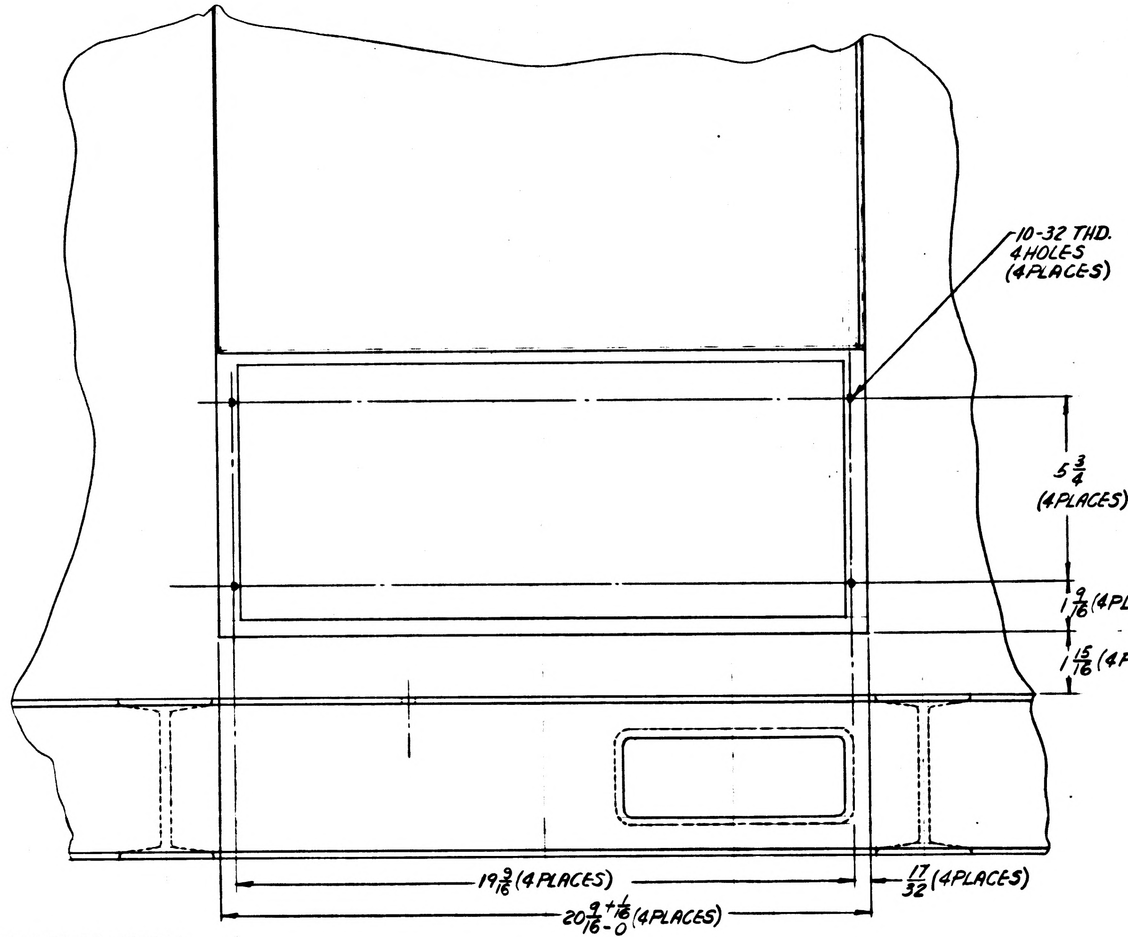
▷ MATERIAL:
QQ-S-698 STEEL SHEET AND STRIP, LOW CARBON.
TYPE COLD ROLLED, COMMERCIAL QUALITY.
16 GAGE OR LARGER THRUOUT.
ASTM-A36 STRUCTURAL SECTIONS.

FINISH:
PREPARE ALL EXTERNAL & INTERNAL SURFACES EXCEPT TAPPED HOLES WITH PHOSPHATE COATING PER MIL-P-50002. APPLY ZINC CHROMATE PRIMER PER MIL-P-8585 AND PER MIL-F-14072 APPLY 2 COATS OF FEDERAL SPECIFICATION TT-E-529 CLASS B SEMI GLOSS ENAMEL, DARK GRAY COLOR 26251 OF MIL-STD. 595.

WELDING:
WELDED CONSTRUCTION


CLOSURE PANELS 72 REQ'D.
SUPER STEEL PART NO. 1499-001
PLACEMENT OPTIONAL (2 PLACES)
A6
PANEL DIVIDERS 28 REQ'D. PER CABINET
PLACEMENT OPTIONAL
A5
67
27 HOLES
26 SPACES
3/4
A10
5/8
1/2
2
1 1/8
A4
2 13/16
2
2
2
2
2
2
2
2

SECTION C-C


10-32 THD.
4 HOLES
(4 PLACES)
5 3/4
(4 PLACES)
1 9/16 (4 PLACES)
1 15/16 (4 PLACES)
19 9/16 (4 PLACES)
17/32 (4 PLACES)
20 9/16 +1/16 -0 (4 PLACES)

VIEW B

ORIGINAL SOURCE OF SUPPLY
SUPER STEEL PRODUCTS CO.
1244 N. FOURTH ST.
MILWAUKEE 12, WISCONSIN
PART NO. 1495-A

MAKE FROM (PART NO. 1495-A)

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00966 DATE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

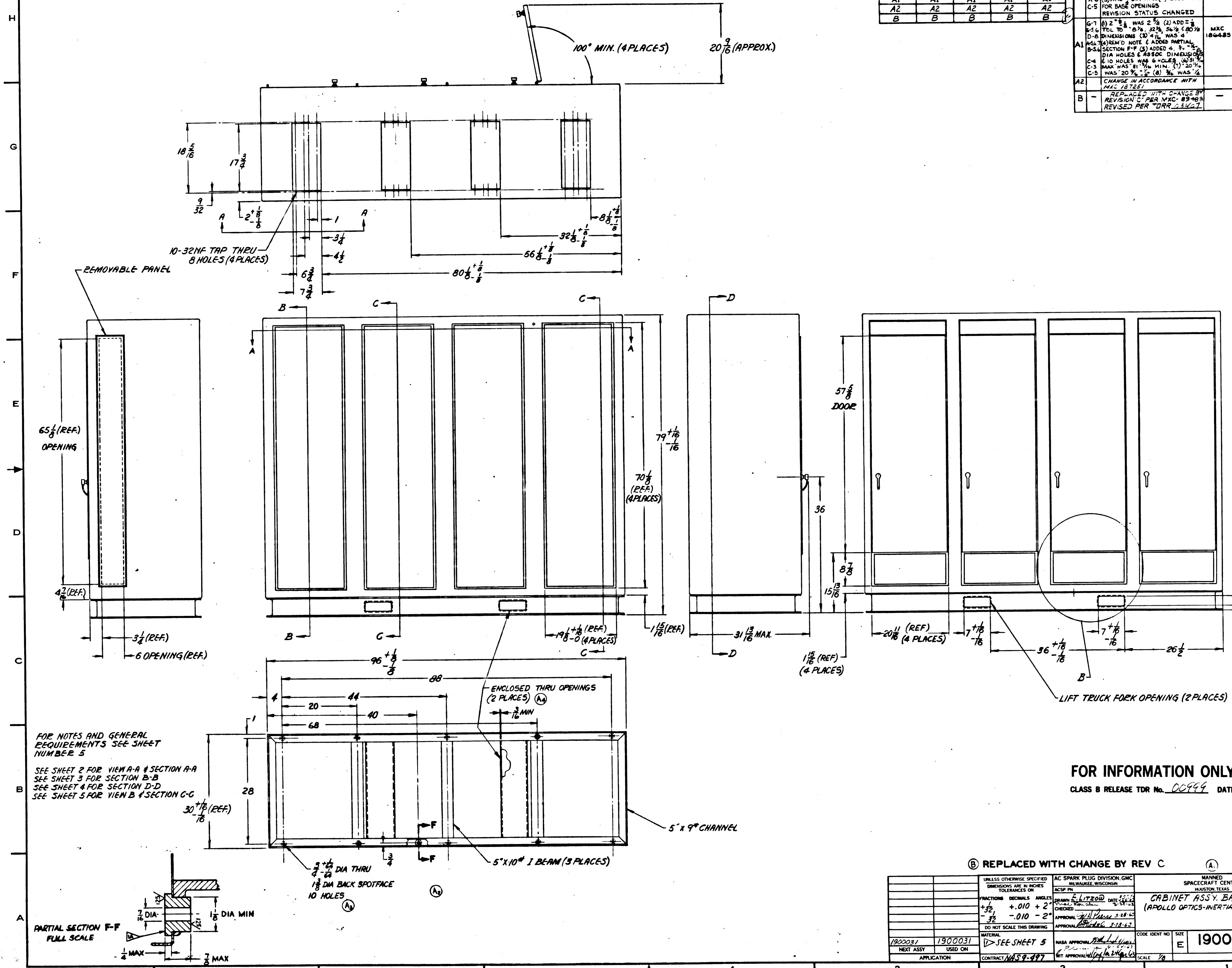
AC SPARK PLUG DIVISION. GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 3-26-63
CHECKED
APPROVAL 3-26-63
APPROVAL 28 MAR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS
CABINET ASSY. BASIC
(APOLLO OPTICS-INERTIAL ANALYZER)
SECTION & VIEW
CODE IDENT NO
SIZE E
1900007
SCALE
SHEET 5 OF 5

REVISION STATUS OF SHEETS				
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5
A	A	A	A	A
A1	A1	A1	A1	A1
A2	A2	A2	A2	A2
B	B	B	B	B

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A-1 A-6 A-6 C-5	(1) TITLE WAS "APOLLO GSE CONTROL CONSOLE" (2) ADDED 7/16 DIA THRU (3) WAS 3/4 DIA THRU (4) ADDED INFO FOR BASE OPENINGS REVISION STATUS CHANGED	D.O. 51421	9 APR 63	
A1	G-7 G-5,6 D-8 A-5,6,7 B-5,6 C-4 C-3 C-5	(1) 2 +1/8 -1/8 WAS 2 5/8 (2) ADD ±1/8 TOL TO 8 1/8, 32 1/8, 56 1/8 & 80 1/8 DIMENSIONS (3) 4 7/16 WAS 4 (4) REM'D NOTE & ADDED PARTIAL SECTION F-F (5) ADDED 4, 3/4 +1/64 -1/64 DIA HOLES & ASSOC DIMENSIONS & 10 HOLES WAS 6 HOLES (6) 31 13/16 MAX WAS 31 13/16 MIN. (7) 20 11/16 WAS 20 9/16 +1/16 -1/16 (8) 3/16 WAS 1/4	MXC 186485	15 MAY 63	R.J.F. PF
A2		CHANGE IN ACCORDANCE WITH MXC 187251		21 JUN 63	
B	–	REPLACED WITH CHANGE BY REVISION C PER MXC-89483 REVISED PER TDRR 03407	–	3 SEPT 65	



100° MIN. (4 PLACES)
20 9/16 (APPROX.)
18 5/16
17 3/4
9/32
A
2 +1/8 -1/8
1
A
3 1/4
4 1/2
6 3/4
7 3/4
10-32NF TAP THRU 8 HOLES (4 PLACES)
8 1/8 +1/8 -1/8
32 1/8 +1/8 -1/8
56 1/8 +1/8 -1/8
80 1/8 +1/8 -1/8
REMOVABLE PANEL
65 1/8 (REF.) OPENING
4 7/16 (REF.)
3 1/4 (REF.)
6 OPENING (REF.)
B
C
C
B
A
A
79 +1/16 -1/16
70 1/8 (REF.) (4 PLACES)
19 1/8 +1/8 -0 (REF.) (4 PLACES)
1 15/16 (REF.)
B
C
C
D
36
31 13/16 MAX.
D
57 5/8 DOOR
8 7/8
15 13/16
1 15/16 (REF) (4 PLACES)
20 11/16 (REF) (4 PLACES)
7 +1/16 -1/16
36 +1/16 -1/16
7 +1/16 -1/16
26 1/2
2 1/2
1 1/4
B
LIFT TRUCK FORK OPENING (2 PLACES)
96 +1/8 -1/8
88
4
20
44
40
68
1
ENCLOSED THRU OPENINGS (2 PLACES) (A1)
3/16 MIN
28
30 +1/16 -1/16 (REF.)
F
F
3/4
5"x 9# CHANNEL
5"x10# I BEAM (3 PLACES)
3/4 +1/64 -1/64 DIA THRU
1 3/8 DIA BACK SPOTFACE
10 HOLES (A1)
(A1)
7/16 DIA
1 1/8 DIA MIN
.621
1/4 MAX
7/8 MAX
PARTIAL SECTION F-F FULL SCALE

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET NUMBER 5

SEE SHEET 2 FOR VIEW A-A & SECTION A-A
SEE SHEET 3 FOR SECTION B-B
SEE SHEET 4 FOR SECTION D-D
SEE SHEET 5 FOR VIEW B & SECTION C-C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

Ⓑ **REPLACED WITH CHANGE BY REV** C

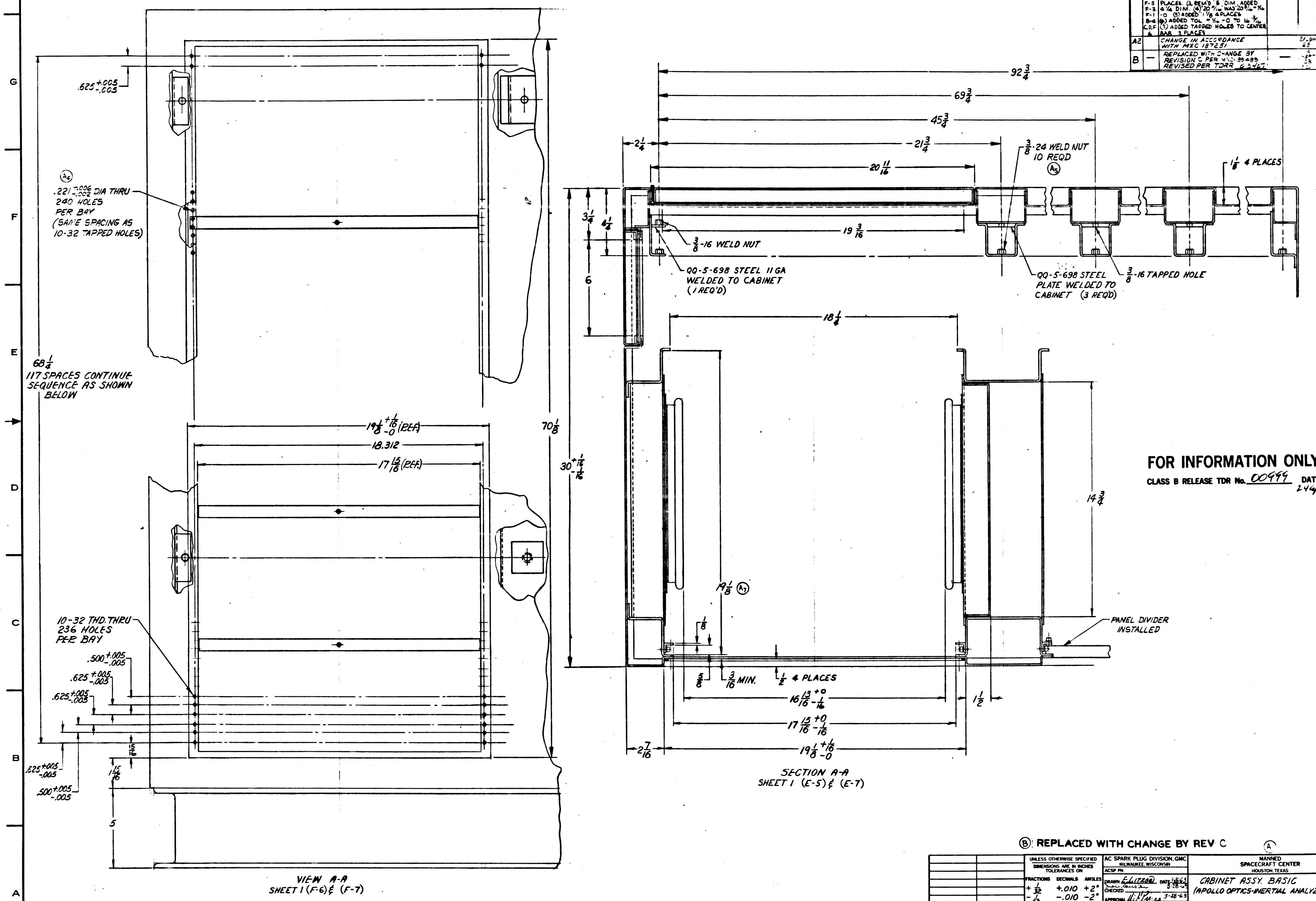
(A1)

1900031 NEXT ASSY	1900031 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +1/32 -1/32 DECIMALS +.010 -.010 ANGLES +2° -2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN E. LITZOW DATE 3-26-63 CHECKED 3-27-63 APPROVAL W.H. Pierce 3-28-63 APPROVAL 3-28-63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	CABINET ASS'Y. BASIC (APOLLO OPTICS-INERTIAL ANALYZER)
APPLICATION		MATERIAL ⊳ SEE SHEET 5 CONTRACT NAS9-497	NASA APPROVAL 4-24-63 MIT APPROVAL 24 Apr 63	CODE IDENT NO. SCALE 1/8	SIZE E 1900007 SHEET 1 OF 5

1900007 B

INCHES
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A	A-1 F-2 F-8 C-4	(1)TITLE WAS "APOLLO GSE CONTROL CONSOLE" (5)ADDED $\frac{3}{8}$-24 WELD NUTS AND BRACKETS (6)ADDED $.221^{+.006}_{-.002}$ DIA HOLES AND PANEL DIVIDER SUPPORT BRACKET (7)WAS 19 REV. STATUS CHANGED	D.C. 51421	9 APR 63	
A1	B,C,E G-8,6 C-4 F-5 F-3 F-1 B-4 C,D,F 6	(1) REM'D 2 HOLES UPPER BAY & 2 HOLES FROM LOWER BAY & REVISED ASSOC. DIM: "15/16" WAS "5/16", REM'D .625±.005, "68 1/4" WAS "69 1/2", "117 SPACES" WAS "119 SPACES" "236 HOLES" WAS "240 HOLES" (2) ADDED 1/2 4 PLACES. (3) REM'D "5" DIM, ADDED 4 1/4 DIM. (4) "20 11/16" WAS "20 9/16 +1/16 -0" (5) ADDED 1 1/8 4 PLACES (6) ADDED TOL +1/16 -0 TO 16 13/16 (7) ADDED TAPPED HOLES TO CENTER BAR 3 PLACES	MXC 186485	15 MAY 63	RJF
A2		CHANGE IN ACCORDANCE WITH MXC 187251		21 JUN 63	
B	—	REPLACED WITH CHANGE BY REVISION C PER MXC-39483 REVISED PER TDRR 62467	—		



.625 +.005 -.005
.221 +.006 -.002 DIA THRU 240 HOLES PER BAY (SAME SPACING AS 10-32 TAPPED HOLES)
68 1/4
117 SPACES CONTINUE SEQUENCE AS SHOWN BELOW
70 1/8
19 1/8 +1/16 -0 (REF)
18.312
17 15/16 (REF)
10-32 THD. THRU 236 HOLES PER BAY
.500 +.005 -.005
.625 +.005 -.005
.625 +.005 -.005
15/16
.625 +.005 -.005
1 1/16
.500 +.005 -.005
5
VIEW A-A
SHEET 1 (F-6) & (F-7)
92 3/4
69 3/4
45 3/4
2 1/4
21 3/4
20 11/16
3/8-24 WELD NUT 10 REQD
1 1/8 4 PLACES
3 1/4
4 1/4
19 3/16
3/8-16 WELD NUT
6
QQ-S-698 STEEL 11 GA WELDED TO CABINET (1 REQ'D)
QQ-S-698 STEEL PLATE WELDED TO CABINET (3 REQ'D)
3/8-16 TAPPED HOLE
18 1/4
30 +1/16 -1/16
14 3/4
19 1/8
PANEL DIVIDER INSTALLED
1/8
5/8
3/16 MIN.
1/2 4 PLACES
16 13/16 +0 -1/16
17 13/16 +0 -1/16
1 1/2
2 7/16
19 1/8 +1/16 -0
SECTION A-A
SHEET 1 (E-5) & (E-7)

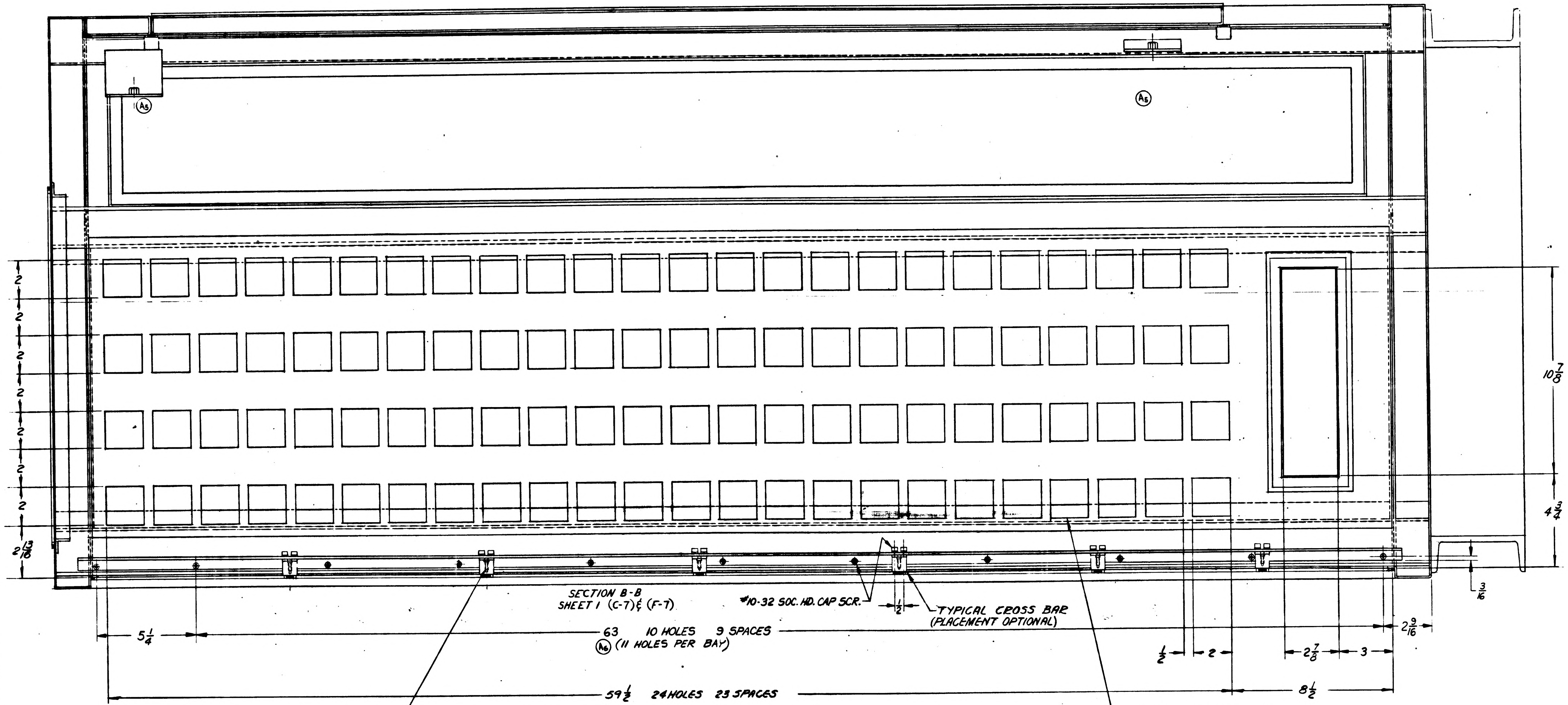
FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

Ⓑ REPLACED WITH CHANGE BY REV C

NEXT ASSY / USED ON APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $\pm\frac{1}{32}$ DECIMALS +.010 −.010 ANGLES +2° −2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	MATERIAL	DRAWN E. LITZOW DATE 3-26-63 CHECKED 3-28-63 APPROVAL 3-28-63 APPROVAL 28 MAR 63	CABINET ASSY. BASIC (APOLLO OPTICS-INERTIAL ANALYZER)	
	CONTRACT NAS9-497	NASA APPROVAL MIT APPROVAL 24 Apr 63	CODE IDENT NO. SCALE HALF	SIZE E 1900007 SHEET 2 OF 2

1900007 B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A-1 F-3&8 B-5	(1) TITLE WAS "(APOLLO GSE CONTROL CONSOLE)" (5) ADDED WELD NUTS AND BRACKETS (6) ADDED PANEL DIVIDER SUPPORT BRACKET AND MOUNTING HOLES REV STATUS CHG'D	D.O. 51421	9 APR 63	
A1	C-2 THRU 7	(1) ADDED 10-32 TAPPED HOLE TO EACH CROSS BAR, 6 PLACES & ADDED ASSOC. NOTE CALLOUT	MXC 186485	15 MAY 63	RJF PF
A2		CHANGE IN ACCORDANCE WITH MXC-187251		21 JUN 63	EFS
B	—	REPLACED WITH CHANGE BY REVISION "C" PER MXC-189483 REVISED PER TDRR 2342	—	3 SEPT. 63	PM



Ⓜ
A5
A6
2
2
2
2
2
2
2
$2\frac{13}{16}$
$10\frac{7}{8}$
$4\frac{3}{4}$
$\frac{3}{16}$
SECTION B-B
SHEET 1 (C-7) & (F-7)
#10-32 SOC. HD. CAP SCR.
$\frac{1}{2}$
TYPICAL CROSS BAR
(PLACEMENT OPTIONAL)
$5\frac{1}{4}$
63 10 HOLES 9 SPACES
A6 (11 HOLES PER BAY)
$2\frac{9}{16}$
$\frac{1}{2}$
2
$2\frac{7}{8}$
3
$59\frac{1}{2}$ 24 HOLES 23 SPACES
$8\frac{1}{2}$
CLOSURE PANELS 64 REQ'D.
SUPER STEEL PART NO. 1499-001
PLACEMENT OPTIONAL (2 PLACES)
$\frac{1}{4}$ DIA C'BORE $\frac{1}{8}$ DEEP
10-24 UNC 2B THREAD $\frac{1}{2}$ DEEP MIN
1 TAPPED HOLE AT CENTER OF EACH
FRONT MOUNTED CROSS-BAR

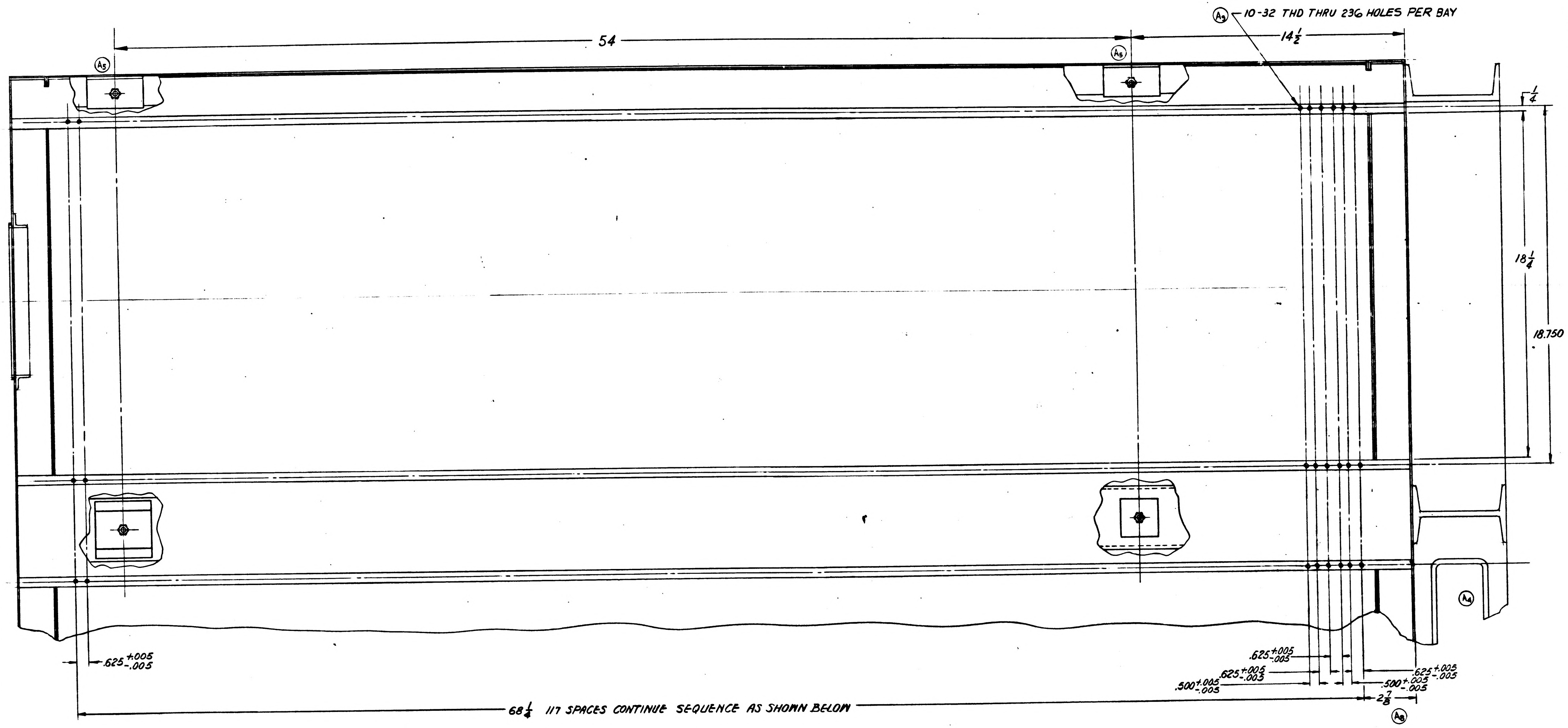
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

Ⓑ REPLACED WITH CHANGE BY REV C

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $\pm\frac{1}{32}$ DECIMALS +.010 −.010 ANGLES +2° −2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN E. LITZOW DATE 3-26-63 CHECKED 3-28-63 APPROVAL A.H. Pierce 3-28-63 APPROVAL 28 MAR 63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSY. BASIC (APOLLO OPTICS-INERTIAL ANALYZER) (SECTION B-B)
APPLICATION		MATERIAL — CONTRACT NAS9-497	NASA APPROVAL 4-24-63 4-24-63 MIT APPROVAL 24 Apr 63	CODE IDENT NO. SIZE E 1900007 SCALE HALF SHEET 3 OF 5

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
A	A-1 C-1 F-3&8 B-1 F-2	(1) TITLE WAS "(APOLLO GSE CONTROL CONSOLE)" (4) ADDED BASE OPENING (5) ADDED WELD NUTS AND BRACKETS (8) WAS 2 (9) WAS 10-32 THD REVISION STATUS CHANGED	D.C. 51421	9 APR 63	
A1	F-2,8 C-2-8	(1) REM'D 2 HOLES FROM UPPER & 2 HOLES FROM LOWER EXTRENITY ON EACH BAY & REVISED ASSOC DIMENSIONS "2 7/8" WAS 2 1/4 REM'D .625±.005 (2 PLACES) "68 1/4" WAS 69 1/2", "117 SPACES" WAS "119 SPACES", "236 HOLES" WAS "240 HOLES".	MXC 186485	15 MAY 63	RJF
A2		CHANGE IN ACCORDANCE WITH MXC 187251		2 [illegible] 63	
B	—	REPLACED WITH CHANGE BY REVISION C PER MXC-89483 REVISED PER TDRR 03447	—	[illegible]	



A9
10-32 THD THRU 236 HOLES PER BAY
54
14½
A5
A5
¼
18¼
18.750
A4
.625 +.005 -.005
.625 +.005 -.005
.625 +.005 -.005
.500 +.005 -.005
.625 +.005 -.005
.500 +.005 -.005
68¼ 117 SPACES CONTINUE SEQUENCE AS SHOWN BELOW
2⅞
A8

SECTION D-D
SHEET 1 (C-4) (F-4)

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06999 DATE 24 Apr 63

Ⓑ REPLACED WITH CHANGE BY REV C

Ⓐ

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{32}$	+.010	+2°
$-\frac{1}{32}$	-.010	-2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 3-26-63
CHECKED 3-28-63
APPROVAL 3-28-63
APPROVAL 28 MAR 63
NASA APPROVAL
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSY. BASIC
(APOLLO OPTICS-INERTIAL ANALYZER)
(SECTION D-D)

CODE IDENT NO.
SIZE E
1900007
SCALE HALF
SHEET 4 OF 5

1900007 B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A-1 C-2 E&F-2 F-6 D-1	(1)TITLE WAS "(APOLLO GSE CONTROL CONSOLE)" (4)ADDED BASE OPENING (5)ADDED WELD NUTS AND BRACKETS (6)ADDED PANEL DIVIDER SUPPORT BRACKET-DIVIDERS WERE SUPER STL NO. 1485-001(10) 5/8 x 3/4 BAR WAS "TEE" SHAPE REV STATUS CHANGED	D.O. 51421	9 APR 63	
A1	B-6 6-7 F-7	(1) "20 11/16" WAS "20 9/16 ± 1/8" (2) NOTE WAS "--- SHALL PROVIDE AN ATTENUATION TO ELECTRO-MAGNETIC EMANATIONS THAT IS ABOVE 60db FOR MAGNETIC FIELDS--" (3) NOTE WAS "PRIMER PER MIL-P-8585 AND PER MIL-F-14072 ----"	MXC 186485	15 MAY 63	RJF
A2		CHANGE IN ACCORDANCE WITH MXC 187251		2 JUL 63	EFS
B	—	REPLACED WITH CHANGE BY REVISION C PER MXC189483 REVISED PER TDRR 03407	—	3 SEP 63	

REQUIREMENTS:
ELECTRO-INTERFERENCE ENVIRONMENT CONTROL REQUIREMENT. THE SHIELDING MATERIALS AND CONSTRUCTION SHALL PROVIDE MEANS FOR ATTENUATION OF ELECTRMAGNETIC EMANATIONS FOR MAGNETIC FIELDS ABOVE 150 KC AND BELOW 1000 MC

MATERIAL:
QQ-S-698 STEEL, SHEET AND STRIP, LOW CARBON.
TYPE COLD ROLLED, COMMERCIAL QUALITY.
16 GAGE OR LARGER THRUOUT.
QQ-S-741 STRUCTURAL SECTIONS.

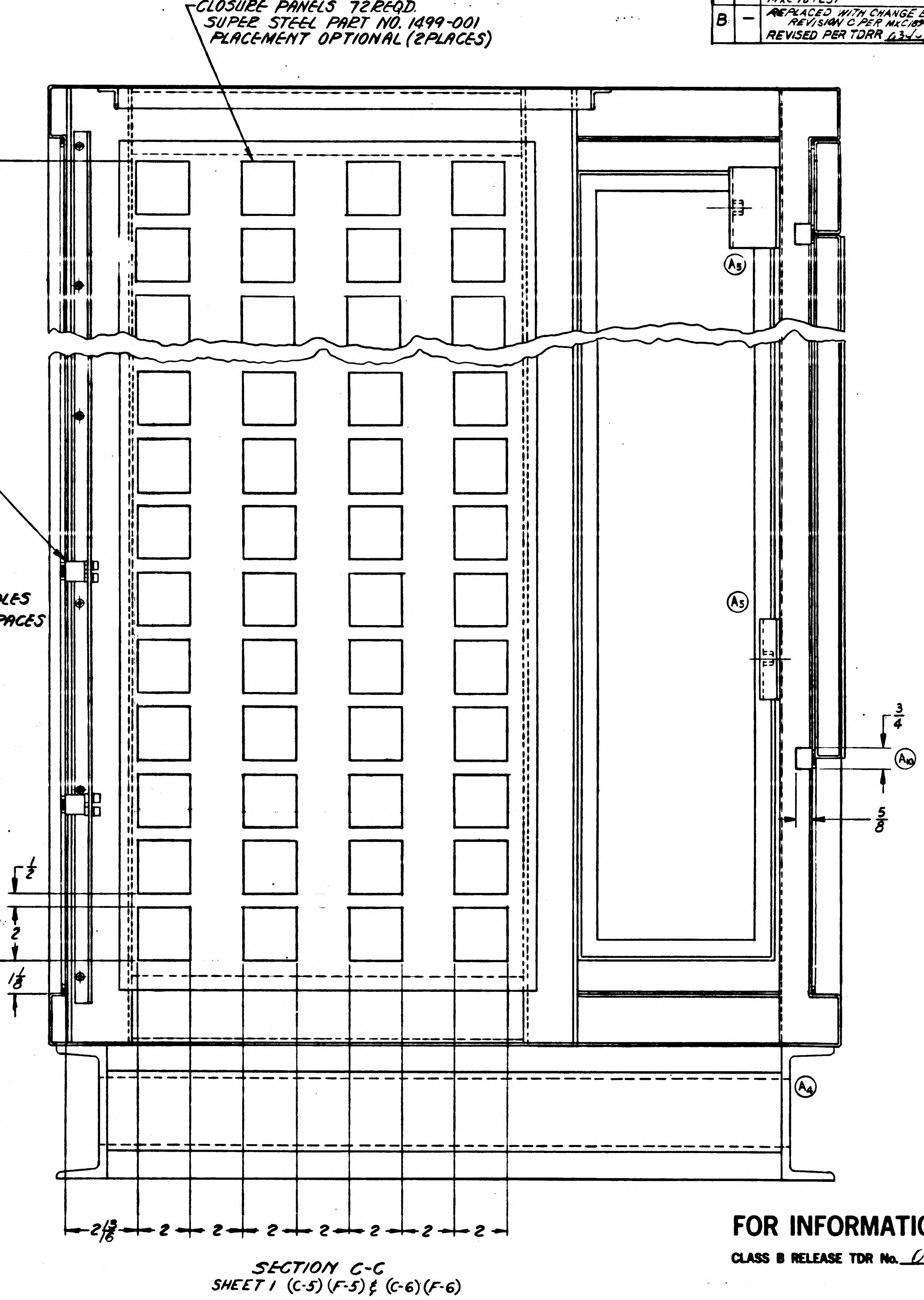
FINISH:
PREPARE ALL EXTERNAL & INTERNAL SURFACES EXCEPT TAPPED HOLES WITH PHOSPHATE COATING PER MIL-P-50002. APPLY ZINC CHROMATE PRIMER PER MIL-P-8585. PER MIL-F-14072 APPLY 2 COATS OF FEDERAL SPECIFICATION TT-E-529 CLASS B SEMI GLOSS ENAMEL, DARK GRAY COLOR 26251 OF FED-STD. 595.

ALTERNATE METHOD OF PRIMING SURFACES BEFORE FINISH PAINTING IS PER MIL-P-26915.

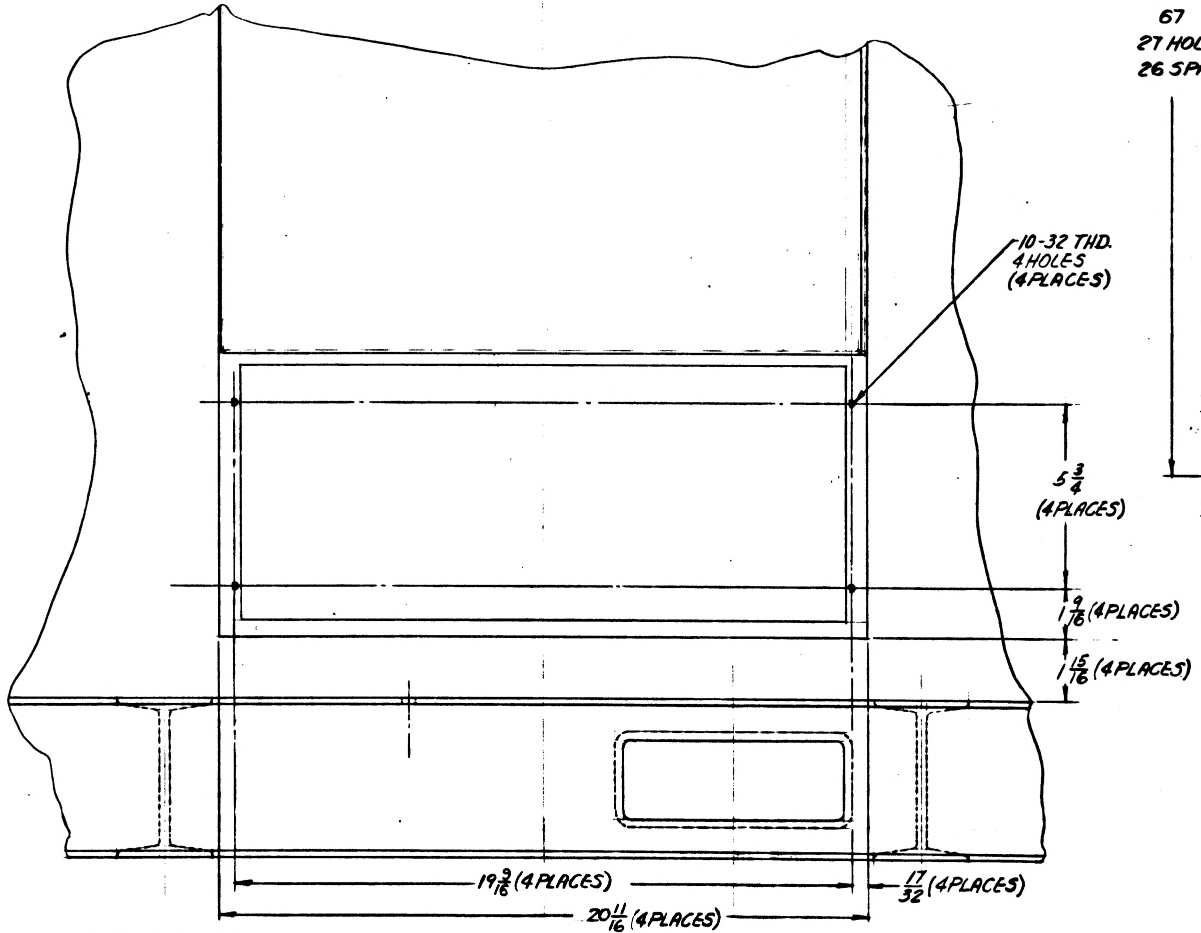
WELDING:
WELDED CONSTRUCTION

ALL THREADS SHALL BE OF CLASS 2 OR BETTER.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.


CLOSURE PANELS 72 REQD.
SUPER STEEL PART NO. 1499-001
PLACEMENT OPTIONAL (2 PLACES)
PANEL DIVIDERS 28 REQD. PER CABINET-
PLACEMENT OPTIONAL
67
27 HOLES
26 SPACES
1/2
2
1 1/8
3/4
5/8
2 1/8
2
2
2
2
2
2
2

SECTION C-C
SHEET 1 (C-5) (F-5) & (C-6) (F-6)


10-32 THD.
4 HOLES
(4 PLACES)
5 3/4
(4 PLACES)
1 9/16 (4 PLACES)
1 15/16 (4 PLACES)
19 3/16 (4 PLACES)
17/32 (4 PLACES)
20 11/16 (4 PLACES)

VIEW B
SHEET 1 (C-2) & (D-2)

ORIGINAL SOURCE OF SUPPLY
SUPER STEEL PRODUCTS CO.
1244 N. FOURTH ST.
MILWAUKEE 12, WISCONSIN
PART NO. 1495-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00944 DATE 2 Apr 63

Ⓑ **REPLACED WITH CHANGE BY REV C**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + 1/32 − 1/32 DECIMALS +.010 −.010 ANGLES +2° −2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS		
	DRAWN E. LITZOW DATE 3-26-63 CHECKED 3-28-63 APPROVAL 3-28-63 APPROVAL 28 MAR 63	CABINET ASSY. BASIC (APOLLO OPTICS-INERTIAL ANALYZER) SECTION & VIEW		
MATERIAL —	NASA APPROVAL 4/24/63 6-24-63	CODE IDENT NO.	SIZE E	1900007
CONTRACT NAS 9-497	MIT APPROVAL 24 Apr 63	SCALE HALF		SHEET 5 OF 5

NEXT ASSY	USED ON
APPLICATION	

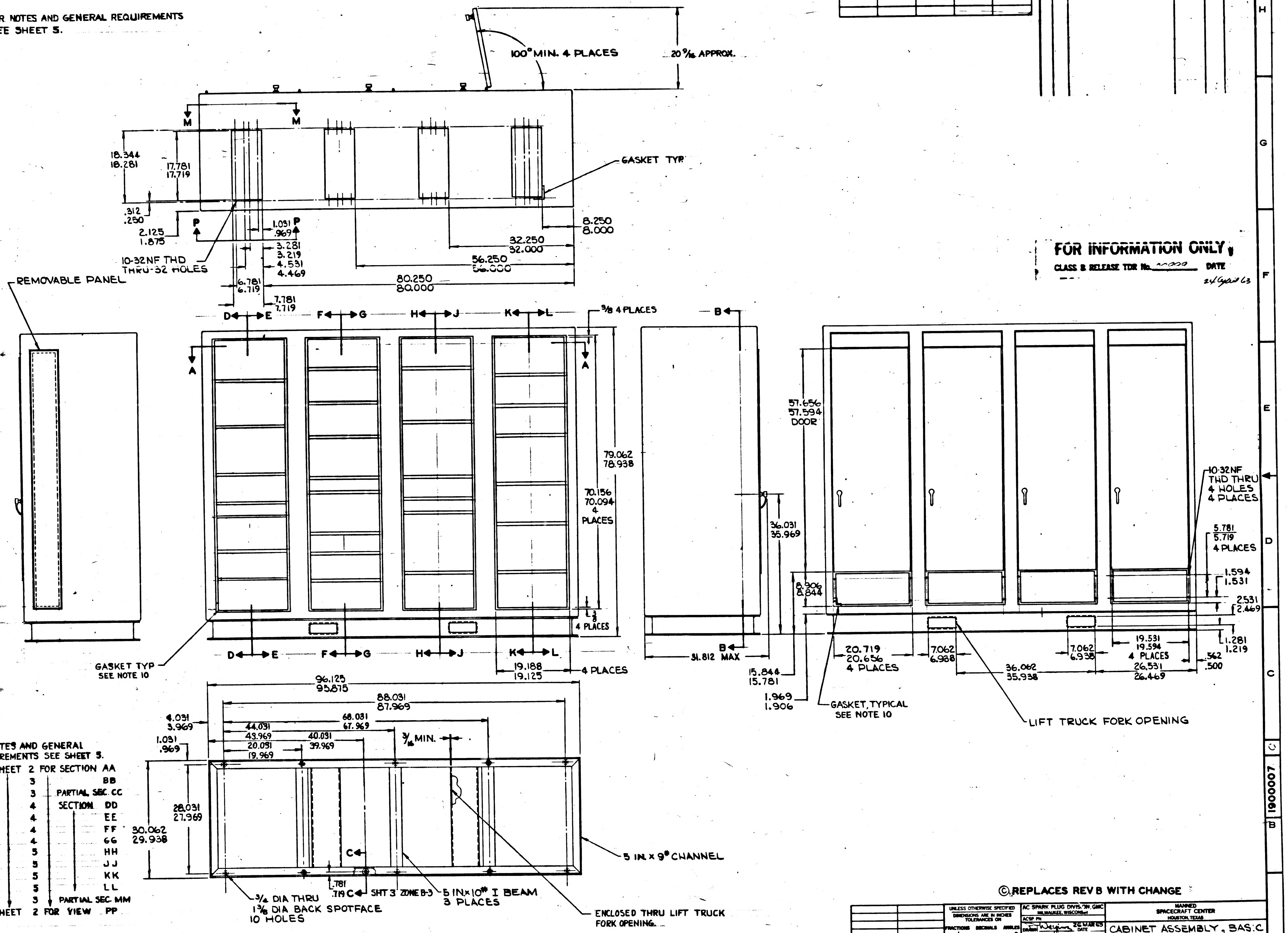
1900007 B

REVISION STATUS OF SHEETS				
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5
C	C	C	C	C

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MYC 183483	4 SEPT 63	T.P.

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.



100° MIN. 4 PLACES
20 9/16 APPROX.
M
M
18.344
18.281
17.781
17.719
GASKET TYP
.312
.250
2.125
1.875
P
1.031
.969
P
8.250
8.000
3.281
3.219
4.531
4.469
32.250
32.000
56.250
56.000
10-32NF THD THRU-32 HOLES
6.781
6.719
80.250
80.000
REMOVABLE PANEL
7.781
7.719
D
E
F
G
H
J
K
L
3/8 4 PLACES
B
A
A
57.656
57.594
DOOR
79.062
78.938
70.156
70.094
4 PLACES
36.031
35.969
10-32NF THD THRU 4 HOLES 4 PLACES
5.781
5.719
4 PLACES
8.906
8.844
1.594
1.531
2.531
2.469
1/8
4 PLACES
B
31.812 MAX
1.281
1.219
GASKET TYP
SEE NOTE 10
19.188
19.125
4 PLACES
20.719
20.656
4 PLACES
7.062
6.938
36.062
35.938
7.062
6.938
19.531
19.594
4 PLACES
26.531
26.469
.562
.500
15.844
15.781
1.969
1.906
GASKET, TYPICAL
SEE NOTE 10
LIFT TRUCK FORK OPENING
96.125
95.875
88.031
87.969
68.031
67.969
44.031
43.969
40.031
39.969
20.031
19.969
3/16 MIN.
4.031
3.969
1.031
.969
28.031
27.969
30.062
29.938
C
5 IN x 9# CHANNEL
.781
.719
C
SHT 3 ZONE B-3
3/4 DIA THRU
1 3/8 DIA BACK SPOTFACE
10 HOLES
5 IN x 10# I BEAM
3 PLACES
ENCLOSED THRU LIFT TRUCK FORK OPENING.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 11009 DATE 24 April 63

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.

SEE SHEET 2	FOR SECTION	AA
3		BB
3	PARTIAL SEC.	CC
4	SECTION	DD
4		EE
4		FF
4		GG
5		HH
5		JJ
5		KK
5		LL
3	PARTIAL SEC.	MM
SEE SHEET 2	FOR VIEW	PP

Ⓒ REPLACES REV B WITH CHANGE

1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64	+.02	+2°
− 1/64	−.02	−2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Weigins 26 MAR 63 DATE
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL L. Gilman 9/23/63
NASA APPROVAL W. Michael 9/24/63
MIT APPROVAL L. Hafel 9/26/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY, BASIC
(APOLLO OPTICS INERTIAL ANALYZER)
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE E | 1900007
SCALE 1/8 | SHEET 1 OF 5

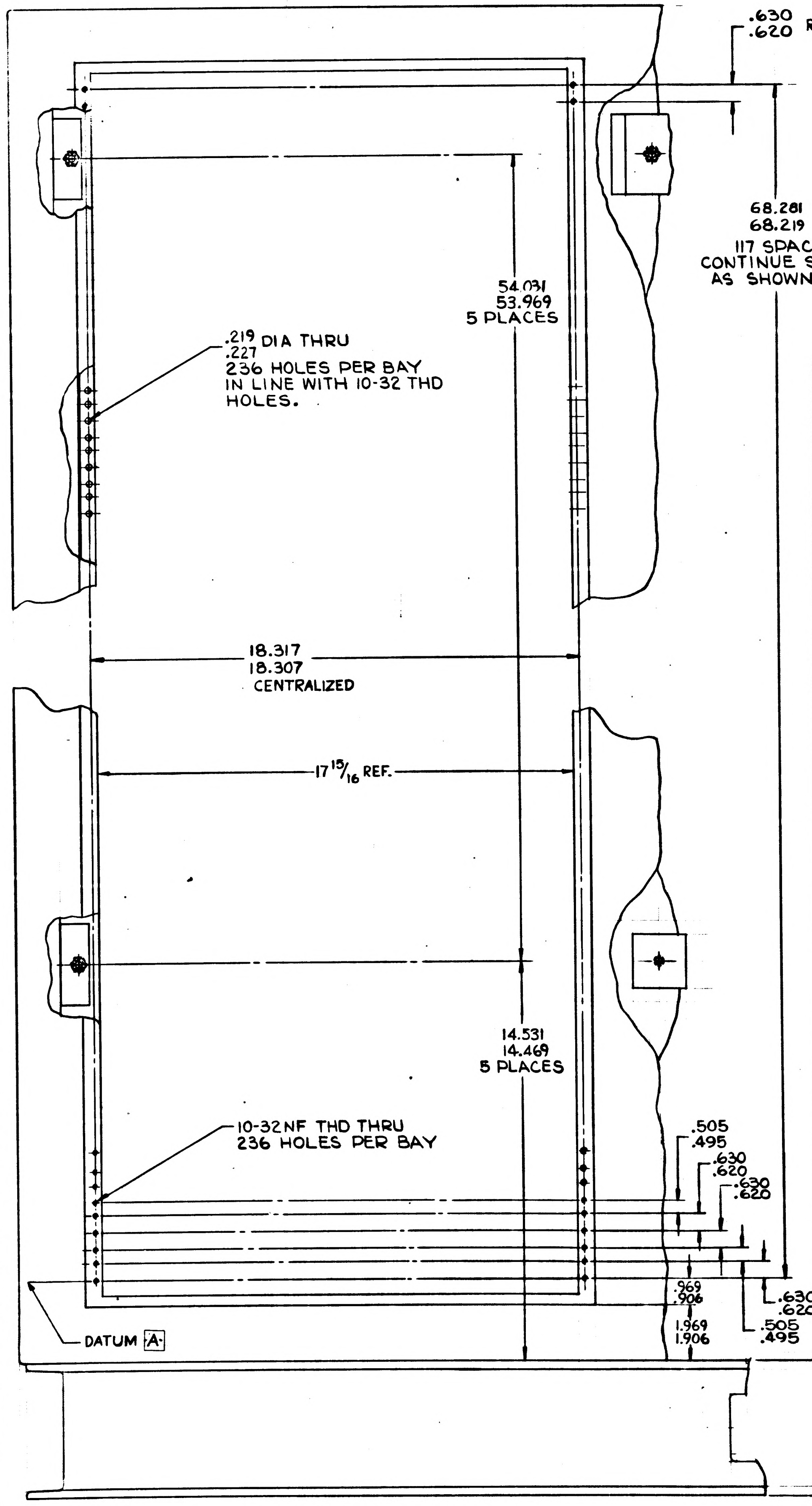
1900007 C

MASTER

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 0340		6 SEPT. 63	

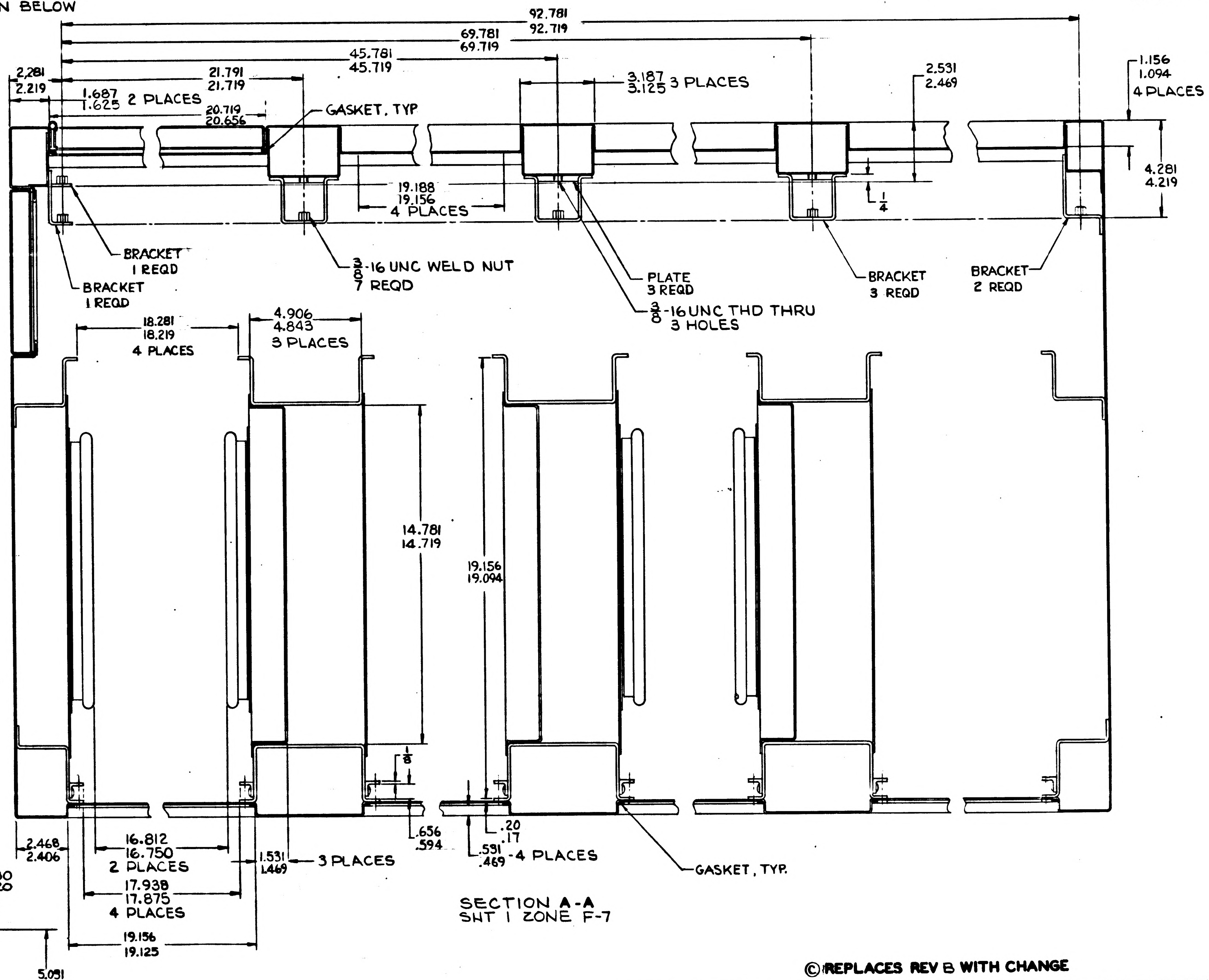
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00199 **DATE** 27 Jul 63



.630
.620 REF.
68.281
68.219
117 SPACES
CONTINUE SEQUENCE
AS SHOWN BELOW
54.031
53.969
5 PLACES
.219
.227 DIA THRU
236 HOLES PER BAY
IN LINE WITH 10-32 THD
HOLES.
18.317
18.307
CENTRALIZED
17 15/16 REF.
14.531
14.469
5 PLACES
10-32NF THD THRU
236 HOLES PER BAY
.505
.495
.630
.620
.630
.620
.969
.906
1.969
1.906
.630
.620
.505
.495
DATUM A
5.091
4.969

PARTIAL VIEW P-P
SHT 1 ZONE G-7



92.781
92.719
69.781
69.719
45.781
45.719
21.791
21.719
2.281
2.219
1.687
1.625 2 PLACES
20.719
20.656
GASKET, TYP
3.187
3.125 3 PLACES
2.531
2.469
1.156
1.094
4 PLACES
4.281
4.219
19.188
19.156
4 PLACES
1/4
BRACKET
1 REQD
BRACKET
1 REQD
3/8-16 UNC WELD NUT
7 REQD
PLATE
3 REQD
3/8-16 UNC THD THRU
3 HOLES
BRACKET
3 REQD
BRACKET
2 REQD
18.281
18.219
4 PLACES
4.906
4.843
3 PLACES
14.781
14.719
19.156
19.094
1/8
2.468
2.406
16.812
16.750
2 PLACES
17.938
17.875
4 PLACES
19.156
19.125
1.531
1.469
3 PLACES
.656
.594
.20
.17
.531
.469
4 PLACES
GASKET, TYP.

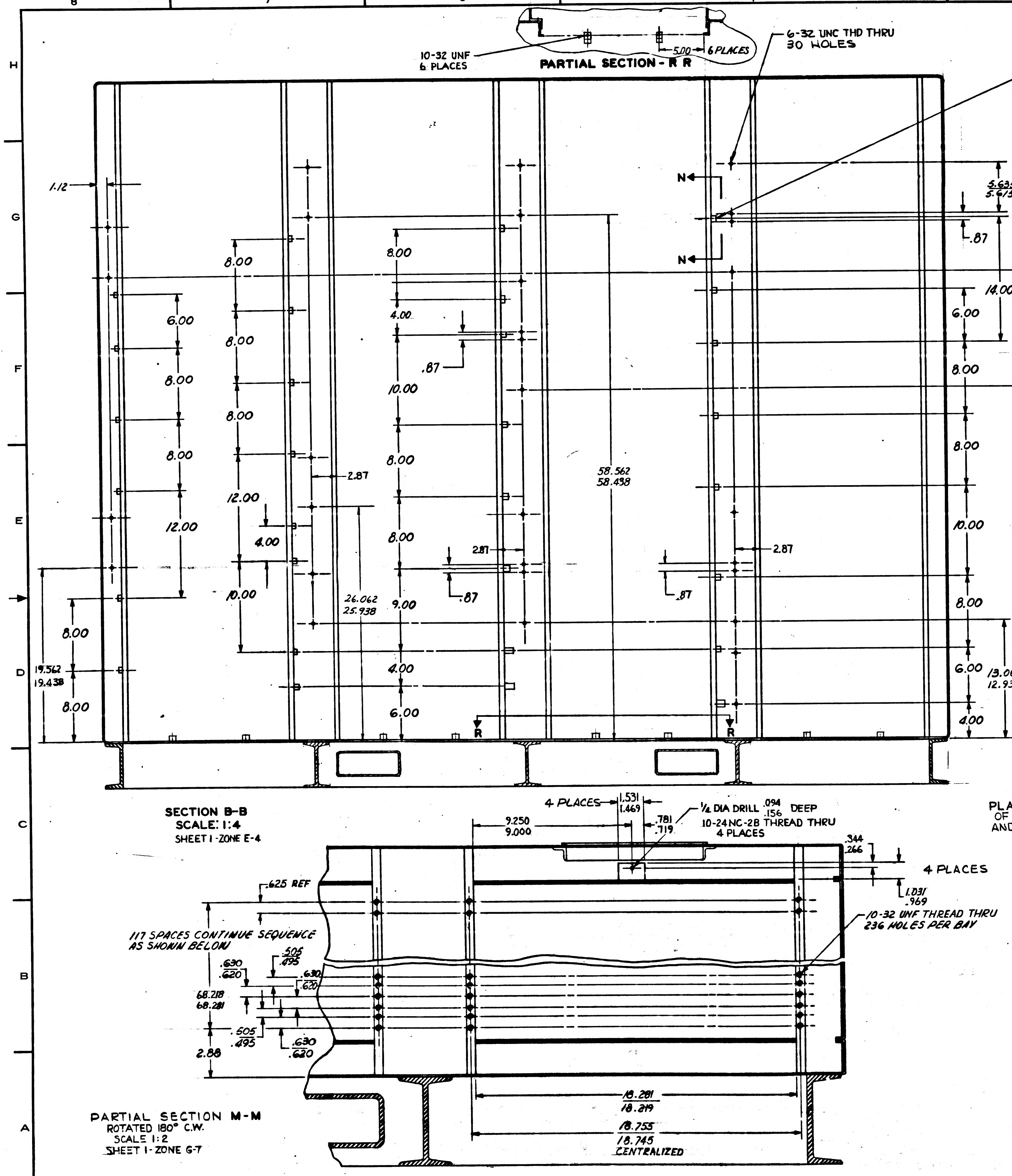
SECTION A-A
SHT 1 ZONE F-7

Ⓒ REPLACES REV B WITH CHANGE

1900031-011	1900004-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − − − DECIMALS +.02 −.02 ANGLES +2° −2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL 9/24/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER)
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL 9/24/63	CODE IDENT NO. SIZE E 1900007
APPLICATION		CONTRACT NAS9-497	MIT APPROVAL 9/24/63	SCALE 1/2 SHEET 2 OF 5

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	189983	5 SEP 63	

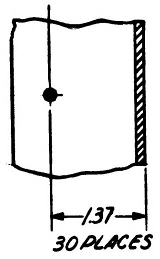

10-32 UNF
6 PLACES
5.00
6 PLACES
6-32 UNC THD THRU
30 HOLES
N
N
1.12
8.00
6.00
8.00
8.00
8.00
8.00
8.00
12.00
12.00
4.00
10.00
8.00
4.00
10.00
8.00
8.00
9.00
4.00
6.00
.87
2.87
2.87
2.87
.87
.87
26.062
25.938
58.562
58.438
5.635
5.615
15 PLACES
.87
14.00
6.00
8.00
8.00
10.00
8.00
6.00
4.00
13.062
12.938
39.062
38.938
52.062
51.938
19.562
19.438
8.00
8.00
R
R
4 PLACES
1.531
1.469
9.250
9.000
.781
.719
1/4 DIA DRILL .094 .156 DEEP
10-24 NC-2B THREAD THRU
4 PLACES
.344
.266
4 PLACES
1.031
.969
.625 REF
117 SPACES CONTINUE SEQUENCE AS SHOWN BELOW
10-32 UNF THREAD THRU
236 HOLES PER BAY
.630
.620
.505
.495
.630
.620
68.218
68.281
.505
.495
.630
.620
2.88
18.281
18.219
18.755
18.745
CENTRALIZED

PARTIAL SECTION - R R

SECTION B-B
SCALE: 1:4
SHEET 1 - ZONE E-4

PARTIAL SECTION M-M
ROTATED 180° C.W.
SCALE 1:2
SHEET 1 - ZONE G-7

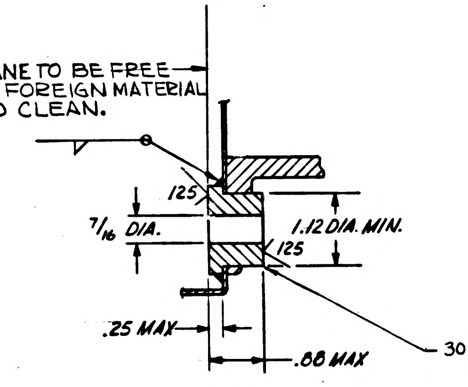
CLAMP SHOWN FOR REFERENCE ONLY.


.137
30 PLACES

PARTIAL SECTION N-N
SCALE: FULL

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 0C111 DATE 24 Apr 63

PLANE TO BE FREE OF FOREIGN MATERIAL AND CLEAN.


.125
7/16 DIA.
1.12 DIA. MIN.
.125
.25 MAX
.88 MAX
302 OR 303 SST

PARTIAL SECTION C-C
SCALE: FULL
SHEET 1 ZONE B-3

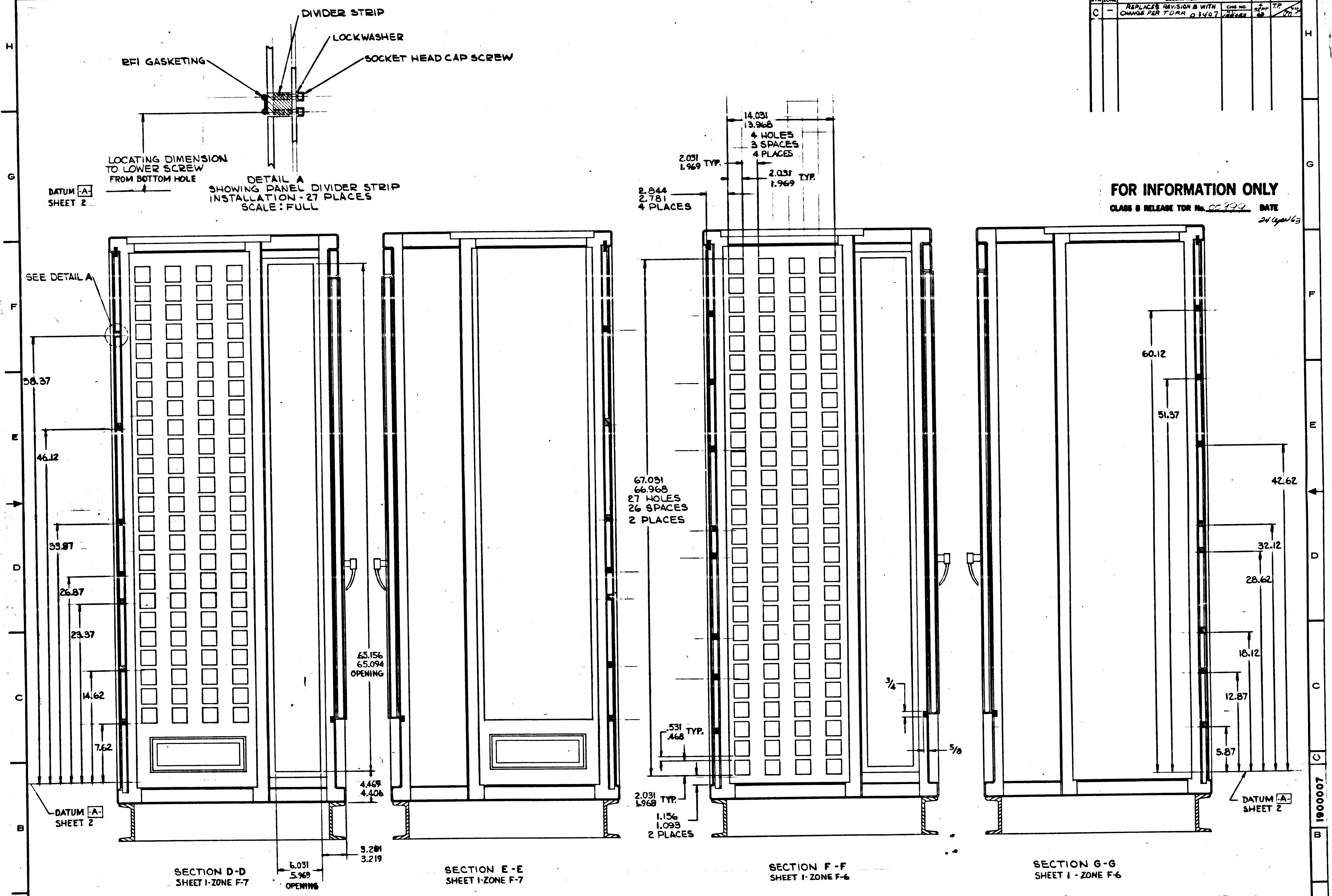
Ⓒ REPLACES REV B WITH CHANGE

1900031-011 NEXT ASSY	1900004-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ±.02 ANGLES ±2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN DATE 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL 7/23/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER)
APPLICATION		MATERIAL CONTRACT NAS9-497	NASA APPROVAL 9/10/63 MIT APPROVAL 9/26/63	CODE IDENT NO. SIZE E 1900007 SCALE NOTED SHEET 3 OF 5

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MSC	4 SEPT 63	T.P.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 03799 DATE 24 Sept 63


DIVIDER STRIP
LOCKWASHER
RFI GASKETING
SOCKET HEAD CAP SCREW
LOCATING DIMENSION TO LOWER SCREW FROM BOTTOM HOLE
DATUM -A- SHEET 2
DETAIL A
SHOWING PANEL DIVIDER STRIP INSTALLATION - 27 PLACES
SCALE: FULL
SEE DETAIL A
58.37
46.12
33.87
26.87
23.37
14.62
7.62
DATUM -A- SHEET 2
65.156
65.094
OPENING
4.469
4.406
3.281
3.219
6.031
5.969
OPENING
SECTION D-D
SHEET 1-ZONE F-7
SECTION E-E
SHEET 1-ZONE F-7
14.031
13.968
4 HOLES
3 SPACES
4 PLACES
2.031
1.969 TYP.
2.031
1.969 TYP.
2.844
2.781
4 PLACES
67.031
66.968
27 HOLES
26 SPACES
2 PLACES
.531
.468 TYP.
2.031
1.968 TYP.
1.156
1.093
2 PLACES
3/4
5/8
SECTION F-F
SHEET 1-ZONE F-6
60.12
51.37
42.62
32.12
28.62
18.12
12.87
5.87
DATUM -A- SHEET 2
SECTION G-G
SHEET 1 - ZONE F-6

Ⓒ REPLACES REV B WITH CHANGE

1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ —
— —	-.02	— —

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 26 MAR 63
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL 9/23/63
NASA APPROVAL 9/24/63
MIT APPROVAL 9/24/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY BASIC
(APOLLO OPTICS-INERTIAL ANALYZER)

CODE IDENT NO.
SIZE E
1900007
SCALE 1/4
SHEET 2 OF 5

1900007 C

MASTER

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. REQUIREMENTS: ELECTRO-INTERFERENCE ENVIROMENT CONTROL REQUIREMENT. THE SHIELDING MATERIALS AND CONSTRUCTION SHALL PROVIDE MEANS FOR ATTENUATION OF ELECTROMAGNETIC EMANATIONS FOR MAGNETIC FIELDS ABOVE 150KC AND BELOW 1000 MC.
3. MATERIAL: QQ-S-698 STEEL, SHEET AND STRIP, LOW CARBON TYPE COLD ROLLED, COMMERCIAL QUALITY. 16 GAGE OR LARGER THROUGH OUT. QQ-S-741 STRUCTURAL SECTION.
4. FINISH: PREPARE ALL SURFACES, EXCEPT TAPPED HOLES AND TINNED SURFACES. WITH MIL-P-26915, PRIMER COATING AND FINISH WITH 2 COATS TT-E-529 CLASS B ENAMEL. COLOR 26251 OF FED-STD-595 PER MIL-STD-808-F101.
5. MUST BE FREE FROM BURRS AND SHARP EDGES.
6. APPLY 37-40 IN-LBS OF TORQUE TO ALL 10-32 SCREWS.
7. ALL THREADS SHALL BE OF CLASS 2.
8. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-267).

ORIGINAL SOURCE OF SUPPLY:
SUPER STEEL PRODUCTS CO.
1244 N. FOURTH STREET
MILWAUKEE 12, WISCONSIN
PART NO. 1495-A.

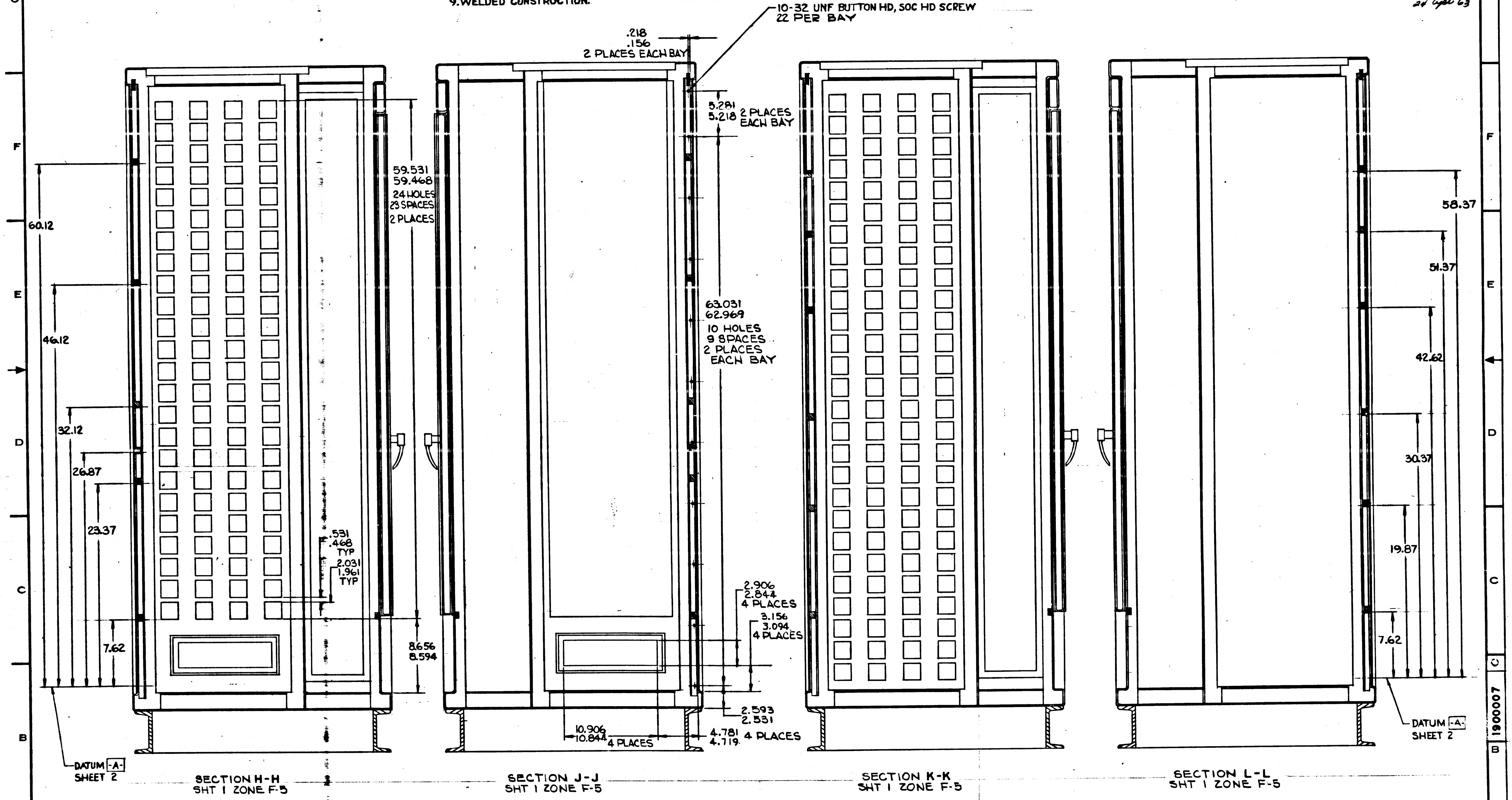
9. WELDED CONSTRUCTION.

10. 7/32 DIA MAX HOLE IN GASKET TO CLEAR 10-32 SCREWS.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REV. B ON B WITH CHANGE PER TDRR 03407	MIT 189483	2 SEPT. 63	TP

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00711 DATE 24 Apr 63


10-32 UNF BUTTON HD, SOC HD SCREW
22 PER BAY
.218
.156
2 PLACES EACH BAY
5.281
5.218
2 PLACES EACH BAY
59.531
59.468
24 HOLES
23 SPACES
2 PLACES
60.12
46.12
32.12
26.87
23.37
7.62
.531
.468
TYP
2.031
1.961
TYP
8.656
8.594
63.031
62.969
10 HOLES
9 SPACES
2 PLACES
EACH BAY
2.906
2.844
4 PLACES
3.156
3.094
4 PLACES
2.593
2.531
10.906
10.844
4 PLACES
4.781
4.719
4 PLACES
58.37
51.37
42.62
30.37
19.87
7.62
DATUM -A-
SHEET 2
DATUM -A-
SHEET 2
SECTION H-H
SHT 1 ZONE F-5
SECTION J-J
SHT 1 ZONE F-5
SECTION K-K
SHT 1 ZONE F-5
SECTION L-L
SHT 1 ZONE F-5

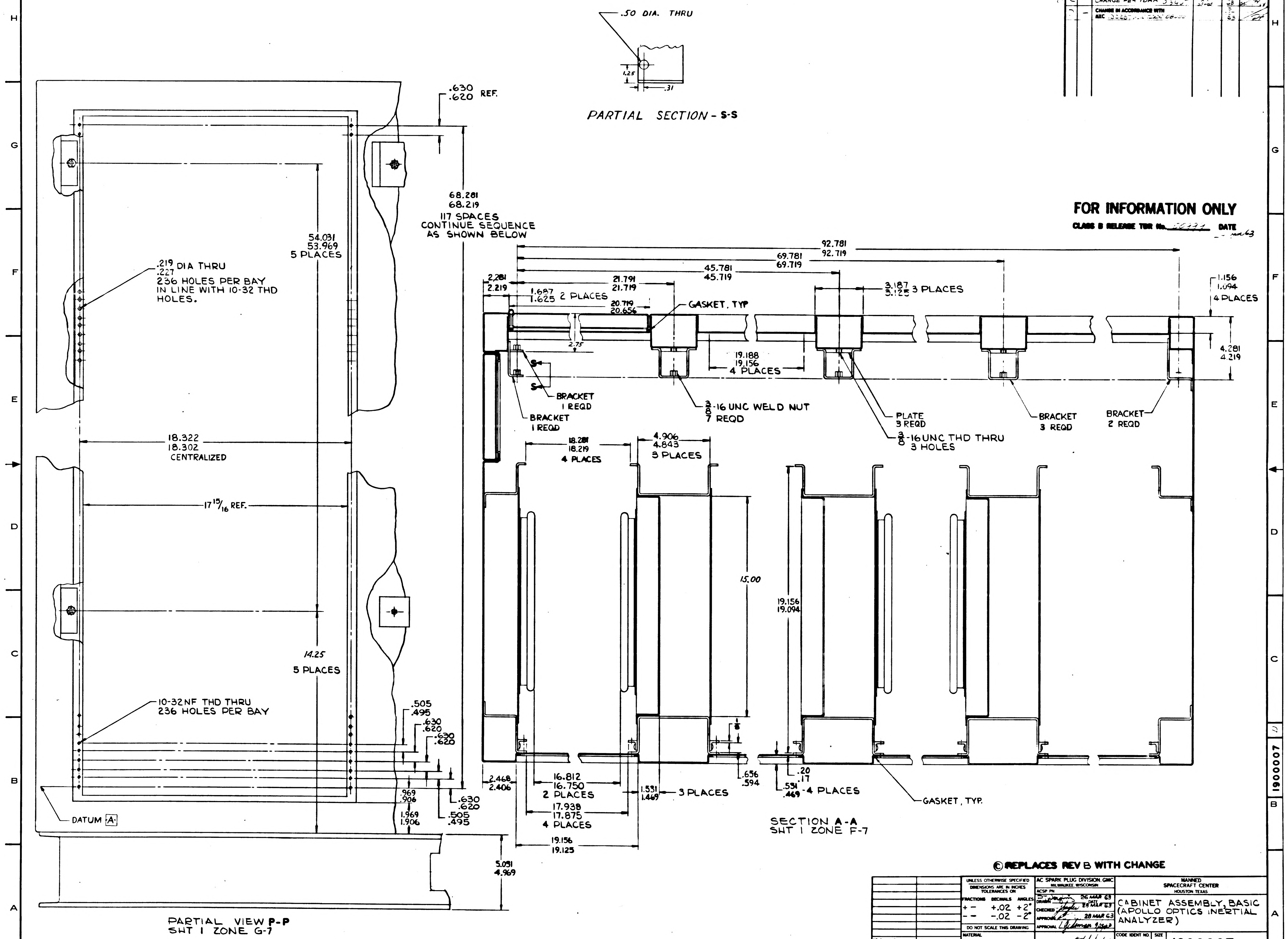
Ⓒ REPLACES REV B WITH CHANGE

1900031-011	1900004-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — — — DECIMALS +.02 -.02 ANGLES + — — — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN 26 MAR 63 CHECKED 26 MAR 63 APPROVAL 28 MAR 63 APPROVAL 9/19/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY BASIC (APOLLO OPTICS-INERTIAL ANALYZER)
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL	CODE IDENT NO. SIZE E 1900007
APPLICATION		CONTRACT NAS9-497	MIT APPROVAL 9/26/63	SCALE 1/4 SHEET 5 OF 5

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	–	REPLACES REVISION B W... CHANGE PER TDRR 0340...		SEPT 63	
	–	CHANGE IN ACCORDANCE WITH MXC 00287...		63	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 22431 DATE ... 63



.50 DIA. THRU
1.25
.31
.630
.620 REF.
68.281
68.219
117 SPACES
CONTINUE SEQUENCE
AS SHOWN BELOW
54.031
53.969
5 PLACES
.219 DIA THRU
.227
236 HOLES PER BAY
IN LINE WITH 10-32 THD
HOLES.
18.322
18.302
CENTRALIZED
17 15/16 REF.
14.25
5 PLACES
10-32NF THD THRU
236 HOLES PER BAY
.505
.495
.630
.620
.630
.620
.969
.906
1.969
1.906
.630
.620
.505
.495
DATUM A
5.051
4.969
92.781
92.719
69.781
69.719
45.781
45.719
2.281
2.219
21.791
21.719
1.687
1.625 2 PLACES
20.719
20.656
3.187
3.125 3 PLACES
1.156
1.094
4 PLACES
GASKET, TYP
2.75
19.188
19.156
4 PLACES
4.281
4.219
S
S
BRACKET
1 REQD
BRACKET
1 REQD
3/8-16 UNC WELD NUT
7 REQD
PLATE
3 REQD
3/8-16 UNC THD THRU
3 HOLES
BRACKET
3 REQD
BRACKET
2 REQD
18.281
18.219
4 PLACES
4.906
4.843
3 PLACES
15.00
.20
.17
19.156
19.094
2.468
2.406
16.812
16.750
2 PLACES
17.938
17.875
4 PLACES
19.156
19.125
1.531
1.469
3 PLACES
.656
.594
.531
.469
4 PLACES
GASKET, TYP.

PARTIAL SECTION - S-S

PARTIAL VIEW P-P
SHT 1 ZONE G-7

SECTION A-A
SHT 1 ZONE F-7

© REPLACES REV B WITH CHANGE

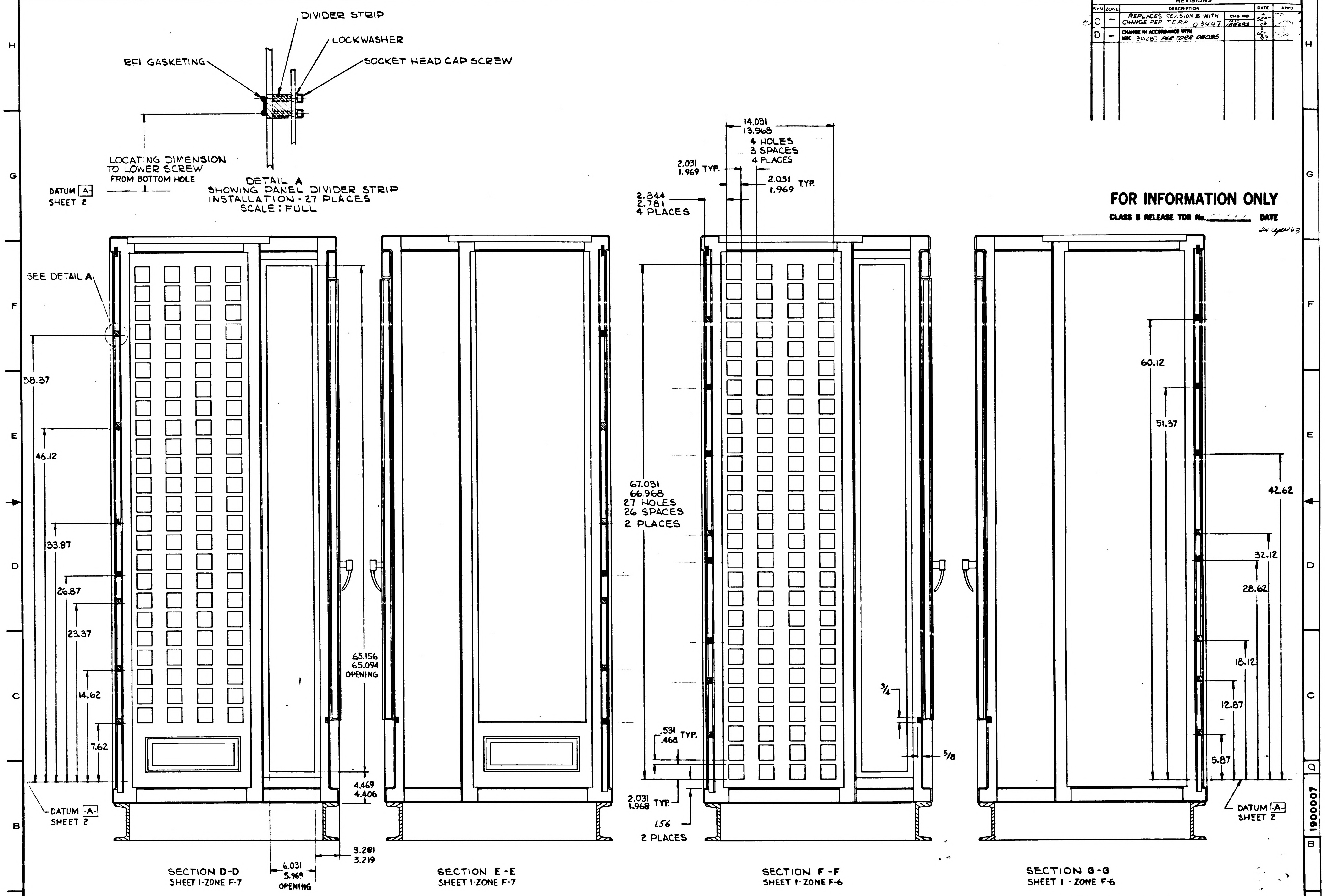
1900031-011 NEXT ASSY	1900004-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + – – – DECIMALS +.02 –.02 ANGLES +2° –2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER)
APPLICATION		MATERIAL	NASA APPROVAL	CODE IDENT NO. SIZE E 1900007
		CONTRACT NAS9-497	MIT APPROVAL	SCALE 1/2 SHEET 2 OF 5

1900007

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C	—	REPLACES REVISION B WITH CHANGE PER TCRR 03407	MC 189489	4 SEPT 63	
D	—	CHANGE IN ACCORDANCE WITH MC 30287 PER TCRR 08095		15 OCT 63	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. _____ DATE 24 Sept 63


DIVIDER STRIP
LOCKWASHER
RFI GASKETING
SOCKET HEAD CAP SCREW
LOCATING DIMENSION TO LOWER SCREW FROM BOTTOM HOLE
DATUM -A- SHEET 2
DETAIL A
SHOWING PANEL DIVIDER STRIP INSTALLATION - 27 PLACES
SCALE: FULL
SEE DETAIL A
58.37
46.12
33.87
26.87
23.37
14.62
7.62
65.156
65.094
OPENING
4.469
4.406
3.281
3.219
6.031
5.969
OPENING
14.031
13.968
4 HOLES
3 SPACES
4 PLACES
2.031
1.969 TYP.
2.031
1.969 TYP.
2.844
2.781
4 PLACES
67.031
66.968
27 HOLES
26 SPACES
2 PLACES
.531
.468 TYP.
2.031
1.968 TYP.
1.56
2 PLACES
3/4
5/8
60.12
51.37
42.62
32.12
28.62
18.12
12.87
5.87
SECTION D-D
SHEET 1-ZONE F-7
SECTION E-E
SHEET 1-ZONE F-7
SECTION F-F
SHEET 1-ZONE F-6
SECTION G-G
SHEET 1 - ZONE F-6
8
7
6
5
4
3
2
1
H
G
F
E
D
C
B
A

Ⓒ REPLACES REV B WITH CHANGE

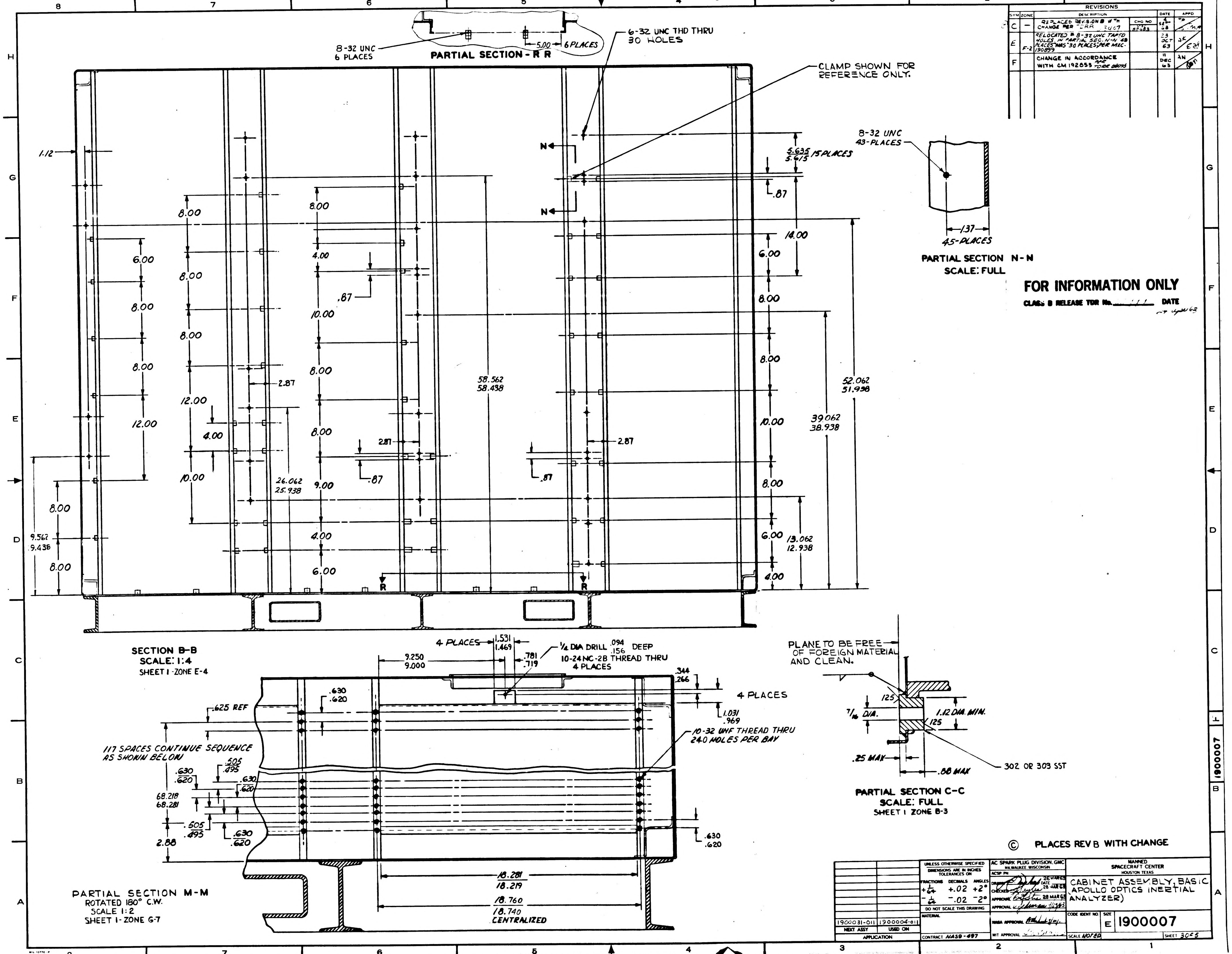
1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — − — DECIMALS +.02 −.02 ANGLES + — − — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
MATERIAL	DRAWN P. Wenzing 26 MAR 63 DATE CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL Johnson 9/23/63 NASA APPROVAL 9/24/63 MIT APPROVAL 9/24/63	CABINET ASSEMBLY BASIC (APOLLO OPTICS-INERTIAL ANALYZER)
CONTRACT NAS9-497		CODE IDENT NO. SIZE E 1900007 SCALE 1/4 SHEET 4 OF 5

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 2407	63483	4 SEP 63	
E	F-2	RELOCATED 8-32 UNC TAPED HOLES. IN PARTIAL SEC. N-N 43 PLACES WAS 30 PLACES; PER MEC-190899		23 OCT 63	AK
F		CHANGE IN ACCORDANCE WITH CM 192853 PER TDRR 08095		11 DEC 63	AN

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ___ DATE


PARTIAL SECTION - R R
8-32 UNC
6 PLACES
5.00
6 PLACES
6-32 UNC THD THRU
30 HOLES
CLAMP SHOWN FOR REFERENCE ONLY.
N
N
R
R
1.12
5.635
5.615
15 PLACES
.87
14.00
6.00
8.00
8.00
10.00
8.00
6.00
4.00
13.062
12.938
52.062
51.938
39.062
38.938
58.562
58.438
26.062
25.938
2.87
2.87
2.87
.87
.87
.87
12.00
12.00
10.00
4.00
4.00
9.00
9.562
9.438
SECTION B-B
SCALE: 1:4
SHEET 1 - ZONE E-4
8-32 UNC
43-PLACES
.137
45-PLACES
PARTIAL SECTION N-N
SCALE: FULL
4 PLACES
1.531
1.469
1/4 DIA DRILL .094 .156 DEEP
10-24NC-2B THREAD THRU
4 PLACES
9.250
9.000
.781
.719
.344
.266
.630
.620
.625 REF
1.031
.969
117 SPACES CONTINUE SEQUENCE AS SHOWN BELOW
.505
.495
10-32 UNF THREAD THRU
240 HOLES PER BAY
68.218
68.281
2.88
18.281
18.219
18.760
18.740
CENTRALIZED
PARTIAL SECTION M-M
ROTATED 180° C.W.
SCALE 1:2
SHEET 1 - ZONE G-7
PLANE TO BE FREE OF FOREIGN MATERIAL AND CLEAN.
125
7/16 DIA.
1.12 DIA. MIN.
125
.25 MAX
.88 MAX
302 OR 303 SST
PARTIAL SECTION C-C
SCALE: FULL
SHEET 1 ZONE B-3

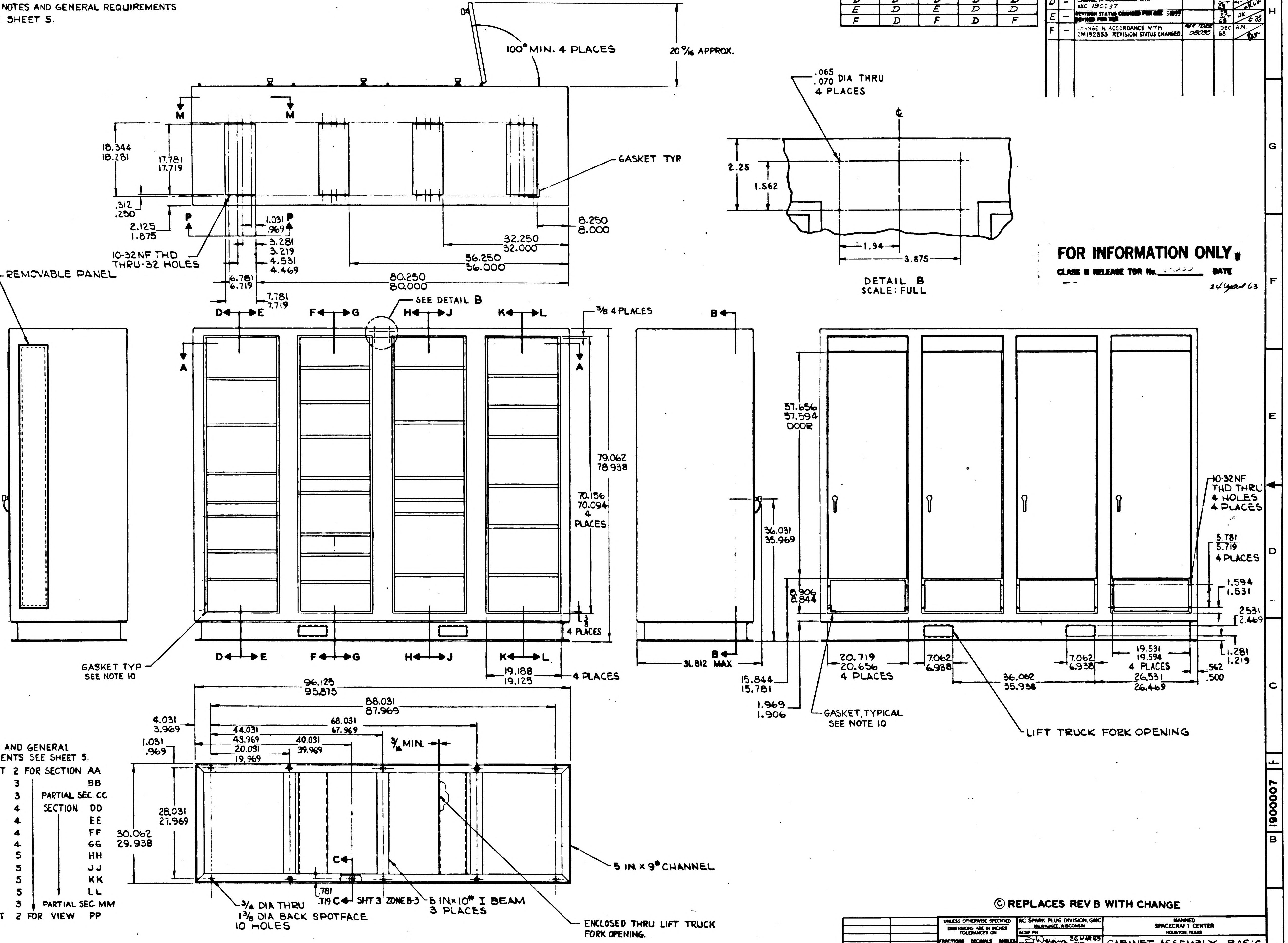
Ⓒ PLACES REV B WITH CHANGE

1900031-011	1900004-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ± .02 ANGLES ± 2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN DATE 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL 7/23/63	MANNED SPACECRAFT CENTER HOUSTON TEXAS CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER)
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL	CODE IDENT NO. SIZE E 1900007
APPLICATION		CONTRACT NAS9-497	MIT APPROVAL	SCALE NOTED SHEET 3 OF 5

REVISION STATUS OF SHEETS				
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5
C	C	C	C	C
D	D	D	D	D
E	D	E	D	D
F	D	F	D	F

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACED REVISION B WITH CHANGE PER TDR 33407	[illegible]	4 SEPT 63	T.P.
D	—	CHANGE IN ACCORDANCE WITH MXC 190037		5 OCT 63	JSH
E	—	REVISION STATUS CHANGED PER [illegible] 36099 REVISED PER TDR		25 OCT 63	AK
F	—	CHANGE IN ACCORDANCE WITH CM192853. REVISION STATUS CHANGED.	28095	1 DEC 63	A.N.

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.



100° MIN. 4 PLACES
20 9/16 APPROX.
M
M
18.344
18.281
17.781
17.719
.312
.250
GASKET TYP
2.125
1.875
P
1.031
.969
P
8.250
8.000
3.281
3.219
4.531
4.469
32.250
32.000
10-32NF THD THRU-32 HOLES
56.250
56.000
6.781
6.719
80.250
80.000
7.781
7.719
REMOVABLE PANEL
SEE DETAIL B
3/8 4 PLACES
D
E
F
G
H
J
K
L
A
A
B
B
79.062
78.938
70.156
70.094
4 PLACES
1/8
4 PLACES
GASKET TYP
SEE NOTE 10
19.188
19.125
4 PLACES
31.812 MAX
.065
.070 DIA THRU
4 PLACES
℄
2.25
1.562
1.94
3.875
DETAIL B
SCALE: FULL
57.656
57.594
DOOR
36.031
35.969
8.906
8.844
15.844
15.781
1.969
1.906
20.719
20.656
4 PLACES
7.062
6.938
7.062
6.938
36.062
35.938
19.531
19.594
4 PLACES
26.531
26.469
.562
.500
10-32NF THD THRU 4 HOLES 4 PLACES
5.781
5.719
4 PLACES
1.594
1.531
2.531
2.469
1.281
1.219
GASKET, TYPICAL
SEE NOTE 10
LIFT TRUCK FORK OPENING
96.125
95.815
88.031
87.969
4.031
3.969
68.031
67.969
44.031
43.969
40.031
39.969
20.031
19.969
1.031
.969
3/16 MIN.
28.031
27.969
30.062
29.938
C
C
.781
.719
SHT 3 ZONE B-3
5 IN.x 9# CHANNEL
3/4 DIA THRU
1 3/8 DIA BACK SPOTFACE
10 HOLES
5 IN.x 10# I BEAM
3 PLACES
ENCLOSED THRU LIFT TRUCK FORK OPENING.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ____ DATE 24 Oct 63

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.

SEE SHEET	2	FOR SECTION	AA
	3		BB
	3	PARTIAL SEC	CC
	4	SECTION	DD
	4		EE
	4		FF
	4		GG
	5		HH
	5		JJ
	5		KK
	5		LL
	3	PARTIAL SEC.	MM
SEE SHEET	2	FOR VIEW	PP

Ⓒ REPLACES REV B WITH CHANGE

1900031-011 NEXT ASSY	1900004-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ± .02 ANGLES ± 2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN
APPLICATION		MATERIAL	ACSP PN
		CONTRACT NAS 9-497	DRAWN Wiegins 26 MAR 63 DATE CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL Ullman 9/23/63 NASA APPROVAL 9/24/63 MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	
	E	1900007
SCALE 1/8		SHEET 1 OF 5

NOTES:

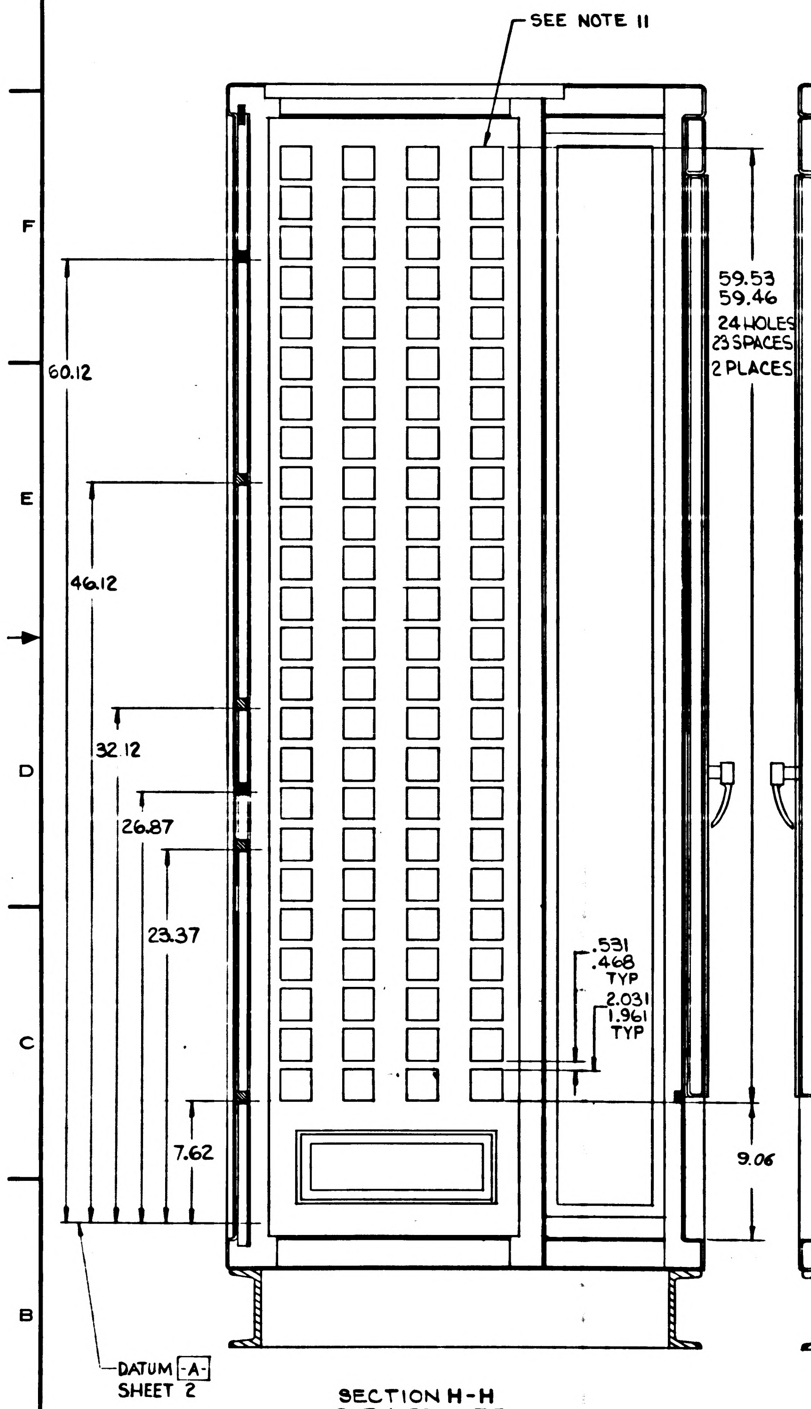
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. REQUIREMENTS:
   ELECTRO-INTERFERENCE ENVIROMENT CONTROL REQUIREMENT. THE SHIELDING MATERIALS AND CONSTRUCTION SHALL PROVIDE MEANS FOR ATTENUATION OF ELECTROMAGNETIC EMANATIONS FOR MAGNETIC FIELDS ABOVE 150KC AND BELOW 1000MC.
3. MATERIAL:
   QQ-S-698 STEEL, SHEET AND STRIP, LOW CARBON TYPE COLD ROLLED, COMMERCIAL QUALITY. 16 GAGE OR LARGER THROUGH OUT.
   QQ-S-741 STRUCTURAL SECTION.
4. FINISH:
   PREPARE ALL SURFACES, EXCEPT TAPPED HOLES AND TINNED SURFACES. WITH MIL-P-26915, PRIMER COATING AND FINISH WITH 2 COATS TT-E-529 CLASS B ENAMEL, COLOR 26251 OF FED-STD-595 PER MIL-STD-808-F101.
5. MUST BE FREE FROM BURRS AND SHARP EDGES.
6. APPLY 37-40 IN-LBS OF TORQUE TO ALL 10-32 SCREWS.
7. ALL THREADS SHALL BE OF CLASS 2.
8. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-267).
   ORIGINAL SOURCE OF SUPPLY:
   SUPER STEEL PRODUCTS CO.
   1244 N. FOURTH STREET
   MILWAUKEE 12, WISCONSIN
   PART NO. 1495-A.
9. WELDED CONSTRUCTION.
10. 7/32 DIA MAX HOLE IN GASKET TO CLEAR 10-32 SCREWS.
11. CLOSURE PANELS TO COVER $\frac{2}{3}$ OF THE AIR OPENINGS. TO BE SUPPLIED WITH EACH CABINET.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03467	03463	4 SEPT 63	
F		CHANGE IN ACCORDANCE WITH CM 92553 PER TDRR 08095		DEC 63	A.N.

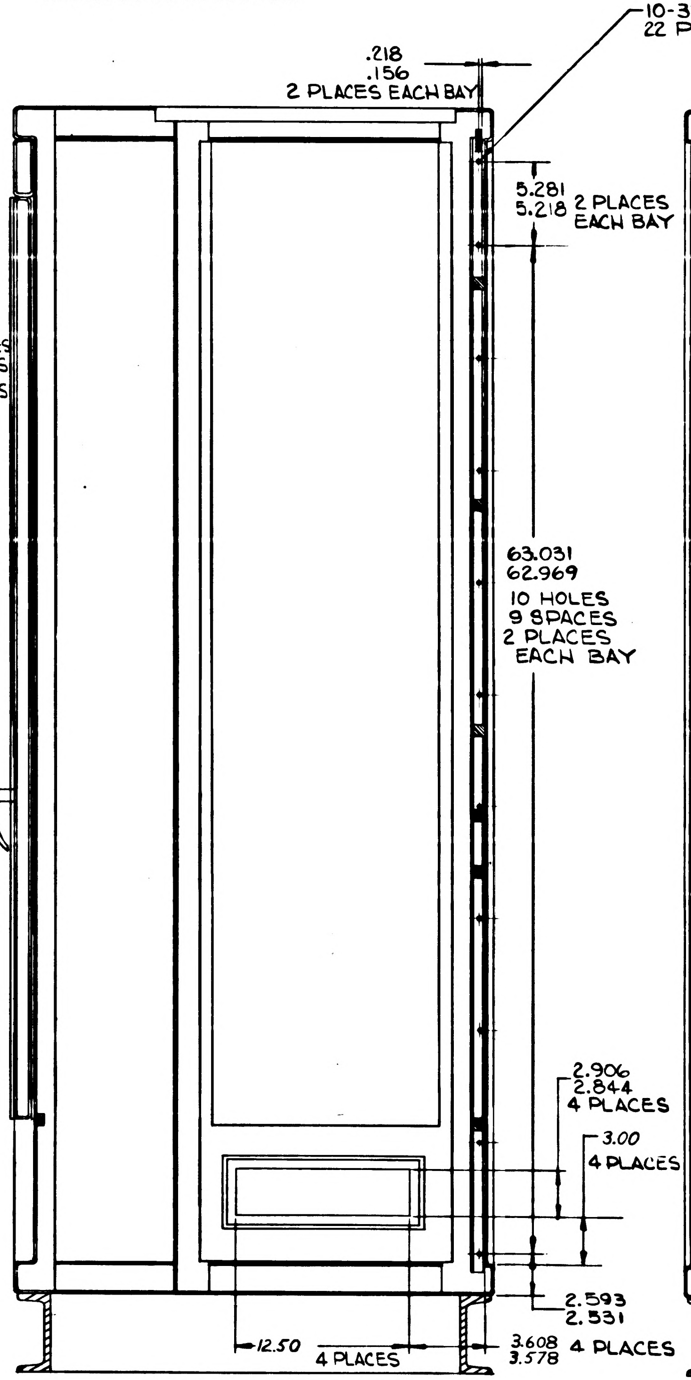
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. OC 111 **DATE** 24 Apr 63



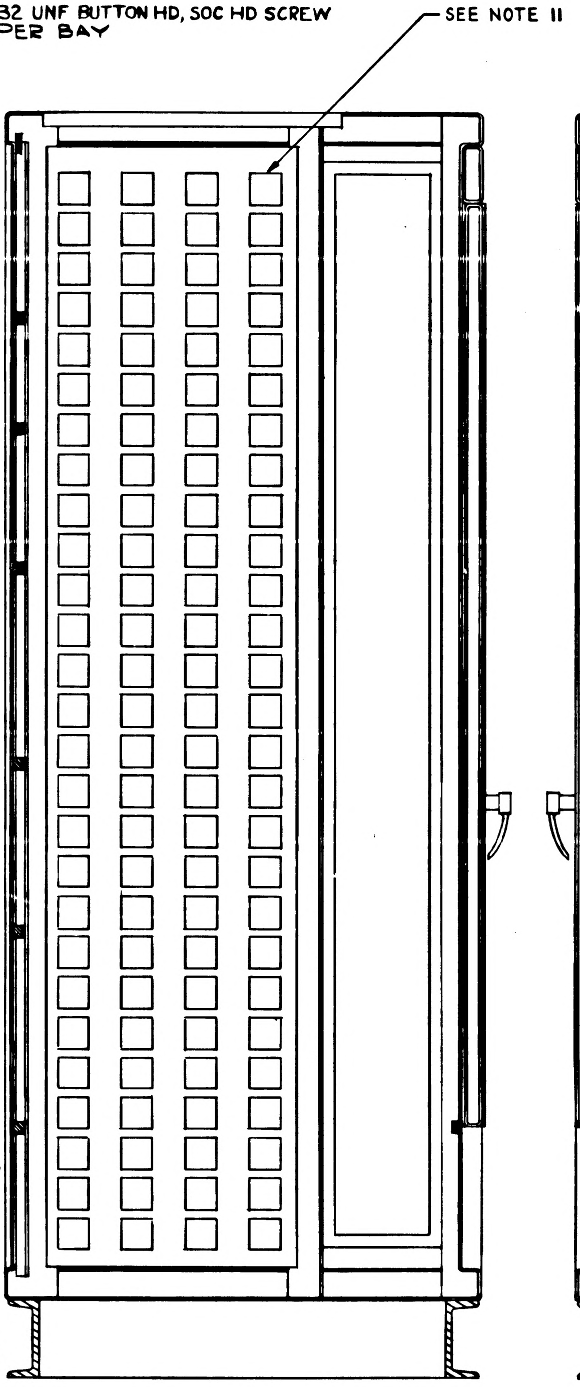
SEE NOTE 11
60.12
46.12
32.12
26.87
23.37
7.62
59.53
59.46
24 HOLES
23 SPACES
2 PLACES
.531
.468
TYP
2.031
1.961
TYP
9.06
DATUM -A-
SHEET 2

SECTION H-H
SHT 1 ZONE F-5

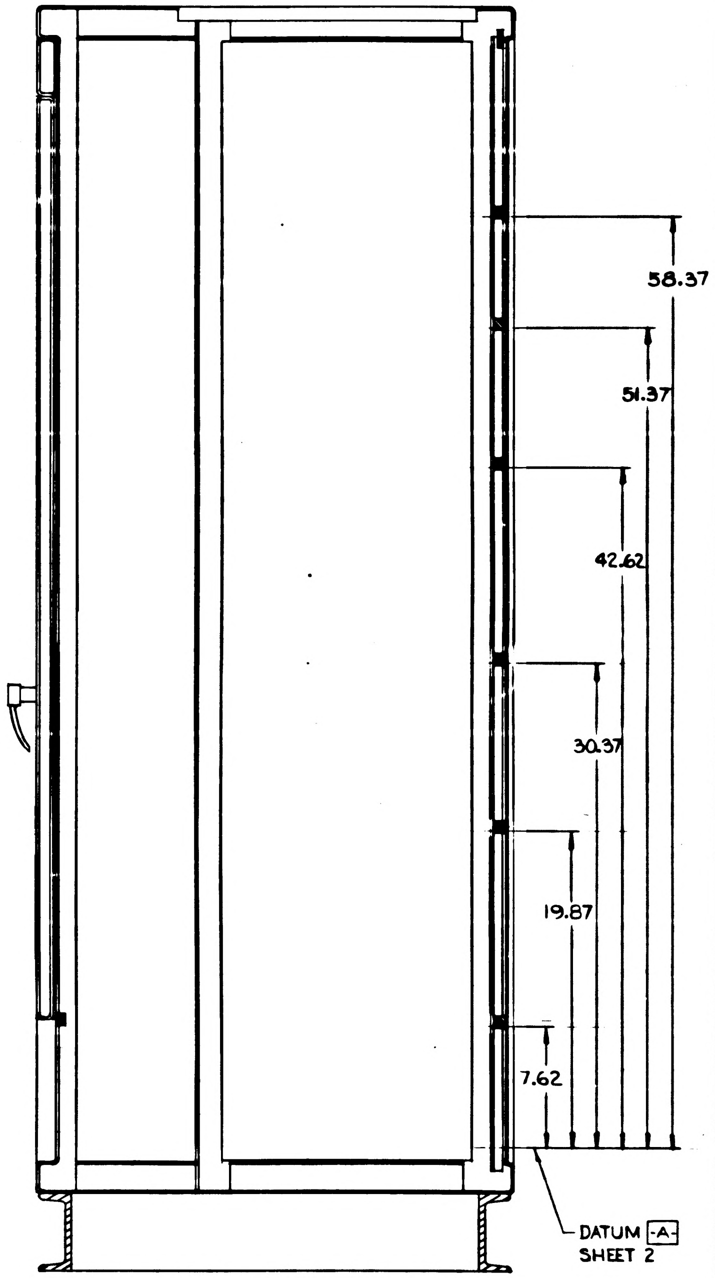


.218
.156
2 PLACES EACH BAY
10-32 UNF BUTTON HD, SOC HD SCREW
22 PER BAY
5.281
5.218
2 PLACES
EACH BAY
63.031
62.969
10 HOLES
9 SPACES
2 PLACES
EACH BAY
2.906
2.844
4 PLACES
3.00
4 PLACES
2.593
2.531
12.50
4 PLACES
3.608
3.578
4 PLACES

SECTION J-J
SHT 1 ZONE F-5



SECTION K-K
SHT 1 ZONE F-5



58.37
51.37
42.62
30.37
19.87
7.62
DATUM -A-
SHEET 2

SECTION L-L
SHT 1 ZONE F-5

Ⓒ REPLACES REV B WITH CHANGE

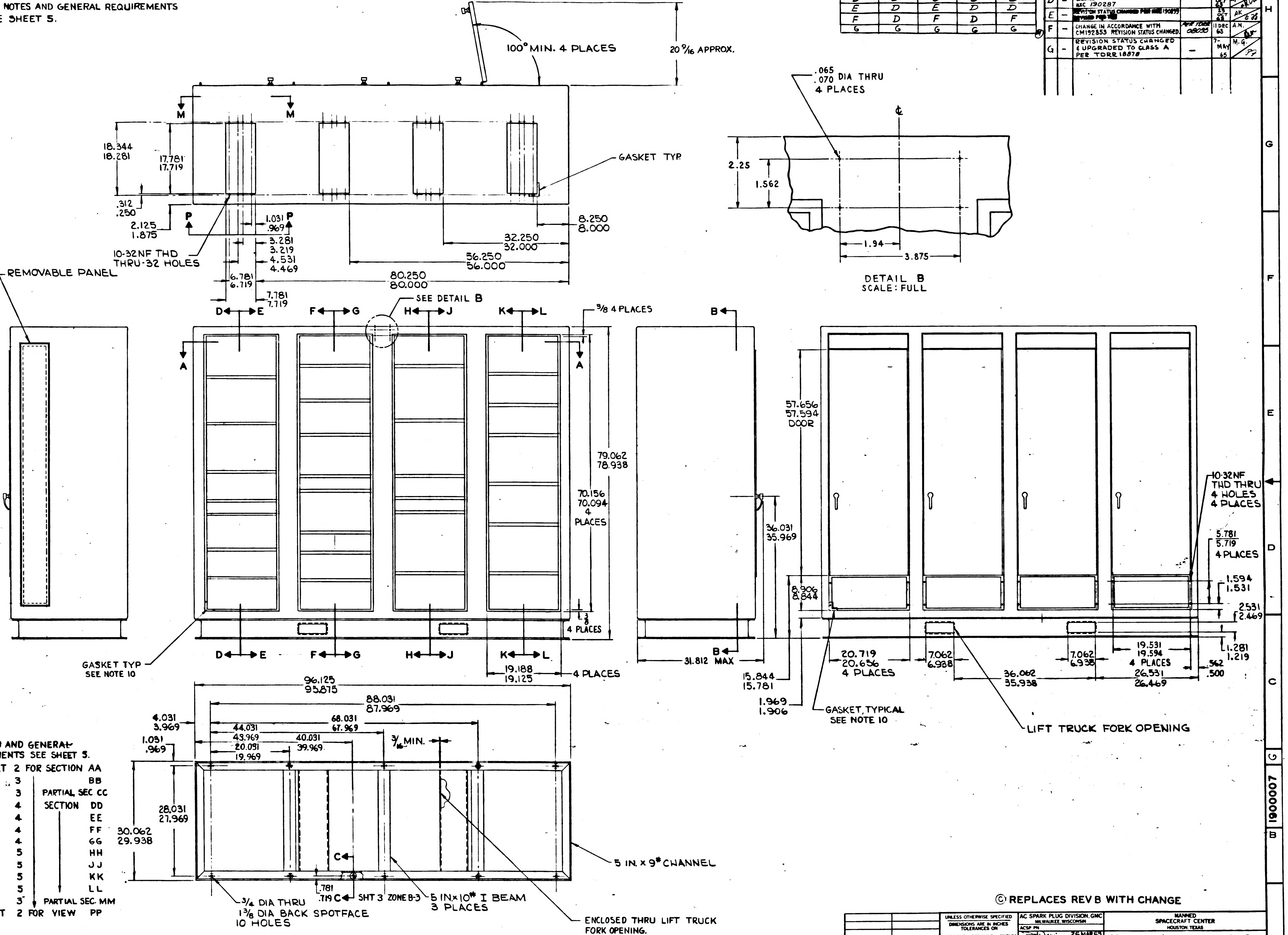
1900031-011	1900004-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +— −— DECIMALS +.02 −.02 ANGLES +− −− DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL 9/13/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY BASIC (APOLLO OPTICS-INERTIAL ANALYZER)
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL	CODE IDENT NO. · SIZE E · 1900007
APPLICATION		CONTRACT NAS9-497	MIT APPROVAL	SCALE 1/4 · SHEET 5 OF 5

1900007 F

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.

REVISION STATUS OF SHEETS				
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5
C	C	C	C	C
D	D	D	D	D
E	D	E	D	D
F	D	F	D	F
G	G	G	G	G

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	[illegible]	4 SEPT 63	TP
D	—	CHANGE IN ACCORDANCE WITH MXC 190287		15 OCT 63	JSH
E	—	REVISION STATUS CHANGED PER [illegible] 190899 REVISED PER [illegible]		25 OCT 63	AK
F	—	CHANGE IN ACCORDANCE WITH CM192853. REVISION STATUS CHANGED.	PER TDRR 08095	11 DEC 63	A.N.
G	—	REVISION STATUS CHANGED & UPGRADED TO CLASS A PER TDRR 18878	—	7-MAY 65	M.G.


100° MIN. 4 PLACES
20 9/16 APPROX.
M
M
18.344
18.281
17.781
17.719
GASKET TYP
.312
.250
2.125
1.875
P
1.031
.969
P
10-32NF THD
THRU-32 HOLES
3.281
3.219
4.531
4.469
32.250
32.000
8.250
8.000
56.250
56.000
80.250
80.000
6.781
6.719
7.781
7.719
REMOVABLE PANEL
SEE DETAIL B
.065
.070 DIA THRU
4 PLACES
2.25
1.562
1.94
3.875
DETAIL B
SCALE: FULL
D E
F G
H J
K L
3/8 4 PLACES
B
A
A
79.062
78.938
70.156
70.094
4 PLACES
3/8
4 PLACES
57.656
57.594
DOOR
36.031
35.969
8.906
8.844
10-32NF
THD THRU
4 HOLES
4 PLACES
5.781
5.719
4 PLACES
1.594
1.531
2.531
2.469
1.281
1.219
GASKET TYP
SEE NOTE 10
D E
F G
H J
K L
19.188
19.125
4 PLACES
B
31.812 MAX
20.719
20.656
4 PLACES
7.062
6.938
36.062
35.938
7.062
6.938
19.531
19.594
4 PLACES
26.531
26.469
.562
.500
15.844
15.781
1.969
1.906
GASKET, TYPICAL
SEE NOTE 10
LIFT TRUCK FORK OPENING
96.125
95.875
88.031
87.969
68.031
67.969
44.031
43.969
40.031
39.969
20.031
19.969
4.031
3.969
1.031
.969
3/16 MIN.
28.031
27.969
30.062
29.938
C
5 IN. x 9# CHANNEL
.781
.719
C
SHT 3 ZONE B-3
3/4 DIA THRU
1 3/8 DIA BACK SPOTFACE
10 HOLES
5 IN x 10# I BEAM
3 PLACES
ENCLOSED THRU LIFT TRUCK
FORK OPENING.

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.

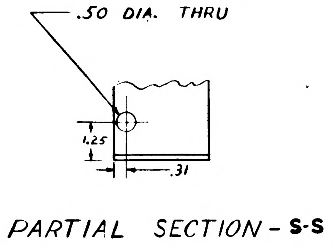
SEE SHEET 2 FOR SECTION AA
3 BB
3 PARTIAL SEC CC
4 SECTION DD
4 EE
4 FF
4 GG
5 HH
5 JJ
5 KK
5 LL
3 PARTIAL SEC. MM
SEE SHEET 2 FOR VIEW PP

Ⓒ REPLACES REV B WITH CHANGE

1900031-011 NEXT ASSY	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ± .02 ANGLES ± 2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
1900004-011 USED ON		DRAWN Weigins 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL L. Geliman 9/23/63	CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER) SPECIFICATION CONTROL DRAWING	
APPLICATION	MATERIAL	NASA APPROVAL MIT APPROVAL	CODE IDENT NO. 99974	SIZE E 1900007
	CONTRACT NAS9-497		SCALE 1/8	SHEET OF 5

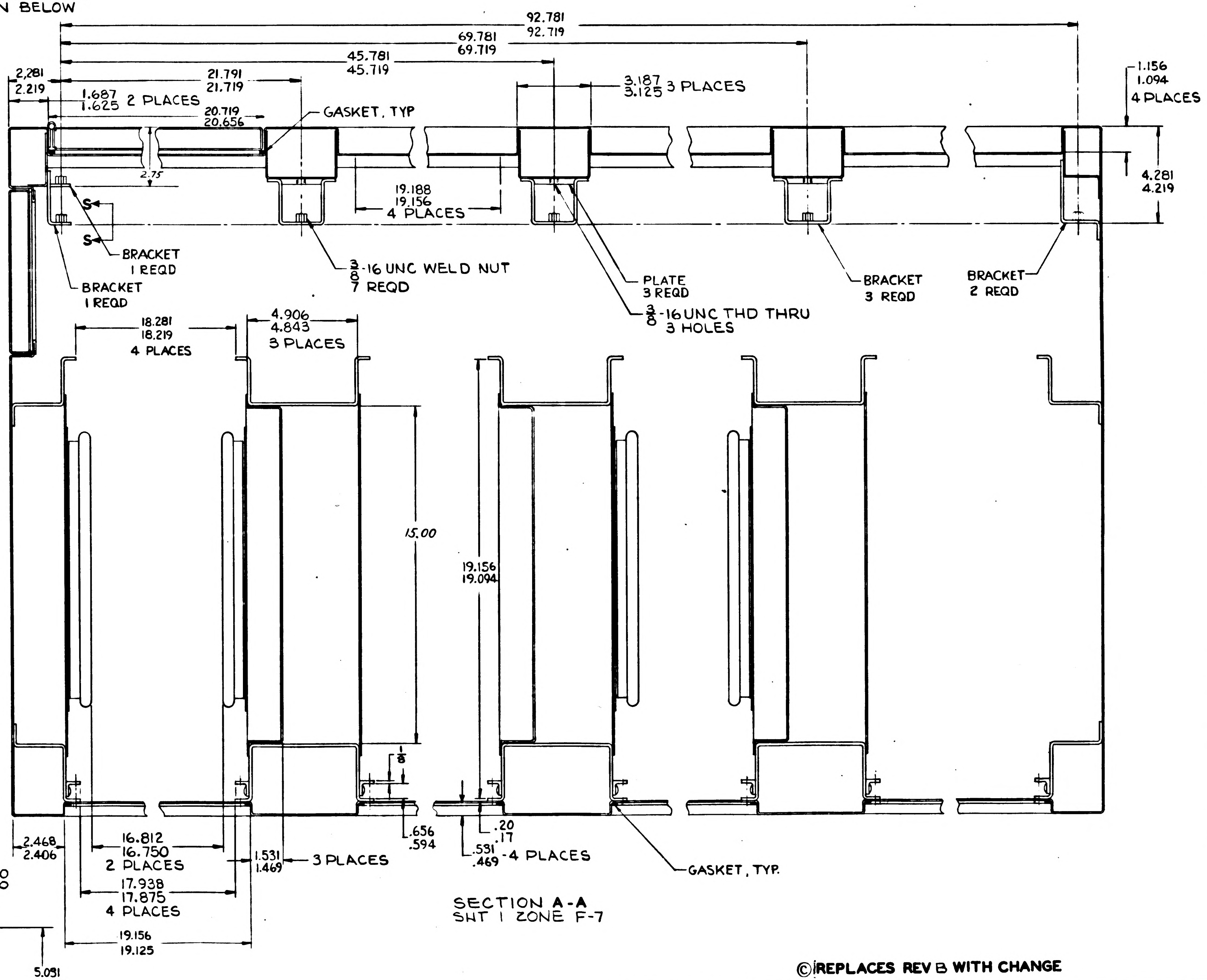
1900007

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	–	REPLACES REVISION B WITH CHANGE PER RR 03407	MXC 189488	4 SEPT 63	T.P.
D	–	CHANGE IN ACCORDANCE WITH MXC 30287 PER TORR 08095		15 OCT 63	DF
G		REVISED & UPGRADED TO CLASS B PER TORR 18878		7-MAY 65	M.G.



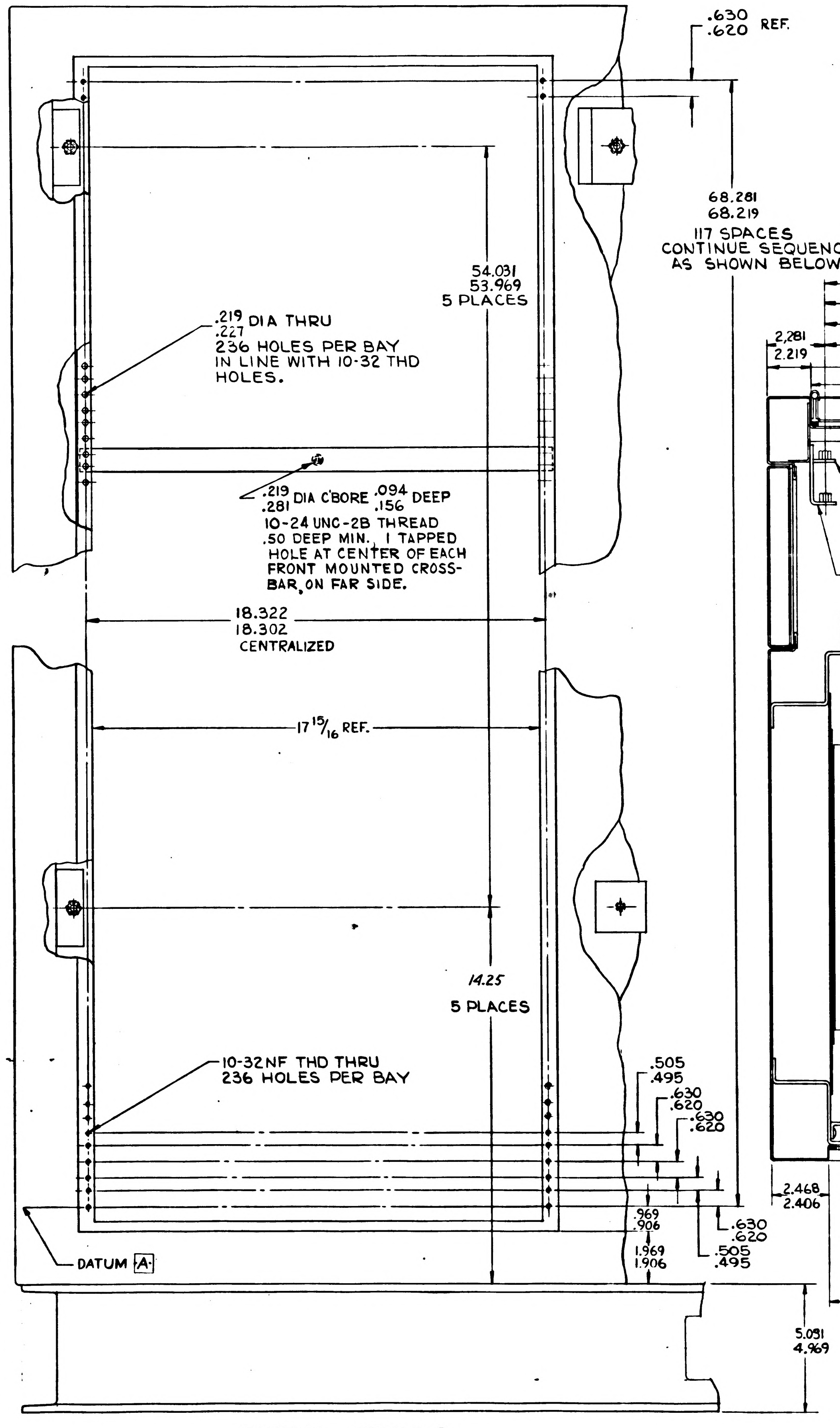
.50 DIA. THRU
1.25
.31

PARTIAL SECTION - S-S



92.781
92.719
69.781
69.719
45.781
45.719
21.791
21.719
2.281
2.219
1.687
1.625 2 PLACES
20.719
20.656
GASKET, TYP
3.187
3.125 3 PLACES
1.156
1.094
4 PLACES
2.75
19.188
19.156
4 PLACES
4.281
4.219
S
S
BRACKET
1 REQD
BRACKET
1 REQD
3/8-16 UNC WELD NUT
7 REQD
PLATE
3 REQD
3/8-16 UNC THD THRU
3 HOLES
BRACKET
3 REQD
BRACKET
2 REQD
18.281
18.219
4 PLACES
4.906
4.843
3 PLACES
15.00
19.156
19.094
1/8
2.468
2.406
16.812
16.750
2 PLACES
1.531
1.469
3 PLACES
.656
.594
.20
.17
.531
.469
4 PLACES
GASKET, TYP.
17.938
17.875
4 PLACES
19.156
19.125

SECTION A-A
SHT 1 ZONE F-7



.630
.620 REF.
68.281
68.219
117 SPACES
CONTINUE SEQUENCE
AS SHOWN BELOW
54.031
53.969
5 PLACES
.219
.227 DIA THRU
236 HOLES PER BAY
IN LINE WITH 10-32 THD
HOLES.
.219
.281 DIA C'BORE .094
.156 DEEP
10-24 UNC-2B THREAD
.50 DEEP MIN. 1 TAPPED
HOLE AT CENTER OF EACH
FRONT MOUNTED CROSS-
BAR ON FAR SIDE.
18.322
18.302
CENTRALIZED
17 15/16 REF.
14.25
5 PLACES
10-32NF THD THRU
236 HOLES PER BAY
.505
.495
.630
.620
.630
.620
.969
.906
1.969
1.906
.630
.620
.505
.495
DATUM A
5.031
4.969

PARTIAL VIEW P-P
SHT 1 ZONE G-7

Ⓒ REPLACES REV B WITH CHANGE

1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + – – –
DECIMALS +.02 -.02
ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

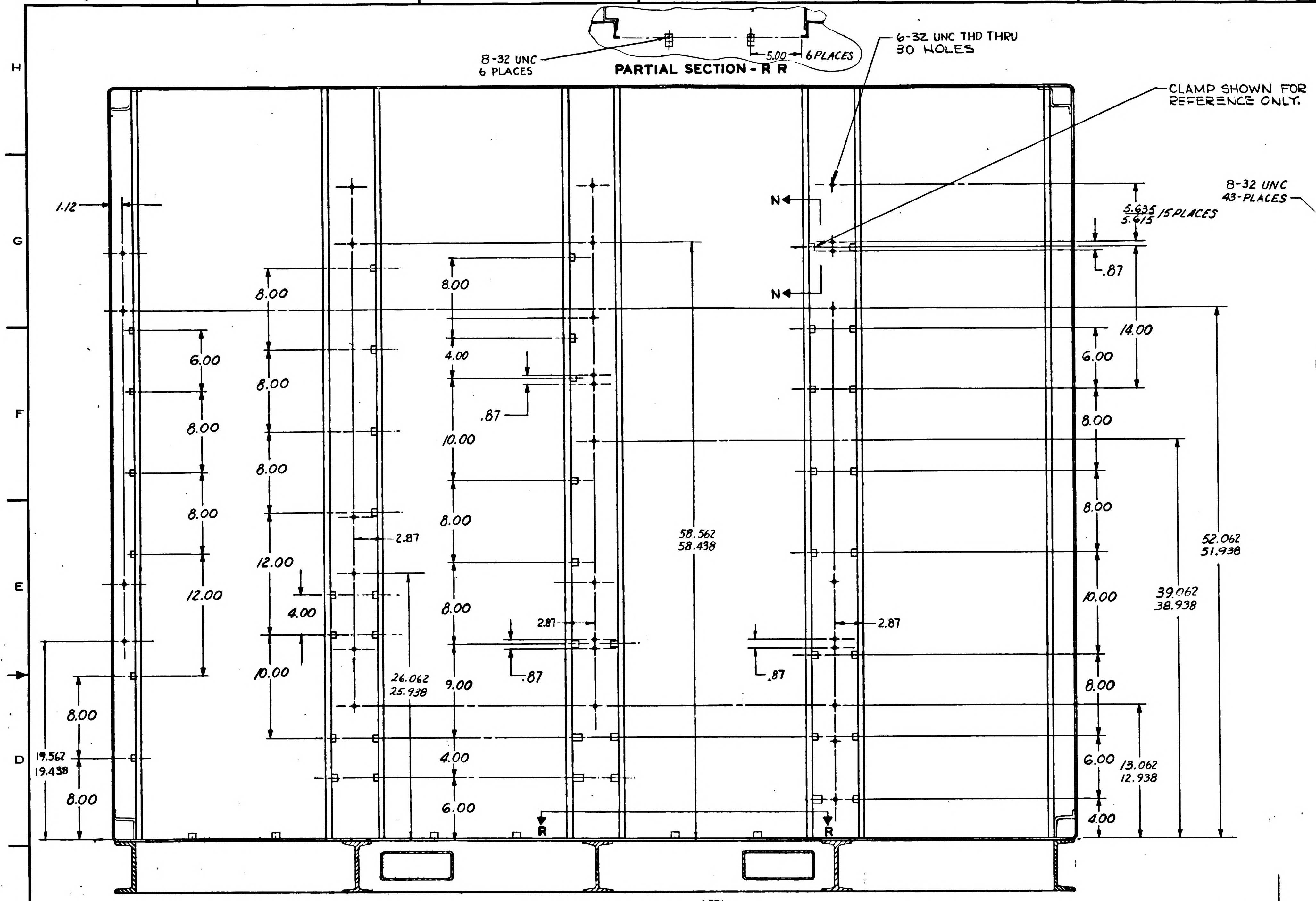
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S T Wenzing DATE 26 MAR 63
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL L Ackerman 9/23/63
NASA APPROVAL 7/4/63
MIT APPROVAL 7/24/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY, BASIC
(APOLLO OPTICS INERTIAL
ANALYZER)

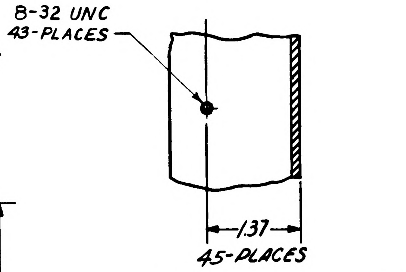
CODE IDENT NO. 99974
SIZE E
1900007
SCALE 1/2
SHEET 2 OF 5

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MIC 189483	4 SEPT 63	T.P.
E	F-2	RELOCATED # 8-32 UNC TAPED HOLES. IN PARTIAL SEC. N-N "43 PLACES" WAS "30 PLACES", PER MIC-190899		23 OCT 63	AK E28
F		CHANGE IN ACCORDANCE WITH CM 192853 PER TDRR 08095		11 DEC 63	AN
G		UPGRADED TO CLASS A PER TDRR 18878		7-MAY 65	R.G.

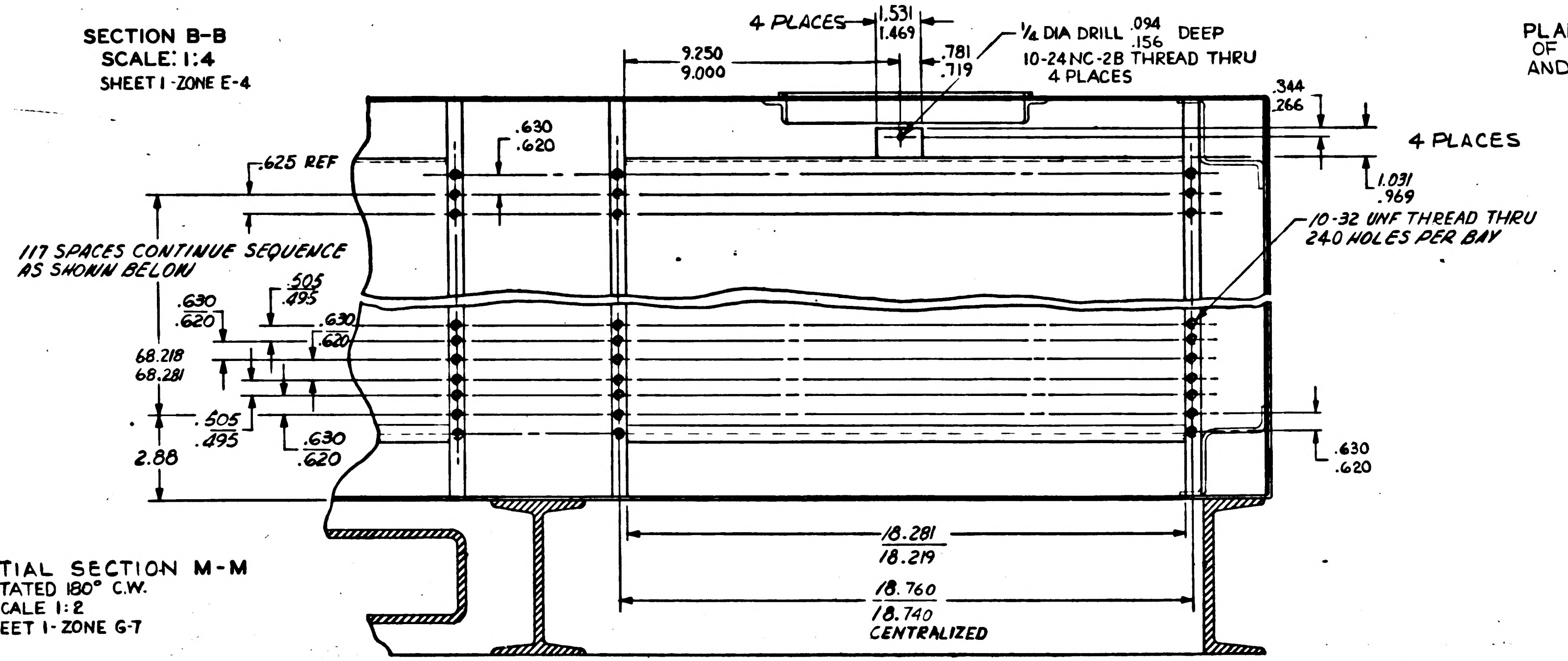

8-32 UNC
6 PLACES
5.00
6 PLACES
6-32 UNC THD THRU
30 HOLES
CLAMP SHOWN FOR REFERENCE ONLY.
N
N
R
R
1.12
5.635
5.615
15 PLACES
.87
14.00
6.00
8.00
8.00
10.00
8.00
6.00
4.00
13.062
12.938
52.062
51.938
39.062
38.938
58.562
58.458
26.062
25.938
19.562
19.438
12.00
10.00
9.00
4.00
2.87
.87

PARTIAL SECTION - R R

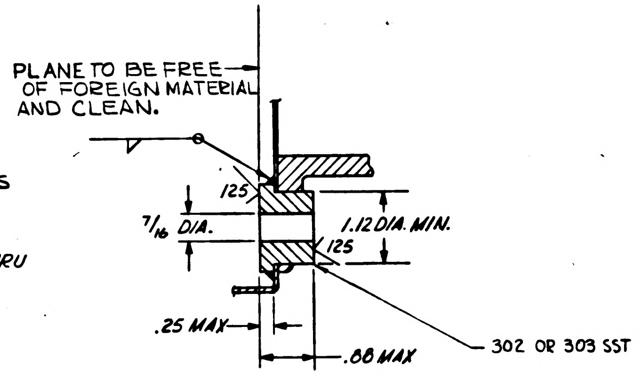
SECTION B-B
SCALE: 1:4
SHEET 1 - ZONE E-4


8-32 UNC
43-PLACES
.137
45-PLACES

PARTIAL SECTION N-N
SCALE: FULL


4 PLACES
1.531
1.469
9.250
9.000
.781
.719
1/4 DIA DRILL .094 .156 DEEP
10-24 NC-2B THREAD THRU
4 PLACES
.344
.266
4 PLACES
1.031
.969
.630
.620
.625 REF
117 SPACES CONTINUE SEQUENCE AS SHOWN BELOW
10-32 UNF THREAD THRU
240 HOLES PER BAY
.505
.495
68.218
68.281
2.88
18.281
18.219
18.760
18.740
CENTRALIZED

PARTIAL SECTION M-M
ROTATED 180° C.W.
SCALE 1:2
SHEET 1 - ZONE G-7


PLANE TO BE FREE OF FOREIGN MATERIAL AND CLEAN.
.125
7/16 DIA.
1.12 DIA. MIN.
.125
.25 MAX
.88 MAX
302 OR 303 SST

PARTIAL SECTION C-C
SCALE: FULL
SHEET 1 ZONE B-3

© PLACES REV B WITH CHANGE

NEXT ASSY	USED ON
1900031-011	1900004-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.02	+2°
$-\frac{1}{64}$	-.02	-2°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN 26 MAR 63
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL 4/3/63
NASA APPROVAL 9/10/63
MIT APPROVAL S. Nagel 9/26/63

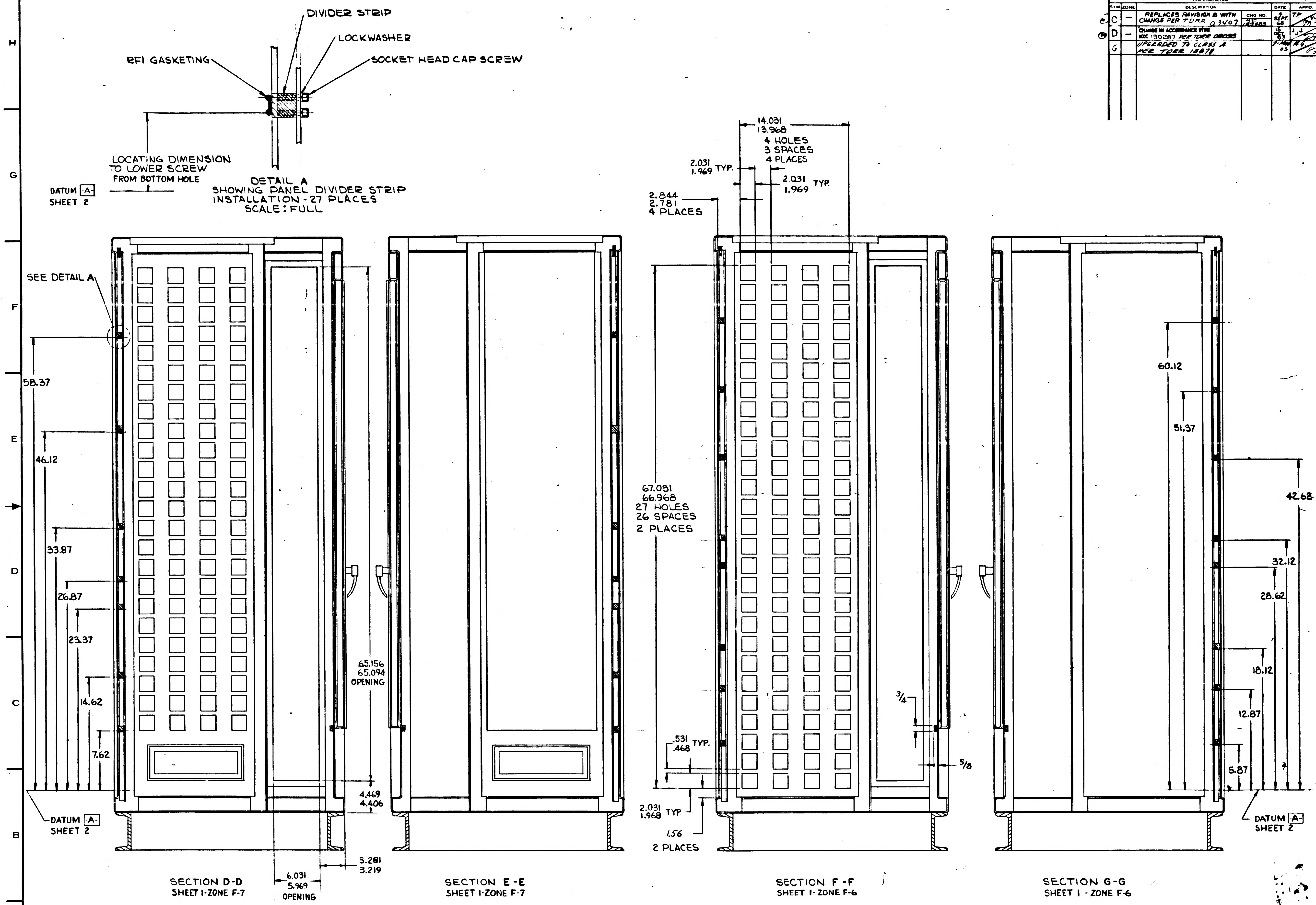
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER)

CODE IDENT NO. 99974
SIZE E
1900007

SCALE NOTED
SHEET 3 OF 5

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MXC 189489	4 SEPT. 63	T.P.
D	—	CHANGE IN ACCORDANCE WITH MXC 190287 PER TDRR 08055		15 OCT 63	J.J.
G		UPGRADED TO CLASS A PER TDRR 18878		7-MAY 65	M.G.



DIVIDER STRIP
LOCKWASHER
RFI GASKETING
SOCKET HEAD CAP SCREW
LOCATING DIMENSION TO LOWER SCREW FROM BOTTOM HOLE
DATUM -A- SHEET 2
SEE DETAIL A
58.37
46.12
33.87
26.87
23.37
14.62
7.62
65.156
65.094
OPENING
4.469
4.406
3.281
3.219
6.031
5.969
OPENING
14.031
13.968
4 HOLES
3 SPACES
4 PLACES
2.031
1.969 TYP.
2.031
1.969 TYP.
2.844
2.781
4 PLACES
67.031
66.968
27 HOLES
26 SPACES
2 PLACES
.531
.468 TYP.
2.031
1.968 TYP.
1.56
2 PLACES
3/4
5/8
60.12
51.37
42.62
32.12
28.62
18.12
12.87
5.87
DATUM -A- SHEET 2

DETAIL A
SHOWING PANEL DIVIDER STRIP INSTALLATION - 27 PLACES
SCALE: FULL

SECTION D-D
SHEET 1-ZONE F-7

SECTION E-E
SHEET 1-ZONE F-7

SECTION F-F
SHEET 1-ZONE F-6

SECTION G-G
SHEET 1 - ZONE F-6

Ⓒ REPLACES REV B WITH CHANGE

1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — —
DECIMALS +.02 −.02
ANGLES + − − −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 26 MAR 63
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL Jahnman 9/23/63
NASA APPROVAL 7/04/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY BASIC
(APOLLO OPTICS-INERTIAL ANALYZER)

CODE IDENT NO. 99974
SIZE E
1900007
SCALE 1/4
SHEET 4 OF 5

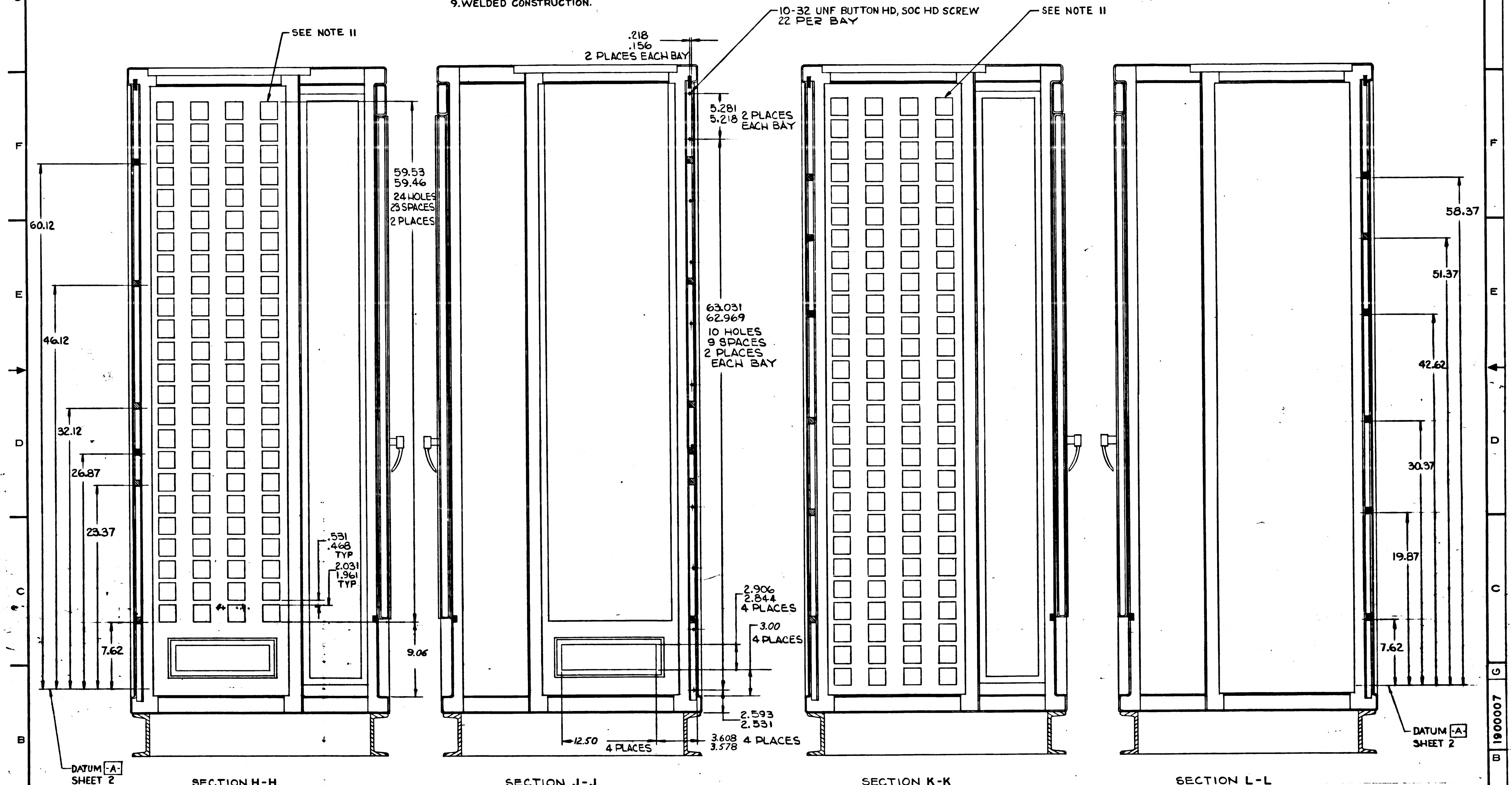
1900007

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. REQUIREMENTS:
   ELECTRO-INTERFERENCE ENVIROMENT CONTROL REQUIREMENT. THE SHIELDING MATERIALS AND CONSTRUCTION SHALL PROVIDE MEANS FOR ATTENUATION OF ELECTROMAGNETIC EMANATIONS FOR MAGNETIC FIELDS ABOVE 150KC AND BELOW 1000 MC.
3. MATERIAL:
   QQ-S-698 STEEL, SHEET AND STRIP, LOW CARBON TYPE COLD ROLLED, COMMERCIAL QUALITY. 16 GAGE OR LARGER THROUGH OUT.
   QQ-S-741 STRUCTURAL SECTION.
4. FINISH:
   PREPARE ALL SURFACES, EXCEPT TAPPED HOLES AND TINNED SURFACES. WITH MIL-P-26915, PRIMER COATING AND FINISH WITH 2 COATS TT-E-529 CLASS B ENAMEL, COLOR 26251 OF FED-STD-595 PER MIL-STD-808-F101.
5. MUST BE FREE FROM BURRS AND SHARP EDGES.
6. APPLY 37-40 IN-LBS OF TORQUE TO ALL 10-32 SCREWS.
7. ALL THREADS SHALL BE OF CLASS 2.
8. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-267).
   ORIGINAL SOURCE OF SUPPLY:
   SUPER STEEL PRODUCTS CO.
   1244 N. FOURTH STREET
   MILWAUKEE 12, WISCONSIN
   PART NO. 1495-A.
9. WELDED CONSTRUCTION.
10. 7/32 DIA MAX HOLE IN GASKET TO CLEAR 10-32 SCREWS.
11. CLOSURE PANELS TO COVER $\frac{2}{3}$ OF THE AIR OPENINGS. TO BE SUPPLIED WITH EACH CABINET.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MIC 189483	4 SEPT. 63	T.P.
F		CHANGE IN ACCORDANCE WITH CM192853 PER TDRR 08095		11 DEC 63	A.N.
G		UPGRADED TO CLASS A PER TDRR 18878		7-NOV 66	N.G.



10-32 UNF BUTTON HD, SOC HD SCREW 22 PER BAY
SEE NOTE 11
SEE NOTE 11
.218
.156
2 PLACES EACH BAY
5.281
5.218 2 PLACES EACH BAY
59.53
59.46
24 HOLES
23 SPACES
2 PLACES
63.031
62.969
10 HOLES
9 SPACES
2 PLACES
EACH BAY
60.12
46.12
32.12
26.87
23.37
7.62
9.06
.531
.468
TYP
2.031
1.961
TYP
2.906
2.844
4 PLACES
3.00
4 PLACES
2.593
2.531
12.50
4 PLACES
3.608
3.578 4 PLACES
58.37
51.37
42.62
30.37
19.87
7.62
DATUM -A-
SHEET 2
DATUM -A-
SHEET 2

SECTION H-H
SHT 1 ZONE F-5

SECTION J-J
SHT 1 ZONE F-5

SECTION K-K
SHT 1 ZONE F-5

SECTION L-L
SHT 1 ZONE F-5

©REPLACES REV B WITH CHANGE

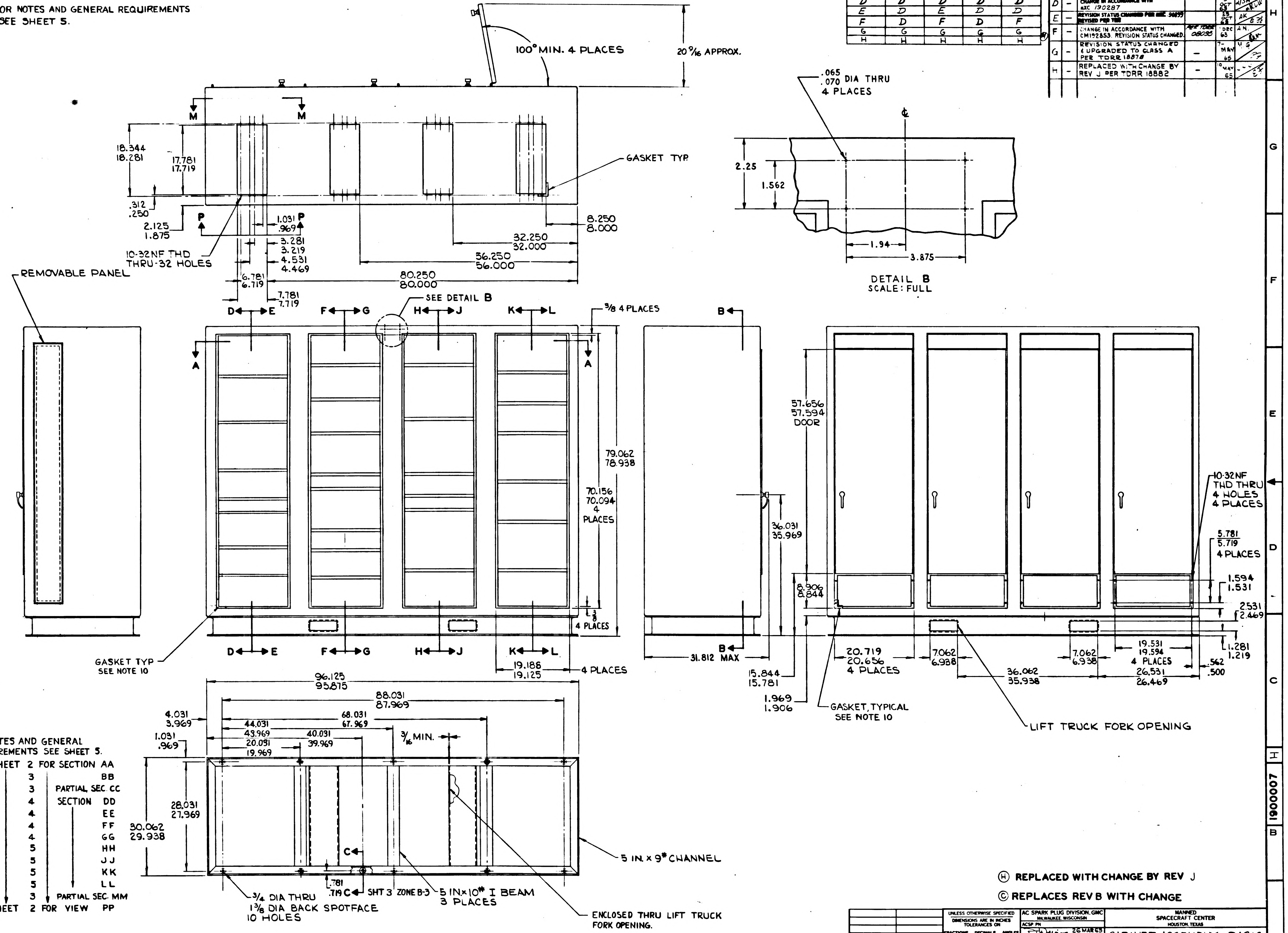
1900031-011 NEXT ASSY	1900004-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − − − DECIMALS +.02 −.02 ANGLES + − − − DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL 9/13/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY BASIC (APOLLO OPTICS-INERTIAL ANALYZER)
APPLICATION		MATERIAL CONTRACT NAS9-497	NASA APPROVAL MIT APPROVAL 9/26/63	CODE IDENT NO. 99974 SIZE E 1900007 SCALE 1/4 SHEET 5 OF 5

REVISION STATUS OF SHEETS				
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5
C	C	C	C	C
D	D	D	D	D
E	D	E	D	D
F	D	F	D	F
G	G	G	G	G
H	H	H	H	H

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	182483	4 SEPT 63	T.P.
D	—	CHANGE IN ACCORDANCE WITH MXC 190287		15 OCT 63	d/SH
E	—	REVISION STATUS CHANGED PER MXC 90899 REVISED PER TDR		25 OCT 63	AK
F	—	CHANGE IN ACCORDANCE WITH CM192853. REVISION STATUS CHANGED.	PER TDRR 08095	DEC 63	A.N.
G	—	REVISION STATUS CHANGED & UPGRADED TO CLASS A PER TDRR 18878	—	7-MAY 65	M.G.
H	—	REPLACED WITH CHANGE BY REV J PER TDRR 18882	—	10 MAY 65	

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.



100° MIN. 4 PLACES
20 9/16 APPROX.
M
M
18.344
18.281
17.781
17.719
GASKET TYP.
.312
.250
2.125
1.875
P
1.031
.969
P
3.281
3.219
4.531
4.469
10-32NF THD THRU-32 HOLES
8.250
8.000
32.250
32.000
56.250
56.000
80.250
80.000
6.781
6.719
7.781
7.719
REMOVABLE PANEL
.065
.070 DIA THRU
4 PLACES
2.25
1.562
1.94
3.875
DETAIL B
SCALE: FULL
SEE DETAIL B
D E
F G
H J
K L
3/8 4 PLACES
A
A
B
B
79.062
78.938
70.156
70.094
4 PLACES
3/8
4 PLACES
GASKET TYP
SEE NOTE 10
19.186
19.125
4 PLACES
31.812 MAX
57.656
57.594
DOOR
36.031
35.969
8.906
8.844
15.844
15.781
1.969
1.906
GASKET, TYPICAL
SEE NOTE 10
20.719
20.656
4 PLACES
7.062
6.938
36.062
35.938
7.062
6.938
19.531
19.594
4 PLACES
26.531
26.469
LIFT TRUCK FORK OPENING
10-32NF THD THRU 4 HOLES 4 PLACES
5.781
5.719
4 PLACES
1.594
1.531
2.531
2.469
1.281
1.219
.562
.500
96.125
95.875
88.031
87.969
68.031
67.969
44.031
43.969
40.031
39.969
20.031
19.969
4.031
3.969
1.031
.969
3/16 MIN.
28.031
27.969
30.062
29.938
C
C
.781
.719
SHT 3 ZONE B-3
5 IN. × 9# CHANNEL
5 IN × 10# I BEAM
3 PLACES
3/4 DIA THRU
1 3/8 DIA BACK SPOTFACE
10 HOLES
ENCLOSED THRU LIFT TRUCK FORK OPENING.

FOR NOTES AND GENERAL REQUIREMENTS SEE SHEET 5.

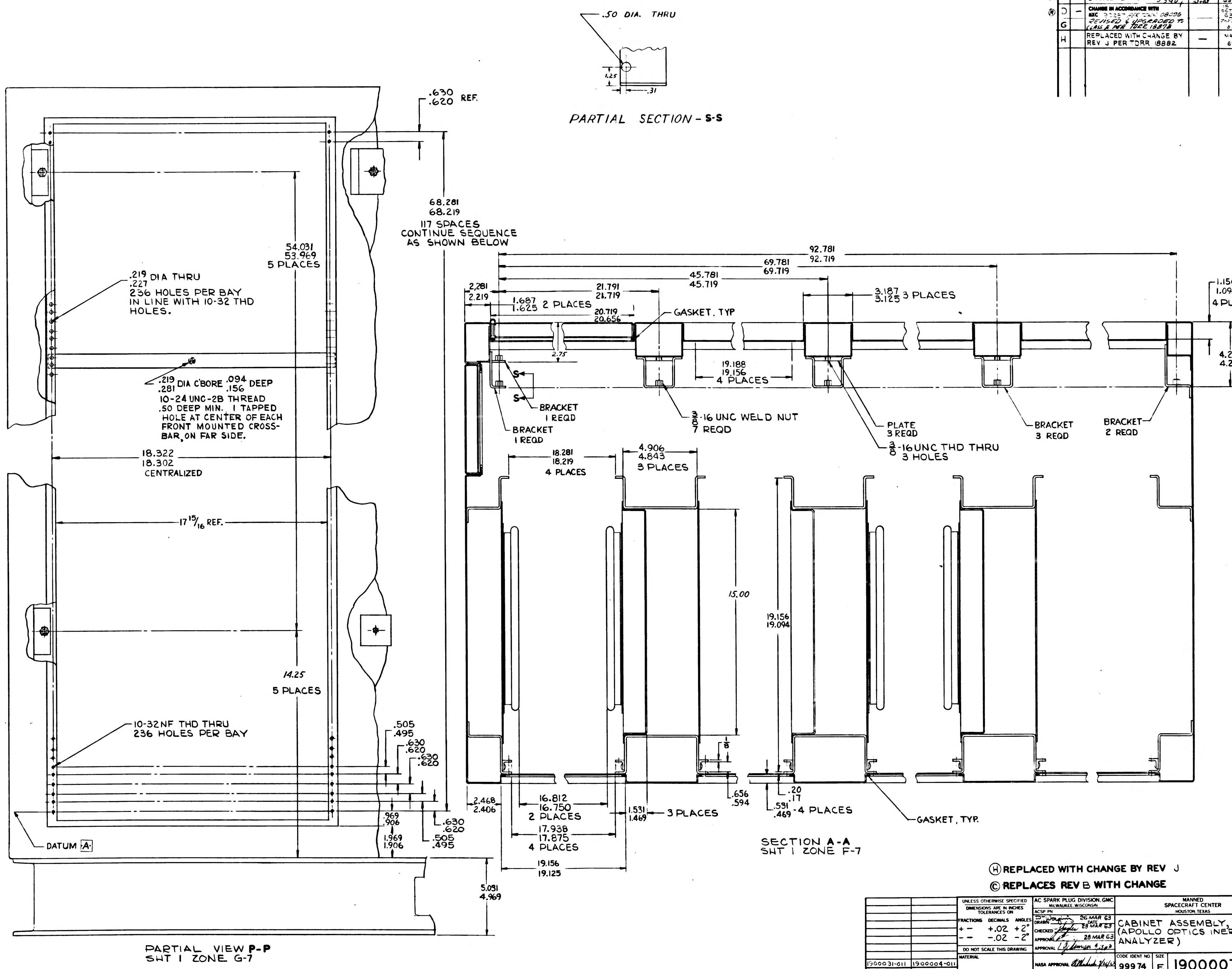
SEE SHEET 2 FOR SECTION AA
3 BB
3 PARTIAL SEC. CC
4 SECTION DD
4 EE
4 FF
4 GG
5 HH
5 JJ
5 KK
5 LL
3 PARTIAL SEC. MM
SEE SHEET 2 FOR VIEW PP

Ⓗ REPLACED WITH CHANGE BY REV J

Ⓒ REPLACES REV B WITH CHANGE

1900031-011 NEXT ASSY	1900004-011 USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ±.02 ANGLES ±2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL	DRAWN Weyers 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL L. Feldman 9/23/63	CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER) SPECIFICATION CONTROL DRAWING
		CONTRACT NAS 9-497	NASA APPROVAL INT APPROVAL	CODE IDENT NO. 99974 SIZE E 1900007 SCALE 1/8 SHEET 1 OF 5

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MXC 03489	4 SEPT. 63	T.P.
D	—	CHANGE IN ACCORDANCE WITH MXC 90287 PER TDRR 08095		15 OCT 63	
G		REVISED & UPGRADED TO CLASS B PER TDRR 18878	—	7-MAY 65	
H		REPLACED WITH CHANGE BY REV J PER TDRR 18882	—	MAY 65	



.50 DIA. THRU
1.25
.31
PARTIAL SECTION - S-S
.630
.620 REF.
68.281
68.219
117 SPACES CONTINUE SEQUENCE AS SHOWN BELOW
54.031
53.969
5 PLACES
.219
.227 DIA THRU
236 HOLES PER BAY IN LINE WITH 10-32 THD HOLES.
.219
.281 DIA C'BORE .094
.156 DEEP
10-24 UNC-2B THREAD .50 DEEP MIN. 1 TAPPED HOLE AT CENTER OF EACH FRONT MOUNTED CROSS-BAR ON FAR SIDE.
18.322
18.302
CENTRALIZED
17 15/16 REF.
14.25
5 PLACES
10-32NF THD THRU 236 HOLES PER BAY
.505
.495
.630
.620
.630
.620
.969
.906
1.969
1.906
.630
.620
.505
.495
DATUM A
5.031
4.969
PARTIAL VIEW P-P
SHT 1 ZONE G-7
92.781
92.719
69.781
69.719
45.781
45.719
21.791
21.719
20.719
20.656
2.281
2.219
1.687
1.625 2 PLACES
3.187
3.125 3 PLACES
1.156
1.094
4 PLACES
GASKET, TYP
2.75
19.188
19.156
4 PLACES
4.281
4.219
S
S
BRACKET
1 REQD
BRACKET
1 REQD
3/8-16 UNC WELD NUT
7 REQD
PLATE
3 REQD
3/8-16 UNC THD THRU
3 HOLES
BRACKET
3 REQD
BRACKET
2 REQD
18.281
18.219
4 PLACES
4.906
4.843
3 PLACES
15.00
19.156
19.094
1/8
2.468
2.406
16.812
16.750
2 PLACES
1.531
1.469
3 PLACES
.656
.594
.20
.17
.531
.469
4 PLACES
GASKET, TYP.
17.938
17.875
4 PLACES
19.156
19.125
SECTION A-A
SHT 1 ZONE F-7

Ⓗ REPLACED WITH CHANGE BY REV J

© REPLACES REV B WITH CHANGE

1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+2°
— —	-.02	-2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

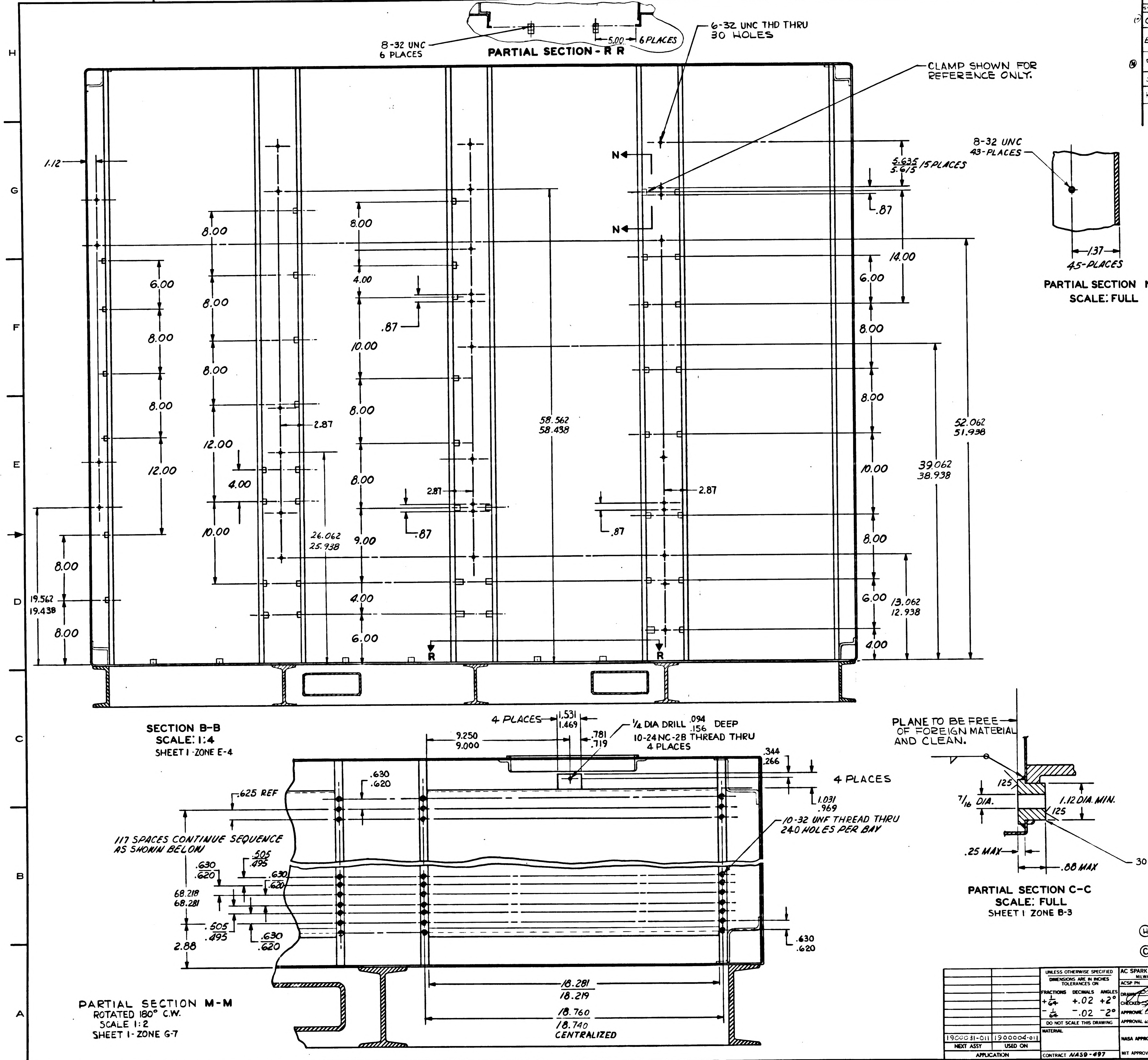
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P.T. Wenzing DATE 26 MAR 63
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY, BASIC
(APOLLO OPTICS INERTIAL
ANALYZER)

CODE IDENT NO. 99974
SIZE E
1900007
SCALE 1/2
SHEET 2 OF 5

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03467	162483	2 SEPT 63	
E	F-2	RELOCATED 8-32 UNC TAPED HOLES. IN PARTIAL SEC. N-N "43 PLACES" WAS "30 PLACES"; PER MIC-190899		23 OCT 63	AK
F		CHANGE IN ACCORDANCE WITH CM 192853 PER TDRR 08095		11 DEC 63	AN
G		UPGRADED TO CLASS A PER TDRR 18878		7-MAY 65	
H		REPLACED WITH CHANGE BY REV J PER TDRR 18882		MAY 65	



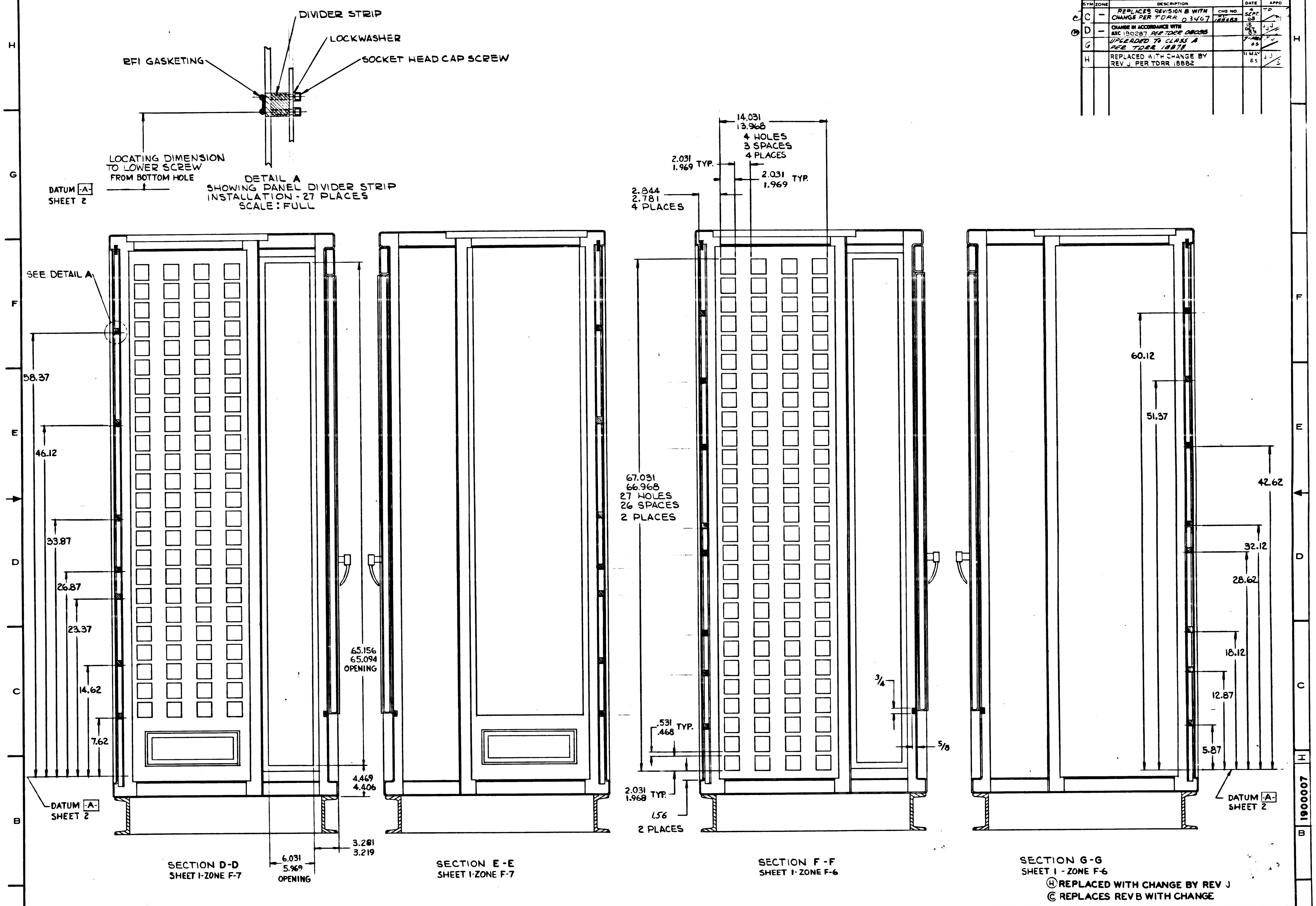
8-32 UNC
6 PLACES
5.00
6 PLACES
PARTIAL SECTION - R R
6-32 UNC THD THRU
30 HOLES
CLAMP SHOWN FOR REFERENCE ONLY.
N
N
R
R
1.12
5.635
5.615
15 PLACES
.87
14.00
8.00
6.00
4.00
10.00
12.00
9.00
2.87
26.062
25.938
58.562
58.438
52.062
51.938
39.062
38.938
13.062
12.938
19.562
19.438
8-32 UNC
43-PLACES
.137
45-PLACES
PARTIAL SECTION N-N
SCALE: FULL
SECTION B-B
SCALE: 1:4
SHEET 1 - ZONE E-4
4 PLACES
1.531
1.469
9.250
9.000
.781
.719
1/4 DIA DRILL .094 .156 DEEP
10-24 NC-2B THREAD THRU
4 PLACES
.344
.266
4 PLACES
1.031
.969
.630
.620
.625 REF
117 SPACES CONTINUE SEQUENCE AS SHOWN BELOW
.505
.495
68.218
68.281
2.88
10-32 UNF THREAD THRU
240 HOLES PER BAY
18.281
18.219
18.760
18.740
CENTRALIZED
PARTIAL SECTION M-M
ROTATED 180° C.W.
SCALE 1:2
SHEET 1 - ZONE G-7
PLANE TO BE FREE OF FOREIGN MATERIAL AND CLEAN.
.125
7/16 DIA.
1.12 DIA. MIN.
.125
.25 MAX
.88 MAX
302 OR 303 SST
PARTIAL SECTION C-C
SCALE: FULL
SHEET 1 ZONE B-3

Ⓗ REPLACED WITH CHANGE BY REV J

Ⓒ RE PLACES REV B WITH CHANGE

1900031-011 NEXT ASSY 1900004-011 USED ON APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $+\frac{1}{64}$ $-\frac{1}{64}$ DECIMALS +.02 -.02 ANGLES +2° -2° DO NOT SCALE THIS DRAWING MATERIAL CONTRACT NAS9-497	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN DATE 26 MAR 63 CHECKED 28 MAR 63 APPROVAL 28 MAR 63 APPROVAL 4/23/63 NASA APPROVAL MIT APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY, BASIC (APOLLO OPTICS INERTIAL ANALYZER) CODE IDENT NO. 99974 SCALE NOTED	SIZE E 1900007 SHEET 3 OF 5

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C	–	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MXC 189483	4 SEPT. 63	TD
D	–	CHANGE IN ACCORDANCE WITH MXC 190287 PER TDRR 08095		15 OCT. 63	JJ
G		UPGRADED TO CLASS A PER TDRR 18878		7-MAY 65	
H		REPLACED WITH CHANGE BY REV J PER TDRR 18882		11 MAY 65	JJ



DIVIDER STRIP
LOCKWASHER
RFI GASKETING
SOCKET HEAD CAP SCREW
LOCATING DIMENSION TO LOWER SCREW FROM BOTTOM HOLE
DATUM -A- SHEET 2
DETAIL A
SHOWING PANEL DIVIDER STRIP INSTALLATION - 27 PLACES
SCALE: FULL
SEE DETAIL A
58.37
46.12
33.87
26.87
23.37
14.62
7.62
65.156
65.094
OPENING
4.469
4.406
3.281
3.219
6.031
5.969
OPENING
DATUM -A- SHEET 2
14.031
13.968
4 HOLES
3 SPACES
4 PLACES
2.031
1.969 TYP.
2.031
1.969 TYP.
2.844
2.781
4 PLACES
67.031
66.968
27 HOLES
26 SPACES
2 PLACES
.531
.468 TYP.
2.031
1.968 TYP.
1.56
2 PLACES
3/4
5/8
60.12
51.37
42.62
32.12
28.62
18.12
12.87
5.87
DATUM -A- SHEET 2
SECTION D-D
SHEET 1-ZONE F-7
SECTION E-E
SHEET 1-ZONE F-7
SECTION F-F
SHEET 1-ZONE F-6
SECTION G-G
SHEET 1 - ZONE F-6
Ⓗ REPLACED WITH CHANGE BY REV J
Ⓒ REPLACES REV B WITH CHANGE
1900007

1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ –	+.02	+ –
– –	–.02	– –

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 26 MAR 63
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL Johnson 9/23/63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY BASIC
(APOLLO OPTICS-INERTIAL
ANALYZER)

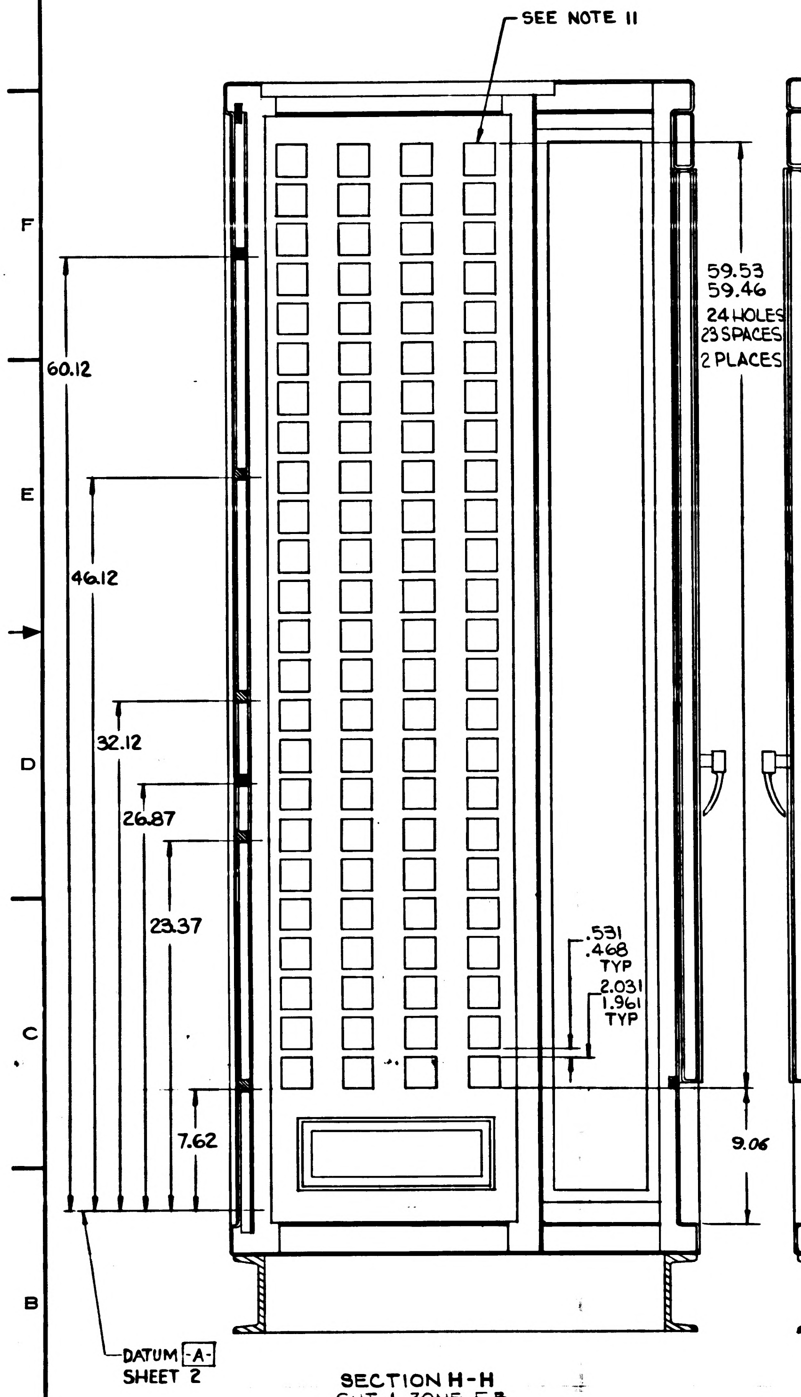
CODE IDENT NO. 99974
SIZE E
1900007
SCALE 1/4
SHEET 4 OF 5

NOTES:

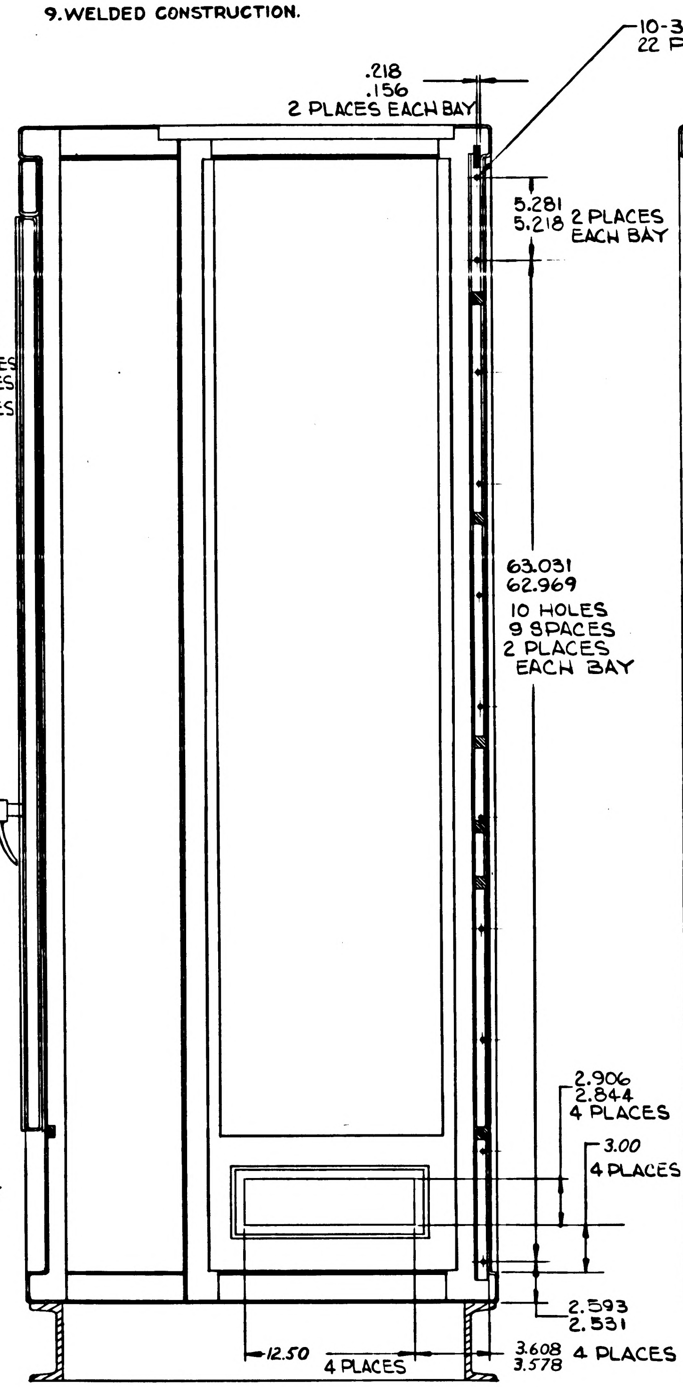
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. REQUIREMENTS:
   ELECTRO-INTERFERENCE ENVIROMENT CONTROL REQUIREMENT. THE SHIELDING MATERIALS AND CONSTRUCTION SHALL PROVIDE MEANS FOR ATTENUATION OF ELECTROMAGNETIC EMANATIONS FOR MAGNETIC FIELDS ABOVE 150KC AND BELOW 1000 MC.
3. MATERIAL:
   QQ-S-698 STEEL, SHEET AND STRIP, LOW CARBON TYPE COLD ROLLED, COMMERCIAL QUALITY. 16 GAGE OR LARGER THROUGH OUT.
   QQ-S-741 STRUCTURAL SECTION.
4. FINISH:
   PREPARE ALL SURFACES, EXCEPT TAPPED HOLES AND TINNED SURFACES. WITH MIL-P-26915, PRIMER COATING AND FINISH WITH 2 COATS TT-E-529 CLASS B ENAMEL, COLOR 26251 OF FED-STD-595 PER MIL-STD-808-F101.
5. MUST BE FREE FROM BURRS AND SHARP EDGES.
6. APPLY 37-40 IN-LBS OF TORQUE TO ALL 10-32 SCREWS.
7. ALL THREADS SHALL BE OF CLASS 2.
8. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-267).
   ORIGINAL SOURCE OF SUPPLY:
   SUPER STEEL PRODUCTS CO.
   1244 N. FOURTH STREET
   MILWAUKEE 12, WISCONSIN
   PART NO. 1495-A.
9. WELDED CONSTRUCTION.
10. 7/32 DIA MAX HOLE IN GASKET TO CLEAR 10-32 SCREWS.
11. CLOSURE PANELS TO COVER $\frac{2}{3}$ OF THE AIR OPENINGS. Ⓜ

REVISIONS

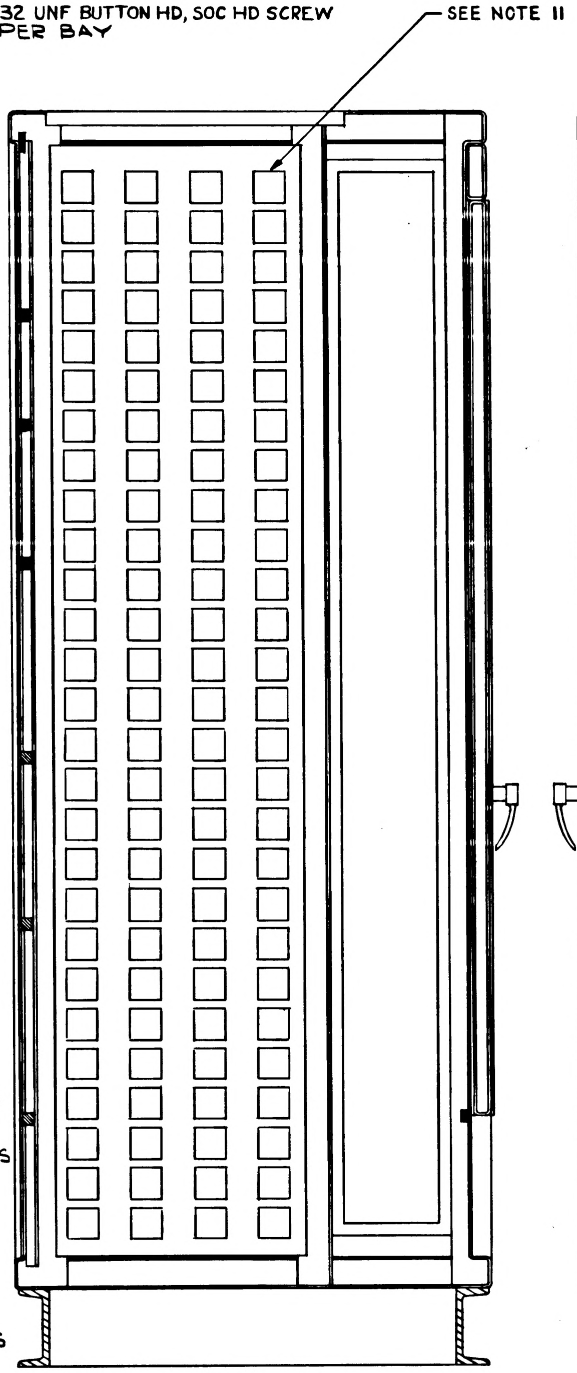
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓐ C	—	REPLACES REVISION B WITH CHANGE PER TDRR 03407	MRC 189483	4 SEPT. 63	TD
Ⓜ F		CHANGE IN ACCORDANCE WITH CM192853 PER TDRR 08095		11 DEC 63	A.N.
G		UPGRADED TO CLASS A PER TDRR 18878		7-MAY 65	N.G.
H		REPLACED WITH CHANGE BY REV J PER TDRR 18882		MAY 65	- - -


SEE NOTE 11
59.53
59.46
24 HOLES
23 SPACES
2 PLACES
60.12
46.12
32.12
26.87
23.37
.531
.468
TYP
2.031
1.961
TYP
7.62
9.06
DATUM -A-
SHEET 2

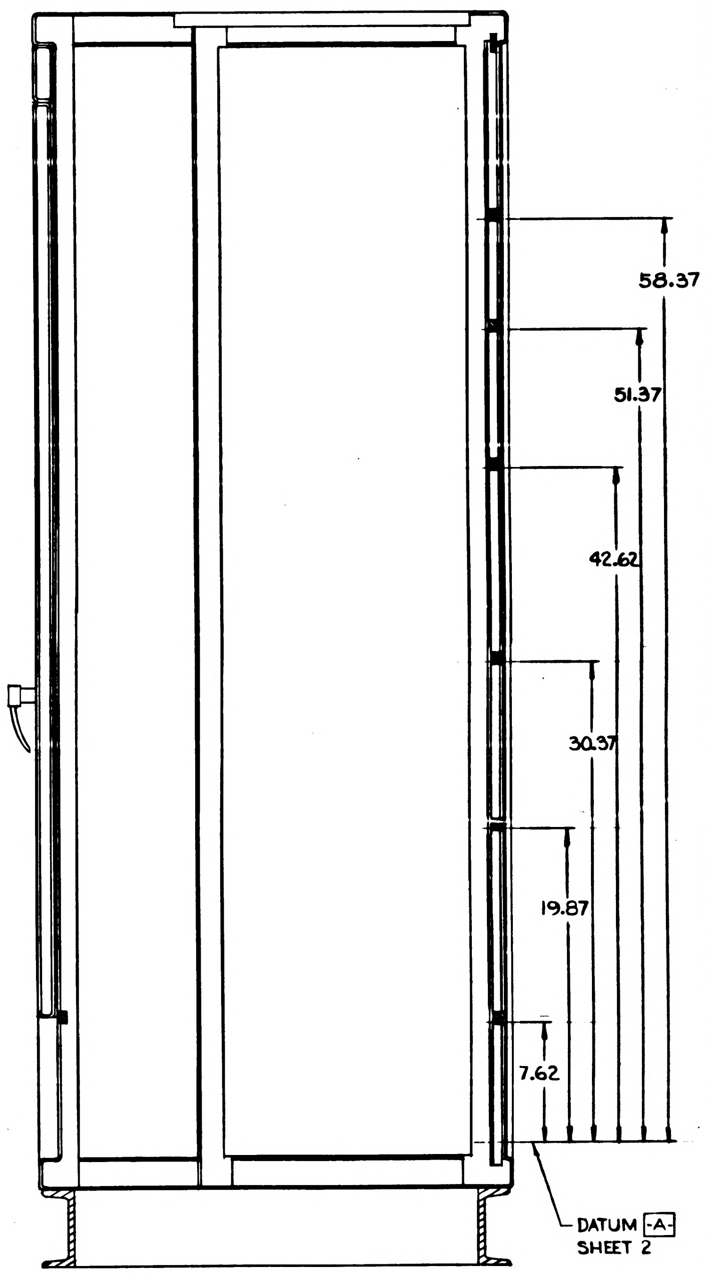
SECTION H-H
SHT 1 ZONE F-5


.218
.156
2 PLACES EACH BAY
10-32 UNF BUTTON HD, SOC HD SCREW
22 PER BAY
5.281
5.218
2 PLACES
EACH BAY
63.031
62.969
10 HOLES
9 SPACES
2 PLACES
EACH BAY
2.906
2.844
4 PLACES
3.00
4 PLACES
2.593
2.531
12.50
4 PLACES
3.608
3.578
4 PLACES

SECTION J-J
SHT 1 ZONE F-5



SECTION K-K
SHT 1 ZONE F-5


58.37
51.37
42.62
30.37
19.87
7.62
DATUM -A-
SHEET 2

SECTION L-L
SHT 1 ZONE F-5

Ⓗ REPLACED WITH CHANGE BY REV J

Ⓒ REPLACES REV B WITH CHANGE

1900031-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — —
DECIMALS +.02 −.02
ANGLES + — — —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 26 MAR 63
CHECKED 28 MAR 63
APPROVAL 28 MAR 63
APPROVAL 9/13/63
NASA APPROVAL
MIT APPROVAL 9/26/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY BASIC
(APOLLO OPTICS-INERTIAL
ANALYZER)

CODE IDENT NO. 99974
SIZE E
1900007
SCALE 1/4
SHEET 5 OF 5

6000061

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED	D.O. 51837	6 AUG 63	AFB

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 DATE 8/21/63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			14			1016067-003	CHAIN-SAFETY
			12			1016066-001	FERRULE-END
			6			1016068-003	HANDLE
			4			1015975	CONNECTOR RECEPT. ELEC.
			2			1015791-015	SLIDE ASSY
			2			1015791-016	SLIDE ASSY
			2			NAS 607-4-8P	PIN-STRAIGHT
			2			1016065-013	PIN-QUICK RELEASE
			2			1016065-011	PIN-QUICK RELEASE
			14			1016065-012	PIN-QUICK RELEASE
			1			1016064	CONNECTOR-PLUG ELEC.
			2			NAS 607-8-18P	PIN-STRAIGHT
			11			1016022-001	FASTENER-CATCH
			4			1016028-001	HANDLE
			2			1016070-008	CASTER-RIGID W/BRAKE
			2			1016069-008	CASTER-SWIVEL
			11			1016022-002	FASTENER-STRIKE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900167	1900075	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN A.J. FLUDER 19-MAR-63
MALIKOWSKI DATE 25 MAR 63
CHECKED
APPROVAL AMBay 25 MAR 63
APPROVAL 20 Aug 63
NASA APPROVAL 8/13/63
MIT APPROVAL 8/21/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, APOLLO GUIDANCE EQUIPMENT

ASSEMBLY

CODE IDENT NO.
SIZE C
1900009
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

6000061

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED	D.O. 51837	6 AUG 63	AH
B		CHANGE IN ACCORDANCE WITH MXC 189580		5 SEP 63	JGL
C	-	*REPLACED WITH CHANGE BY REV. D PER CM-192910 PER TDRR 06151*	-	12-DEC-63 2-4-64	M.G

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 DATE 8/21/63

Ⓒ REPLACED WITH CHANGE BY REV D

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			1900593	TRANSPORTATION CART ASSY (INSEP.)
			1			1900594	TOW BAR ASS'Y (INSEP.)
			1			1900595	COVER ASS'Y (INSEP.)
			1			1900596	DOOR-EQUIPMENT ASS'Y. (INSEP.)
			1			1900597	BOX-CONNECTOR ASS'Y. (INSEP.)
			1			1900598	PANEL-CONNECTOR ASSY. (INSEP.)
			4			1900599	BRACKET-ANGLE
			1			1900687	IMU MOUNTING PANEL ASS'Y.
			1			1900688-011	D&C MOUNTING PANEL ASS'Y.
			4			1015975	CONNECTOR RECEPT. ELEC.
			2			1015791-015	SLIDE ASSY
			2			1015791-016	SLIDE ASSY
			1			1900604	PSA MOUNTING BRACKET
			1			1900605	AGC MOUNTING BRACKET
			1			1900708	WIRE LIST "AA"
			1			1900709	HINGE-CONTINUOUS
			1			1016064	CONNECTOR-PLUG ELEC.
			2			NAS 607-8-18P	PIN-STRAIGHT
			1			1900711	TOP PLATE
			2			1900737	SUPPORT-ANGLE
			2			1016070-008	CASTER-RIGID W/BRAKE
			2			1016069-008	CASTER-SWIVEL
			1			1900753-011	NAVIGATION BASE OPTICS MOUNTING PANEL ASSY
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900167	1900075	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19-MAR-63
CHECKED MALIKOWSKI 25 MAR 63
APPROVAL AMBay 25 MAR 63
APPROVAL 20 Aug 63
NASA APPROVAL 8/21/63
MIT APPROVAL 8/21/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART,
APOLLO GUIDANCE EQUIPMENT
ASSEMBLY

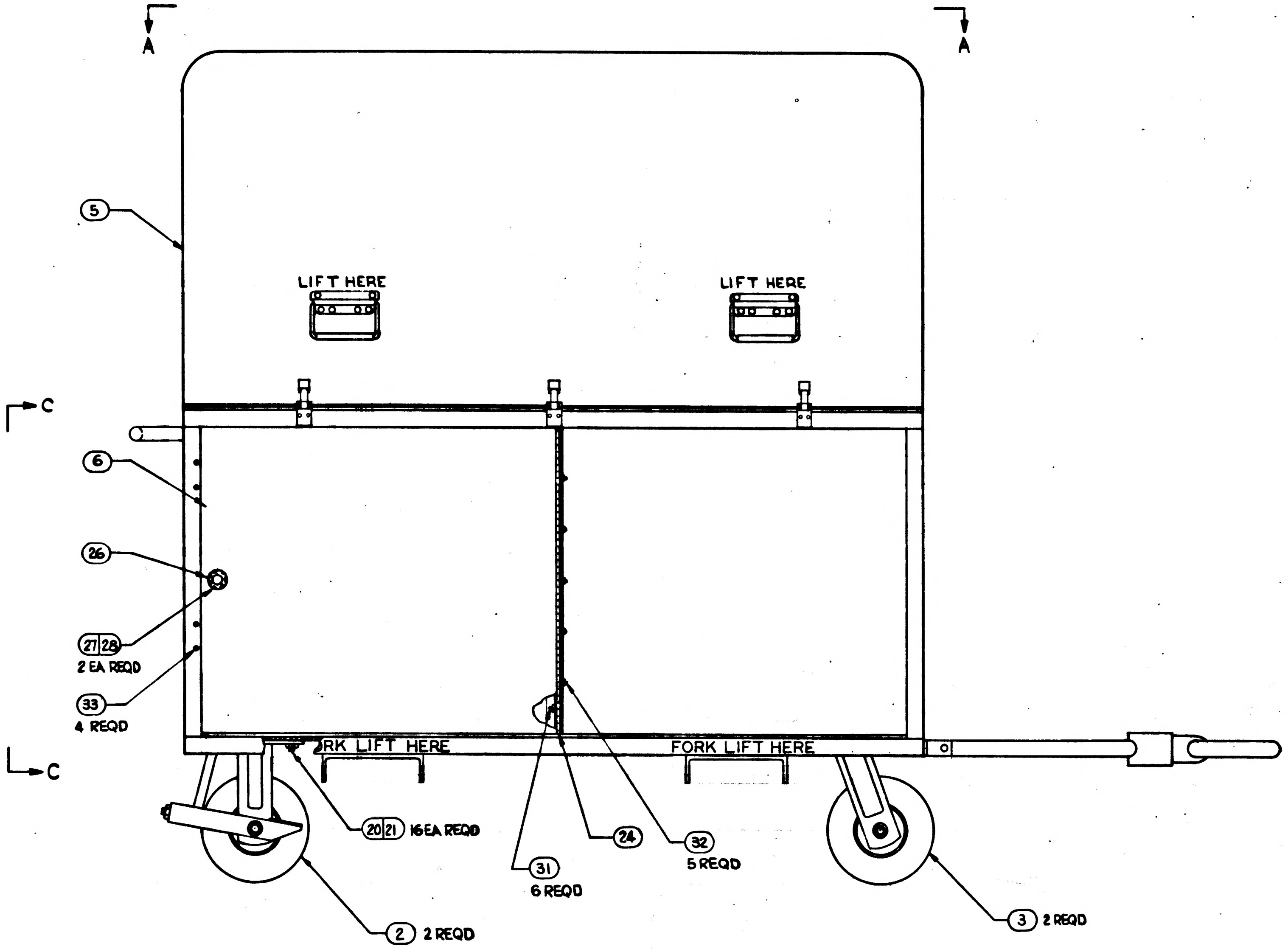
CODE IDENT NO.
SIZE C
1900009
SCALE —
SHEET

MIL 1078C—P

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS (18) & (33) ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM (36) IN ACCORDANCE WITH ND1002023. LETTERS AND NUMBERS TO BE .12 HIGH.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D	—	REPLACES REV "C" WITH CHANGE PER CM-192910 CHANGE NO OF SHEETS FROM 1 TO 2 REVISION STATUS ADDED	—	12-DEC-63	H.G
E		CHANGE IN ACCORDANCE WITH CM 193649 PER TDRR 06151		17	GG



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 DATE 8/21/64

				4		38	MS16624-4050	RING, RETAINING
				4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
				1		36	1901304-206	NAMEPLATE
				2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4				6		34	1015931-193	SCREW-FLAT HEAD
SEE NOTES 3&4				4		33	1015826-316	SCREW-FLAT HEAD
				5		32	MS35223-6	SCREW-PAN HEAD
				6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4				12		30	1015826-304	SCREW-FLAT HEAD
				1		29	1900708	WIRE LIST A-A
SEE NOTE 4				2		28	1016831-245	SCREW-FLAT HEAD
				2		27	MS20365-832	NUT-SELF LOCKING
SEE NOTE 4				1		26	1016099-001	LATCH-DOOR
				1		25	1900711	TOP PLATE
				1		24	1900709	CONTINUOUS HINGE
				2		23	1900904	PIN, TOE BAR
				16		22	MS35217-52	SCREW-PAN HD
				16		21	MS20365-820C	NUT-SELF LOCKING
SEE NOTE 4				16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4				6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3				4		18	1900599	BRACKET, ANGLE
SEE NOTE 4				2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4				2		16	1015791-015	SLIDE ASSY (R.H.)
				1		15	1016064	CONNECTOR-PLUG ELEC.
				4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
				1		13	1900605	AGC MOUNTING BRACKET
				1		12	1900952-011	PSA MOUNTING BRACKET ASSY
				1		11	1900753-011	NAV. BASE OPTICS MTG PANEL
				1		10	1900688-011	D&C MTG PANEL ASSY
				1		9	1900687	IMU MTG PANEL ASSY
				1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
				1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
				1		6	1900596	DOOR, EQUIPMENT
				1		5	1900595	COVER (INSEP ASSY)
				1		4	1900594	TOW BAR (INSEP ASSY)
				2		3	1016069-008	CASTER, SWIVEL
				2		2	1016070-008	CASTER, RIGID W/BRAKE
				1		1	1900593	TRANSPORTATION CART (SEP ASSY)
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

E	E
D	D
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

(D) REPLACES REV C WITH CHANGE

1900030-011	1900030-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

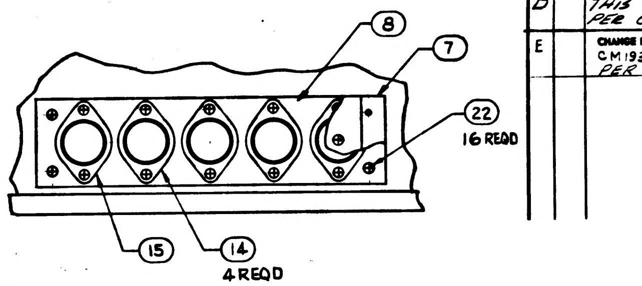
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DATE 19 MAR 63
CHECKED Wilson 27 Nov 63
APPROVAL 27 Nov 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

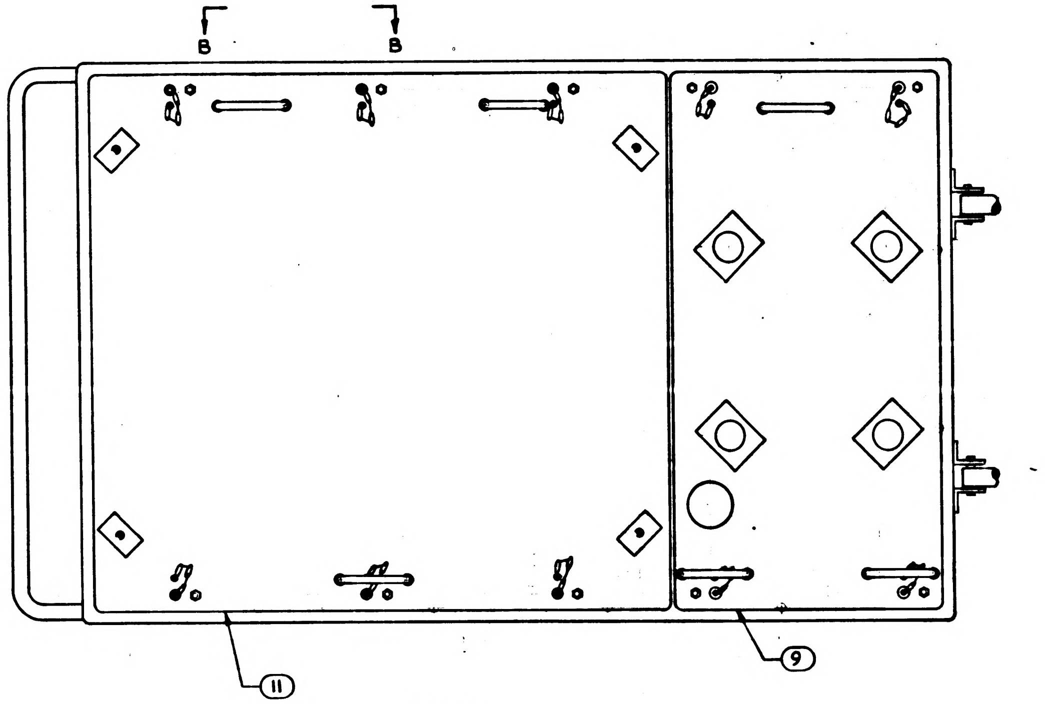
CODE IDENT NO.
SIZE E
1900009
SCALE 1/4
SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		THIS SHEET ADDED PER CM-192910		12-DEC-63	
E		CHANGE IN ACCORDANCE WITH CM193649 PER TDRR 06 51		17 JAN 64	GG L.C

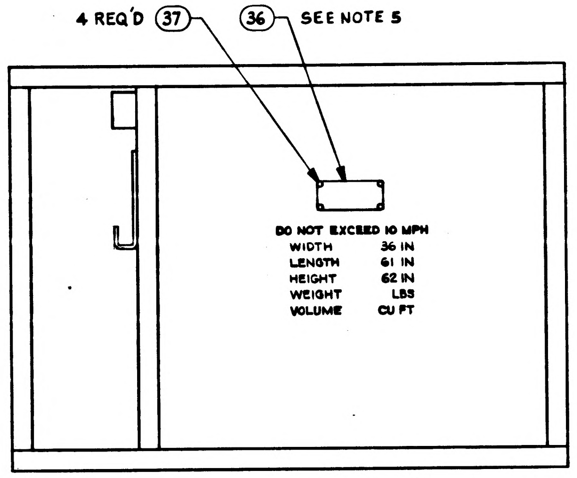


8
7
22
16 REQD
15
14
4 REQD

PARTIAL VIEW B-B
1:2 SCALE



VIEW A-A
COVER REMOVED
⑩ REMOVED
⑨ & ⑪ MOUNTED



4 REQ'D 37
36 SEE NOTE 5

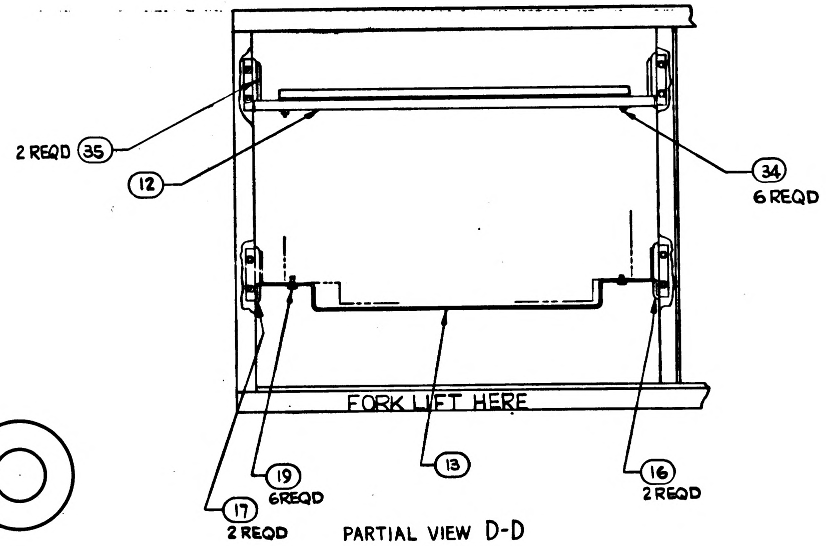
DO NOT EXCEED 10 MPH

WIDTH	36 IN
LENGTH	61 IN
HEIGHT	62 IN
WEIGHT	LBS
VOLUME	CU FT

VIEW C-C

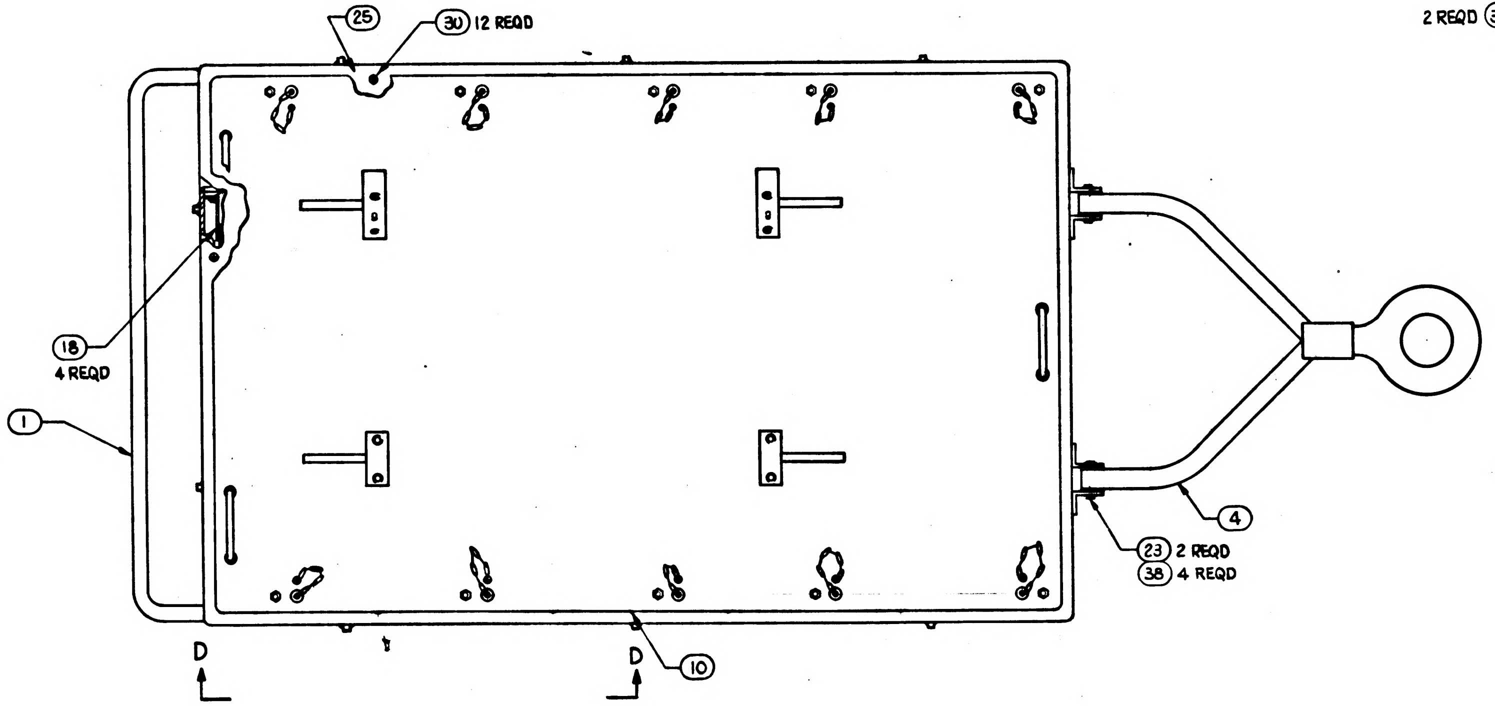
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 DATE 8/21/63



2 REQD 35
12
34
6 REQD
FORK LIFT HERE
19
6REQD
13
16
2 REQD
17
2 REQD

PARTIAL VIEW D-D
DOOR REMOVED



25
30 12 REQD
18
4 REQD
1
4
23 2 REQD
38 4 REQD
D
D
10

VIEW A-A
COVER REMOVED
⑩ MOUNTED ON TOP PLATE

Ⓓ THIS SHEET ADDED

1900030-011	1900030-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Summerville DATE 9 Aug 63
CHECKED Wilson 27 Nov 63
APPROVAL Nagera 27 Nov 63
APPROVAL 4/3/64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

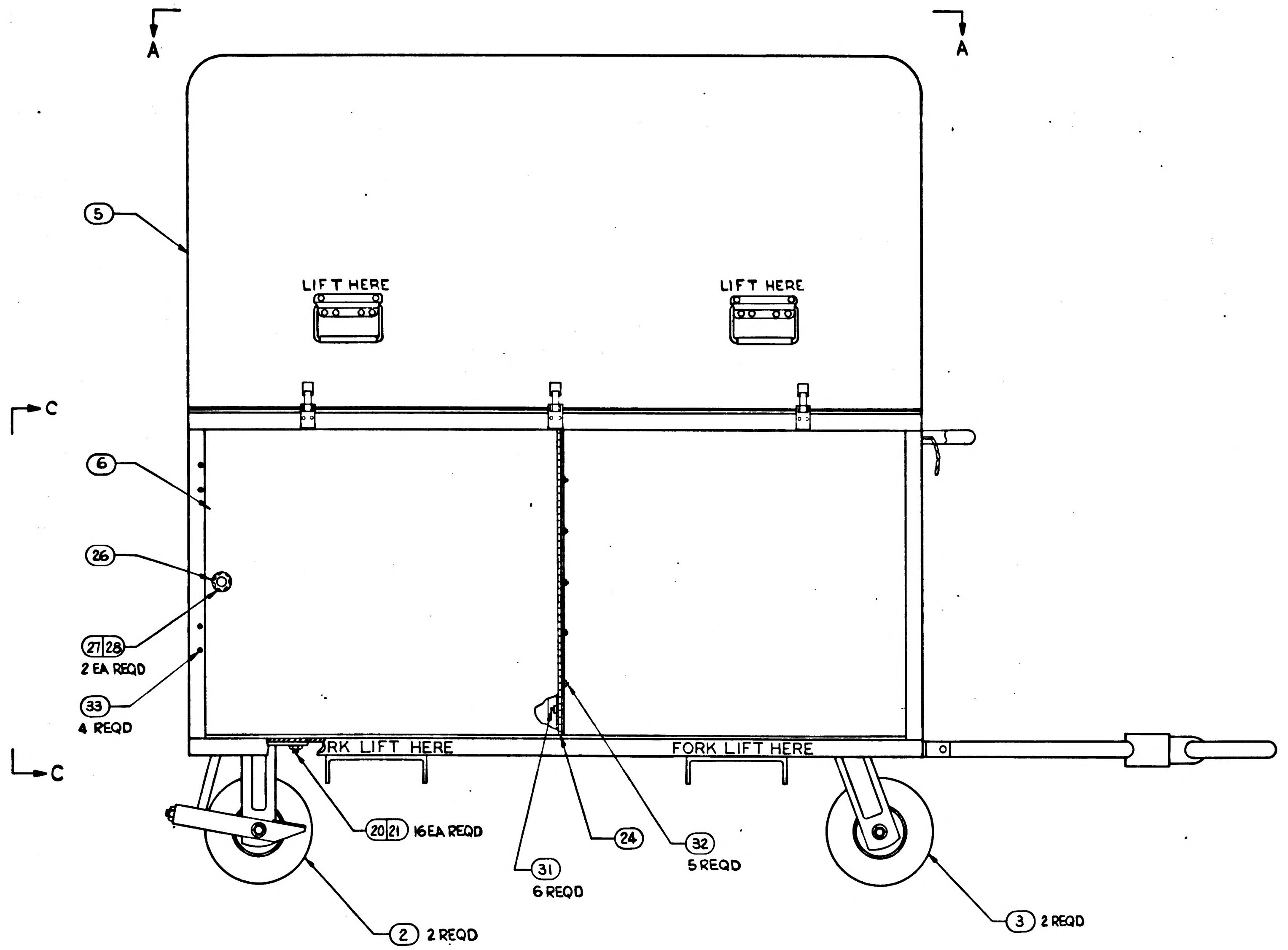
TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO
SIZE E
1900009
SCALE 1:4
SHEET 2 OF 2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS ⑱ & ㉝ ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM ㊱ IN ACCORDANCE WITH ND1002023. LETTERS AND NUMBERS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM ㊹ TO ITEM (49) SECURELY.

REVISIONS						
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD	
D	—	REPLACES REV "C" WITH CHANGE PER CM-192910 CHANGE NO OF SHEETS FROM 1 TO 2 REVISION STATUS ADDED	—	12-DEC 63	M.G.	
E		CHANGE IN ACCORDANCE WITH CM 193649 PER TDRR 06151		17 2-4-64	GG WH	
F		CHANGE IN ACCORDANCE WITH CM 195864		12 MAR 64	RK	EF
G		CHANGE IN ACCORDANCE WITH CM 196725 REVISED CUSTOMER DATA 08392 V2-64	—	17 APR 64	JB	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 DATE 8/21/63

				1		51	AN960C416	WASHER, FLAT (1897006-042)
				1		50	AN 335-4	NUT, HEX. (1896987-040)
				1		49	1016336-001	SNAP - SWIVEL
				1		48	MS 35338-82	WASHER, LOCK
SEE NOTE 4				1		47	1015916-001	EYE BOLT
				1		46	AN960-C4L	WASHER, FLAT (1897006-034)
SEE NOTE 4				1		45	1006783-20	SCREW, BUTTON HEAD
SEE NOTE 4 & 6				1		44	1016067-12	CHAIN, SAFETY
				4		43	MS 35217-071	SCREW-MACH PAN HEAD
				8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4				6		41	1006783-62	SCREW - BUTTON HEAD
SEE NOTE 4				18		40	1015826-304	SCREW - FLAT HEAD
SEE NOTE 4				12		39	1015826-300	SCREW - FLAT HEAD
				4		38	MS16624-4050	RING, RETAINING
				4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
				1		36	1901304-206	NAMEPLATE
				2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4				6		34	1015831-193	SCREW-FLAT HEAD
SEE NOTES 3 & 4				4		33	1015826-324	SCREW-FLAT HEAD
				5		32	MS35223-6	SCREW-PAN HEAD
				6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4				12		30	1015826-304	SCREW-FLAT HEAD
				1		29	1900708	WIRE LIST A-A
SEE NOTE 4				2		28	1015831-245	SCREW-FLAT HEAD
				2		27	MS20365-832A	NUT-SELF LOCKING
SEE NOTE 4				1		26	1016099-001	LATCH-DOOR
				1		25	1900711	TOP PLATE
				1		24	1900709	CONTINUOUS HINGE
				2		23	1900904	PIN, TOE BAR
				16		22	MS35217-52	SCREW-PAN HD
				16		21	MS20365-820 C	NUT-SELF LOCKING
SEE NOTE 4				16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4				6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3				4		18	1900599	BRACKET, ANGLE
SEE NOTE 4				2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4				2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4				1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4				4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
				1		13	1900605	AGC MOUNTING BRACKET
				1		12	1900952-011	PSA MOUNTING BRACKET ASSY
				1		11	1900753-011	NAV. BASE OPTICS MTG PANEL
				1		10	1900688-011	D & C MTG PANEL ASSY
				1		9	1900687	IMU MTG PANEL ASSY
				1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
				1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
				1		6	1900596	DOOR, EQUIPMENT
				1		5	1900595	COVER (INSEP ASSY)
				1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4				2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4				2		2	1016070-008	CASTER, RIGID W/BRAKE
				1		1	1900593	TRANSPORTATION CART (INSEP ASSY)
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

SHEET 1	SHEET 2
G	G
F	F
E	E
D	D

REVISION STATUS OF SHEETS

Ⓓ REPLACES REV C WITH CHANGE

1900030-011	1900030-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

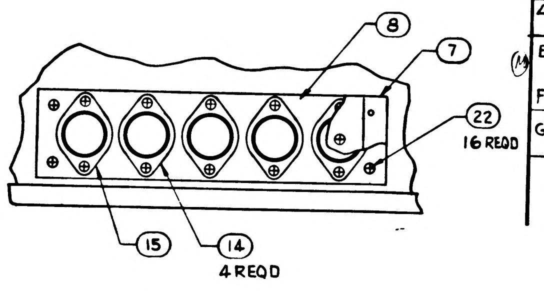
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Summerville DATE 19 MAR 63
CHECKED Wilson 27 Nov 63
APPROVAL Winberg 27 Nov 63
APPROVAL Gelman 2/3/64
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

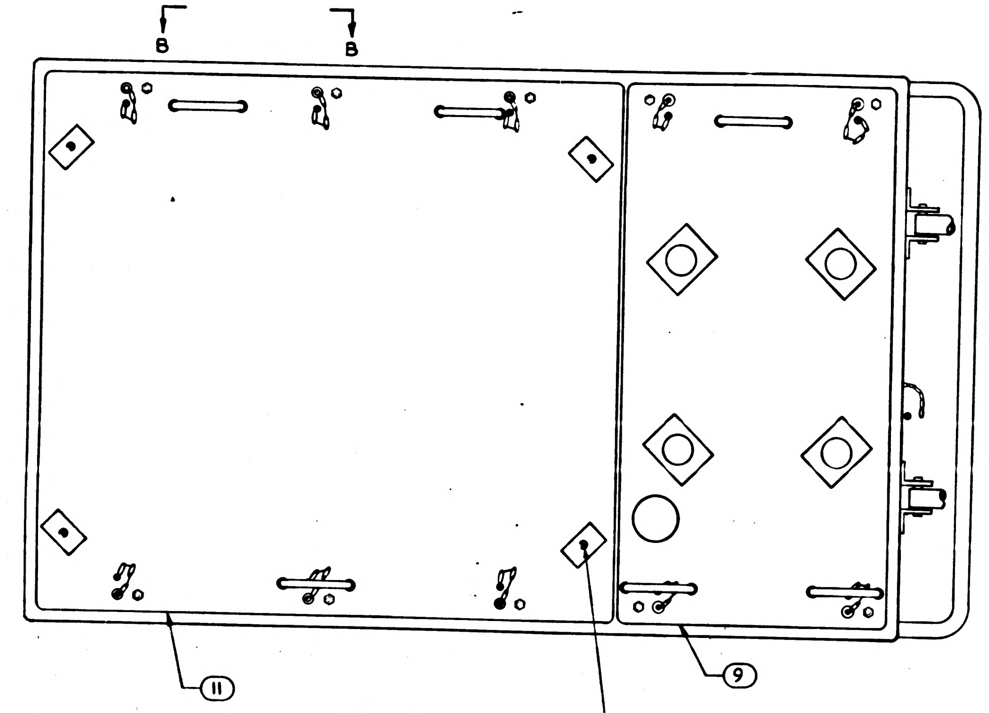
CODE IDENT NO.
SIZE E
1900009
SCALE 1/4
SHEET 1 OF 2

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER CM-192910		12-DEC-63	M.G.
E		CHANGE IN ACCORDANCE WITH CM193649 PER TDRR 06151		17 JAN 64 2-4-64	GG WR
F		CHANGED IN ACCORDANCE WITH 195864		12 MAR 64	RK EF
G		CHANGE IN ACCORDANCE WITH CM 196725 CX392	—	17 APRIL 64	JB



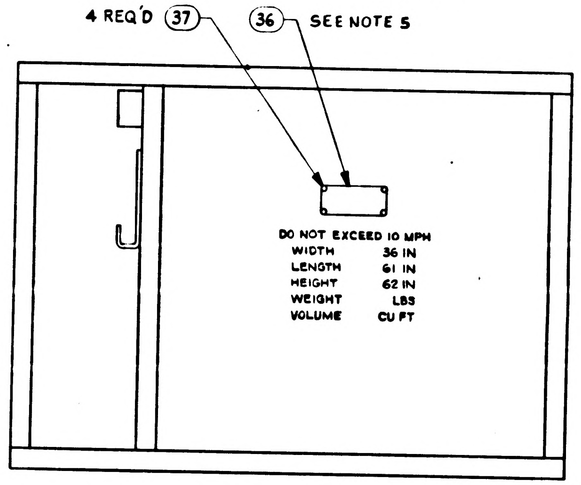
8
7
22
16 REQD
15
14
4 REQD

PARTIAL VIEW B-B
1:2 SCALE



B
B
11
9
43 4 REQD

VIEW A-A
COVER REMOVED
⑩ REMOVED
⑨ & ⑪ MOUNTED

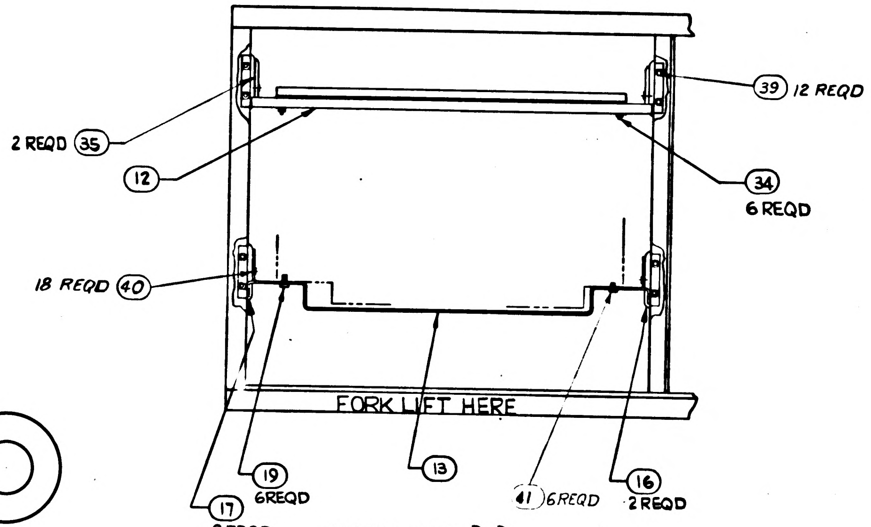


4 REQ'D 37
36 SEE NOTE 5
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT LBS
VOLUME CU FT

VIEW C-C

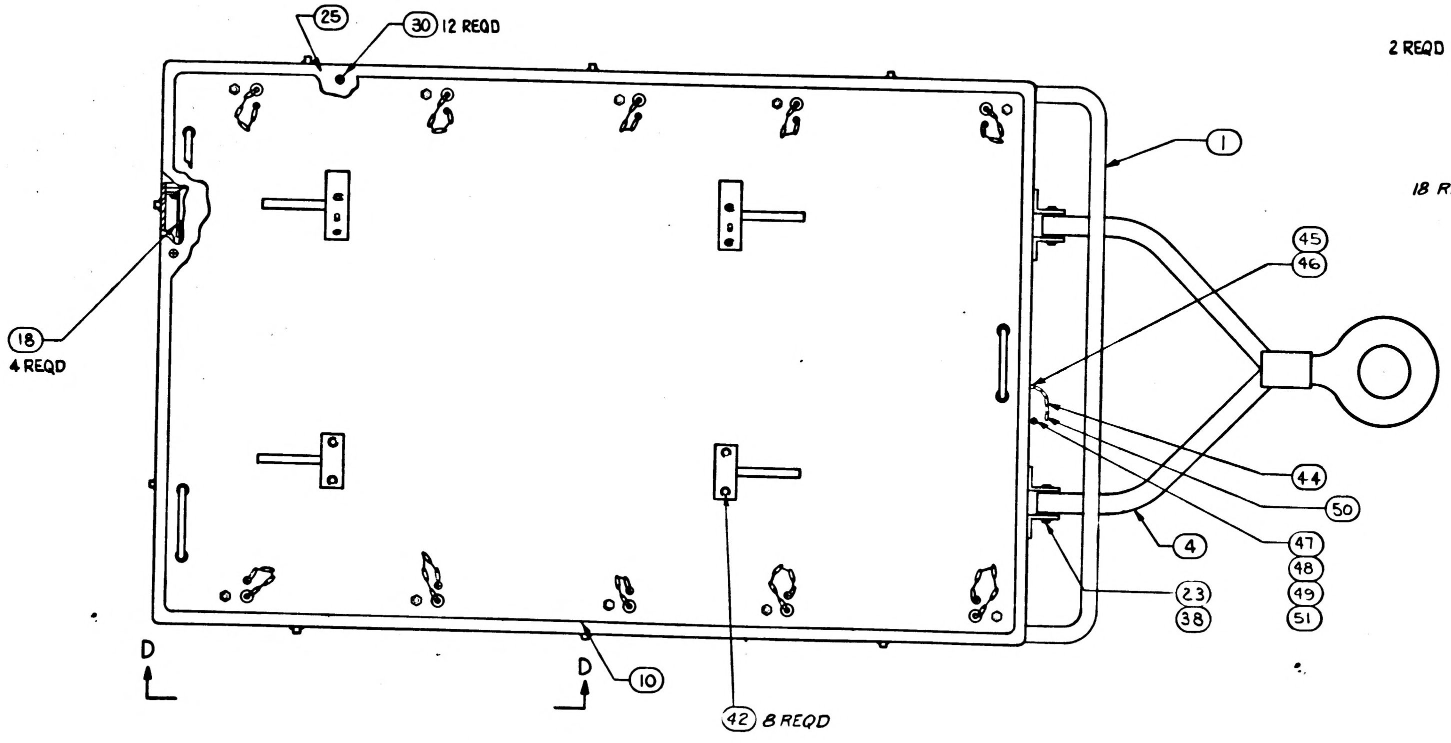
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. [illegible] DATE 8/21/63



39 12 REQD
2 REQD 35
12
34
6 REQD
18 REQD 40
FORK LIFT HERE
19
6REQD
17
2 REQD
13
41 6REQD
16
2 REQD

PARTIAL VIEW D-D
DOOR REMOVED



25
30 12 REQD
1
18
4 REQD
45
46
44
50
4
47
48
49
51
23
38
D
D
10
42 8 REQD

VIEW A-A
COVER REMOVED
⑩ MOUNTED ON TOP PLATE

Ⓓ THIS SHEET ADDED

1900030-011	1900030-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Summerville DATE 9 Aug 63
CHECKED Wilson 27 Nov 63
APPROVAL Winberg 27 Nov 63
APPROVAL 4/3/64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO
SIZE E
1900009
SCALE 1:4
SHEET 2 OF 2

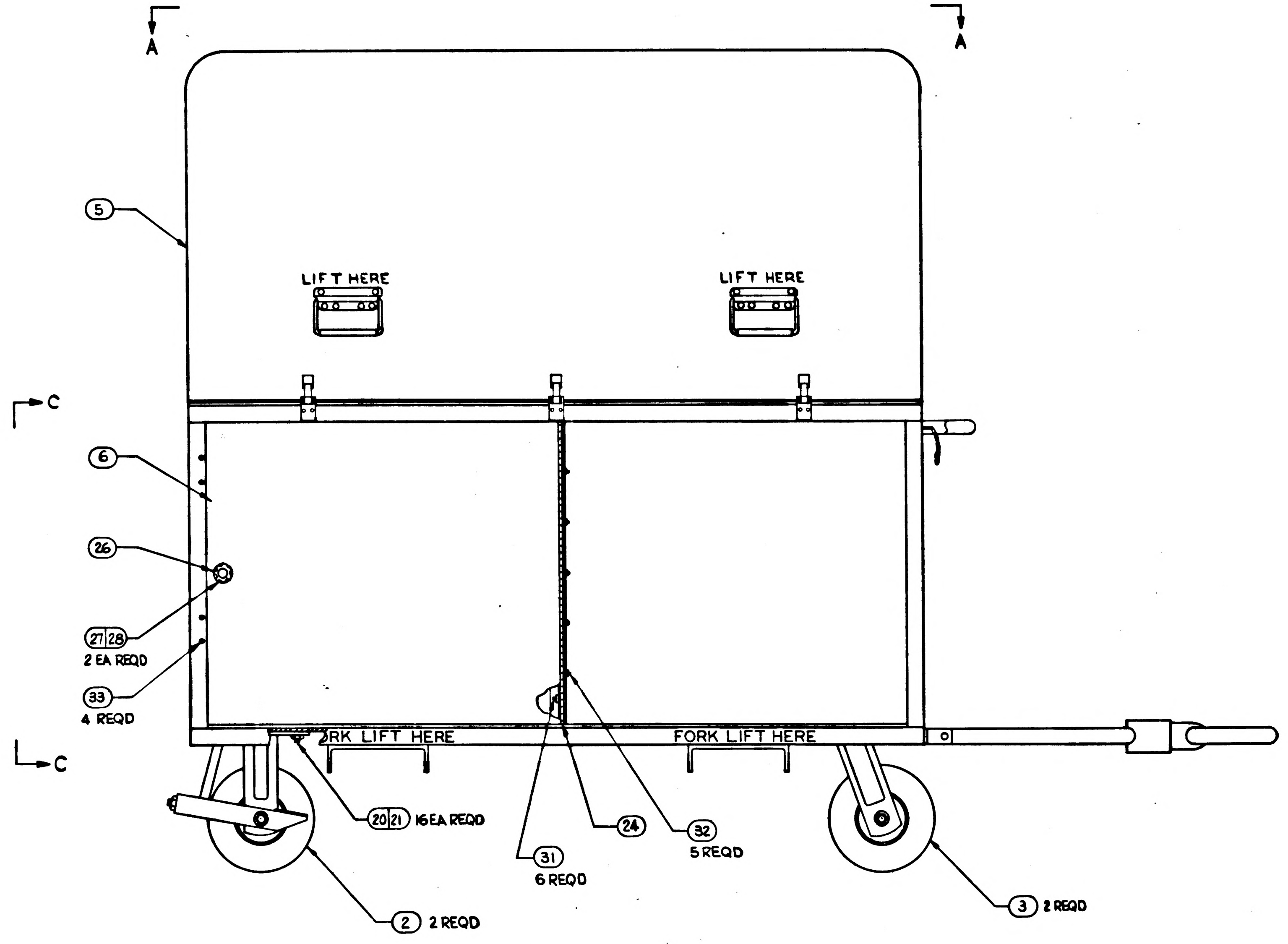
1900009 E

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS (18) & (33) ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM (36) IN ACCORDANCE WITH ND1002023. LETTERS AND NUMBERS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM (44) TO ITEM (49) SECURELY.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D	—	REPLACES REV "C" WITH CHANGE PER CM-192910 CHANGE NO OF SHEETS FROM 1 TO 2 REVISION STATUS ADDED	—	12-DEC 63	M.G.
Ⓜ E		CHANGE IN ACCORDANCE WITH CM 193649 PER TDRR 06151		17 3-6-64	GG
F		CHANGE IN ACCORDANCE WITH CM 195864		12 MAR 64	RR
G		CHANGE IN ACCORDANCE WITH CM 196725 REVISED CUSTOMER DATA REV PER TDRR 08392 V2-64	—	17 APR 64	CB
H	—	CHANGE IN ACCORDANCE WITH CM 197096 REVISED PER TDRR 08323	—	14 MAY 64	C.H. GG



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 DATE 8/21/63

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		52	1901641	BRACKET U-SHAPED
				2		51	MS 35338-81	WASHER, LOCK
				4		50	AN 960 C10	(1897006-017) WASHER, FLAT
				1		49	1016336-001	SNAP-SWIVEL
				4		48	AN 345 C10	(1897146-110) NUT, PLAIN HEX
SEE NOTE 4				~~1~~		~~47~~	~~1015918-001~~	~~EYE BOLT~~
				1		46	AN960-C4L	WASHER, FLAT (1897006-034)
SEE NOTE 4				1		45	1006783-20	SCREW, BUTTON HEAD
SEE NOTE 4 & 6				1		44	1016067-12	CHAIN, SAFETY
				4		43	MS 35217-071	SCREW-MACH PAN HEAD
				8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4				6		41	1006783-62	SCREW-BUTTON HEAD
SEE NOTE 4				18		40	1015826-304	SCREW-FLAT HEAD
SEE NOTE 4				12		39	1015826-300	SCREW-FLAT HEAD
				4		38	MS16624-4050	RING, RETAINING
				4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
				1		36	1901304-206	NAMEPLATE
				2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4				6		34	1015831-193	SCREW-FLAT HEAD
SEE NOTES 3 & 4				4		33	1015826-324	SCREW-FLAT HEAD
				5		32	MS35223-6	SCREW-PAN HEAD
				6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4				12		30	1015826-304	SCREW-FLAT HEAD
				1		29	1900708	WIRE LIST A-A
SEE NOTE 4				2		28	1015831-245	SCREW-FLAT HEAD
				2		27	MS20365-332A	NUT-SELF LOCKING
SEE NOTE 4				1		26	1016099-001	LATCH-DOOR
				1		25	1900711	TOP PLATE
				1		24	1900709	CONTINUOUS HINGE
				2		23	1900904	PIN, TOE BAR
				16		22	MS35217-52	SCREW-PAN HD
				16		21	MS20365-820C	NUT-SELF LOCKING
SEE NOTE 4				16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4				6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3				4		18	1900599	BRACKET, ANGLE
SEE NOTE 4				2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4				2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4				1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4				4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
				1		13	1900605	AGC MOUNTING BRACKET
				1		12	1900952-011	PSA MOUNTING BRACKET ASSY
				1		11	1900758-011	NAV. BASE OPTICS MTG PANEL
				1		10	1900688-011	D&C MTG PANEL ASSY
				1		9	1900687	IMU MTG PANEL ASSY
				1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
				1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
				1		6	1900596	DOOR, EQUIPMENT
				1		5	1900595	COVER (INSEP ASSY)
				1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4				2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4				2		2	1016070-008	CASTER, RIGID W/BRAKE
				1		1	1900593	TRANSPORTATION CART (INSEP ASSY)

LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
H	H
G	G
F	F
E	E
D	D

REVISION STATUS OF SHEETS

Ⓓ REPLACES REV C WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

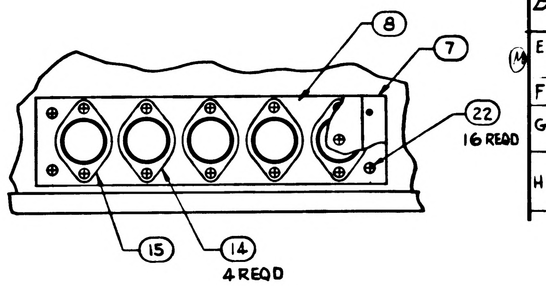
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DATE 19 MAR 63
CHECKED Wilson 27 NOV 63
APPROVAL Winberg 27 Nov 63
APPROVAL Gilman 2/5/64
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

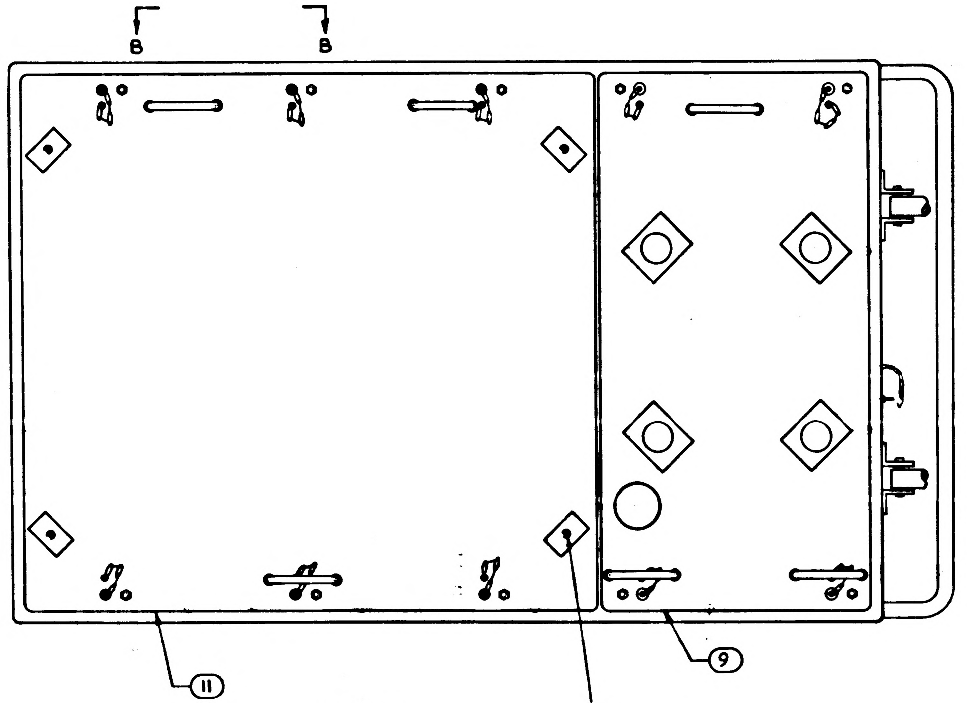
TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO.
SIZE E
1900009
SCALE 1/4
SHEET 1 OF 2

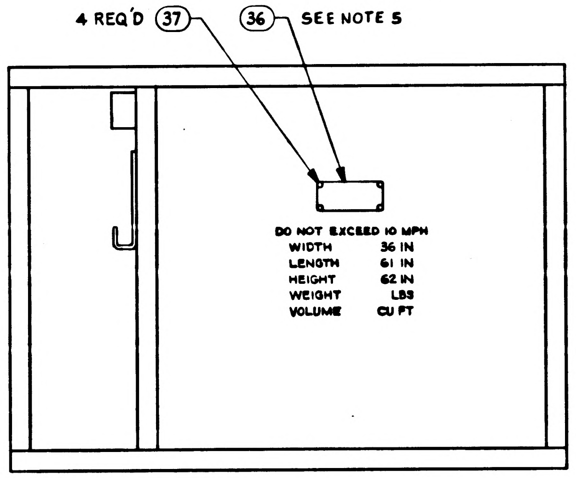
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER CM-192910		12-DEC-63	M.G.
E		CHANGE IN ACCORDANCE WITH CM193649 PER TDRR 06151		17 JAN 64	GG WR
F		CHANGED IN ACCORDANCE WITH 195864		12 MAR 64	RK
G		CHANGE IN ACCORDANCE WITH CM 196725 REV PER TDRR 07392	—	17 APRIL 64	B
H		CHANGED IN ACCORDANCE WITH CM 197096 REVISED PER TDRR 08393	—	14 MAY 64	C.Y. GG


8
7
22
16 REQD
15
14
4 REQD

PARTIAL VIEW B-B
1:2 SCALE


B
B
11
9
43 4 REQD

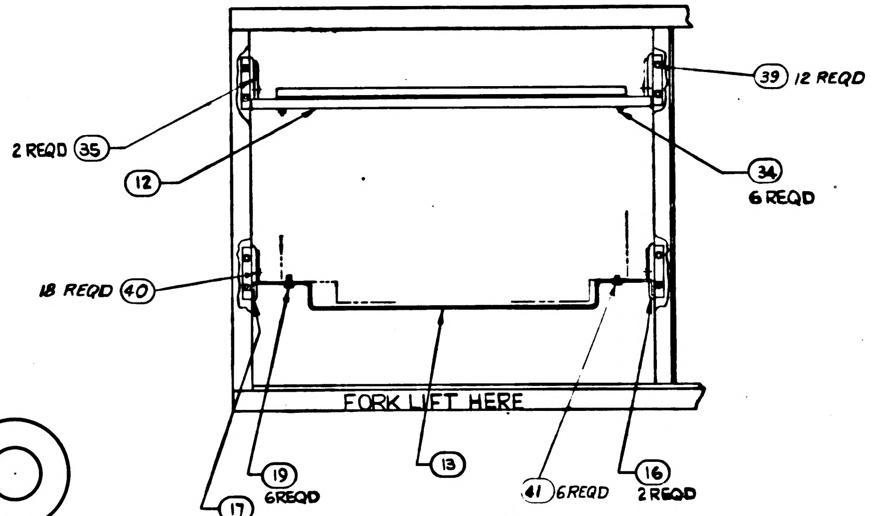
VIEW A-A
COVER REMOVED
(10) REMOVED
(9) & (11) MOUNTED


4 REQ'D 37
36 SEE NOTE 5
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT LBS
VOLUME CU FT

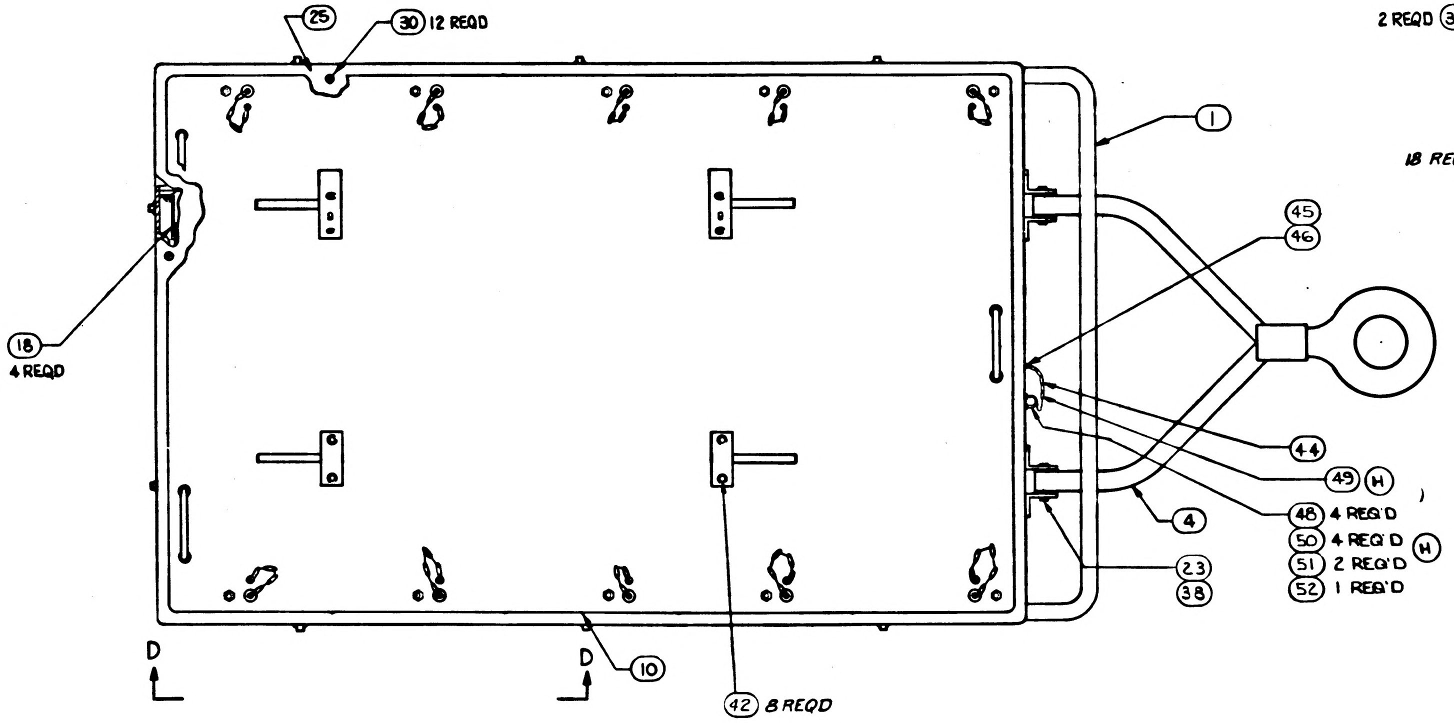
VIEW C-C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 DATE 8/21/63


39 12 REQD
2 REQD 35
12
34
6 REQD
18 REQD 40
FORK LIFT HERE
19
6 REQD
13
41 6 REQD
16
2 REQD
17
2 REQD

PARTIAL VIEW D-D
DOOR REMOVED


25
30 12 REQD
1
18
4 REQD
45
46
44
49 (H)
4
48 4 REQ'D
50 4 REQ'D (H)
51 2 REQ'D
52 1 REQ'D
23
38
D
D
10
42 8 REQD

VIEW A-A
COVER REMOVED
(10) MOUNTED ON TOP PLATE

(D) THIS SHEET ADDED

1900030-011	1900030-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Summerville DATE 9 Nov 63
CHECKED C Wilson 27 Nov 63
APPROVAL W. nberg 27 Nov 63
APPROVAL 1/3/64
NASA APPROVAL
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

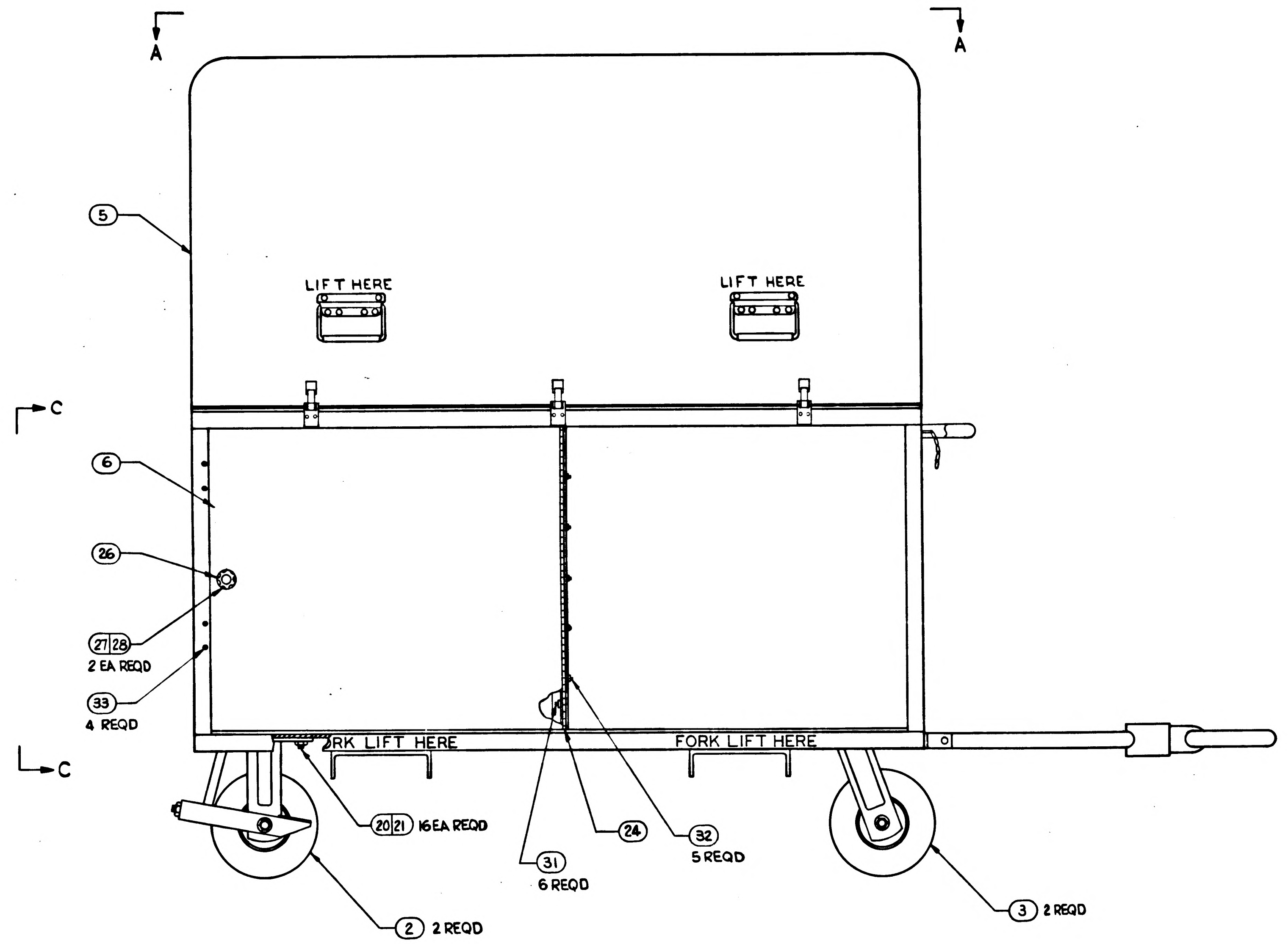
CODE IDENT NO.
SIZE E
1900009
SCALE 1:4
SHEET 2 OF 2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS (18) & (33) ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM 36 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMBERS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM (44) TO ITEM (49) SECURELY.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D	—	REPLACES REV "C" WITH CHANGE PER CM-192910 CHANGE NO OF SHEETS FROM 1 TO 2 REVISION STATUS ADDED	—	12-DEC-63	M.G
Ⓜ E		CHANGE IN ACCORDANCE WITH CM 193649 PER TDRR 06151		17	GG
F		CHANGE IN ACCORDANCE WITH CM 195864		12 MAR 64	RR
G		CHANGE IN ACCORDANCE WITH CM 196725 REVISED CUSTOMER DATA REV PER TDRR 08392 V2-64	—	7 APR 64	CB
Ⓜ H	—	CHANGE IN ACCORDANCE WITH CM 197096 REVISED PER TDRR 08393	—	14 MAY 64	CJ GG
J		REPLACED WITH CHANGE BY REV. K REVISED PER TDRR 07200	—	5 FEB 65	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02663 **DATE** 8/21/63

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1		52	1901641	BRACKET, U-SHAPED
				2		51	MS 35338-81	WASHER, LOCK
				4		50	AN 960 C10	(1897006-017) WASHER, FLAT
				1		49	1016336-001	SNAP - SWIVEL
				4		48	AN 345C10	(1897146-110) NUT, PLAIN HEX
SEE NOTE 4				~~1~~		~~47~~	~~1015916-001~~	~~EYE BOLT~~
				1		46	AN960-C4L	WASHER, FLAT (1897006-034)
SEE NOTE 4				1		45	1006783-20	SCREW, BUTTON HEAD
SEE NOTE 4 & 6				1		44	1016067-12	CHAIN, SAFETY
				4		43	MS 35217-071	SCREW-MACH PAN HEAD
				8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4				6		41	1006783-62	SCREW - BUTTON HEAD
SEE NOTE 4				18		40	1015826-304	SCREW - FLAT HEAD
SEE NOTE 4				12		39	1015826-300	SCREW - FLAT HEAD
				4		38	MS16624-4050	RING, RETAINING
				4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
				1		36	1901304-206	NAMEPLATE
				2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4				6		34	1015831-193	SCREW-FLAT HEAD
SEE NOTES 3&4				4		33	1015826-324	SCREW-FLAT HEAD
				5		32	MS35223-6	SCREW-PAN HEAD
				6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4				12		30	1015826-304	SCREW-FLAT HEAD
				1		29	1900708	WIRE LIST A-A
SEE NOTE 4				2		28	1015831-245	SCREW-FLAT HEAD
				2		27	MS20365-832A	NUT-SELF LOCKING
SEE NOTE 4				1		26	1016099-001	LATCH-DOOR
				1		25	1900711	TOP PLATE
				1		24	1900709	CONTINUOUS HINGE
				2		23	1900904	PIN, TOE BAR
				16		22	MS35217-52	SCREW-PAN HD
				16		21	MS20365-820C	NUT-SELF LOCKING
SEE NOTE 4				16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4				6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3				4		18	1900599	BRACKET, ANGLE
SEE NOTE 4				2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4				2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4				1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4				4		14	1015975-001	CONNECTOR-RECEPT. ELEC
				1		13	1900605	AGC MOUNTING BRACKET
				1		12	1900952-011	PSA MOUNTING BRACKET ASSY
				1		11	1900753-011	NAV. BASE OPTICS MTG PANEL
				1		10	1900688-011	D&C MTG PANEL ASSY
				1		9	1900687	IMU MTG PANEL ASSY
				1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
				1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
				1		6	1900596	DOOR, EQUIPMENT
				1		5	1900595	COVER (INSEP ASSY)
				1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4				2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4				2		2	1016070-008	CASTER, RIGID W/BRAKE
				1		1	1900593	TRANSPORTATION CART (INSEP ASSY)
QUANTITY REQUIRED								LIST OF PARTS AND MATERIALS

J	J
H	H
G	G
F	F
E	E
D	D
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓙ REPLACED WITH CHANGE BY REV K
Ⓓ REPLACES REV C WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Summerville DATE 19 MAR 63
CHECKED W Mason 27 NOV 63
APPROVAL Winberg 27 Nov 63
APPROVAL 2/3/64
NASA APPROVAL
MIT APPROVAL

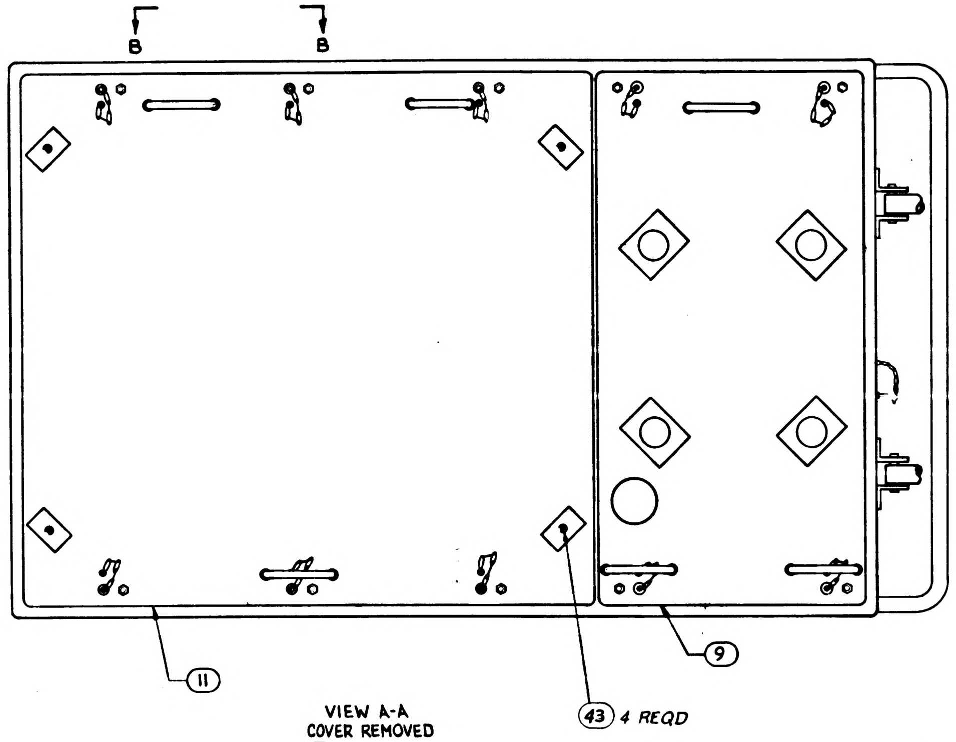
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

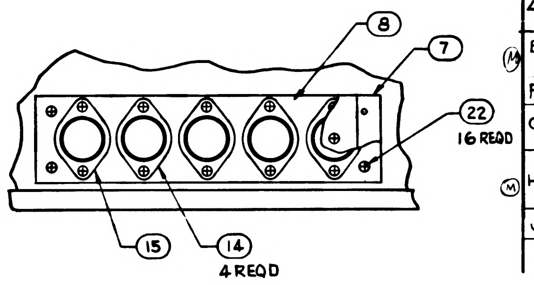
CODE IDENT NO.
SIZE E
1900009
SCALE 1/4
SHEET 1 OF 2

1900009

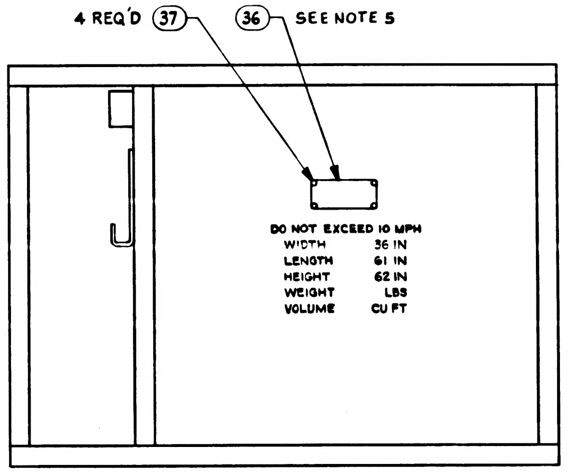
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER CM-192910		12-DEC-63	M.G.
E		CHANGE IN ACCORDANCE WITH CM193649 PER TDRR 06151		17 JAN 64	GG WK
F		CHANGED IN ACCORDANCE WITH 195864		12 MAR 64	RK
G		CHANGE IN ACCORDANCE WITH CM 196725 REV PER TDRR 08392	—	17 APRIL 64	JB
H		CHANGED IN ACCORDANCE WITH CM 197096 REVISED PER TDRR 08392	—	14 MAY 64	GG
J		REPLACED WITH CHANGE BY REV K REVISED PER TDRR 7200	—	5 FEB 65	


B
B
11
43 4 REQD
9

VIEW A-A
COVER REMOVED
(10) REMOVED
(9) & (11) MOUNTED


8
7
22
16 REQD
15
14
4 REQD

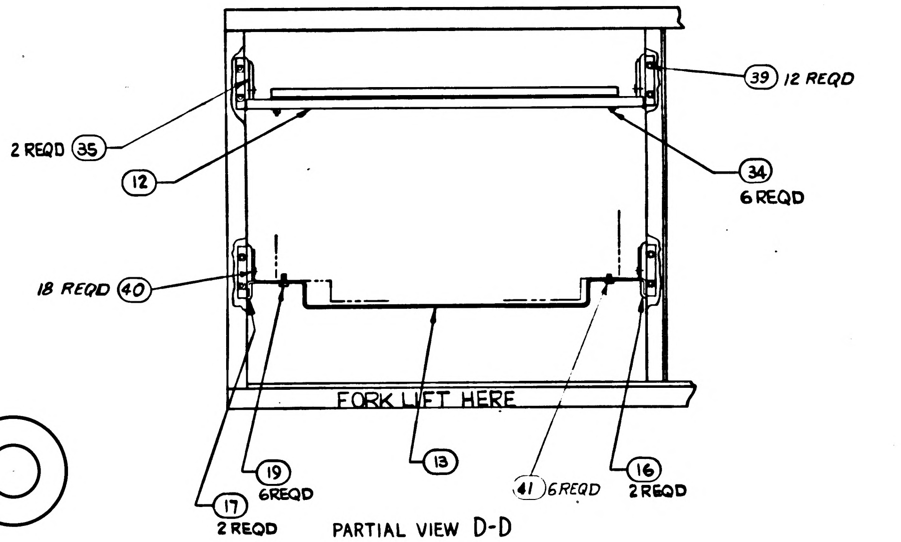
PARTIAL VIEW B-B
1:2 SCALE


4 REQ'D 37
36 SEE NOTE 5
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT LBS
VOLUME CU FT

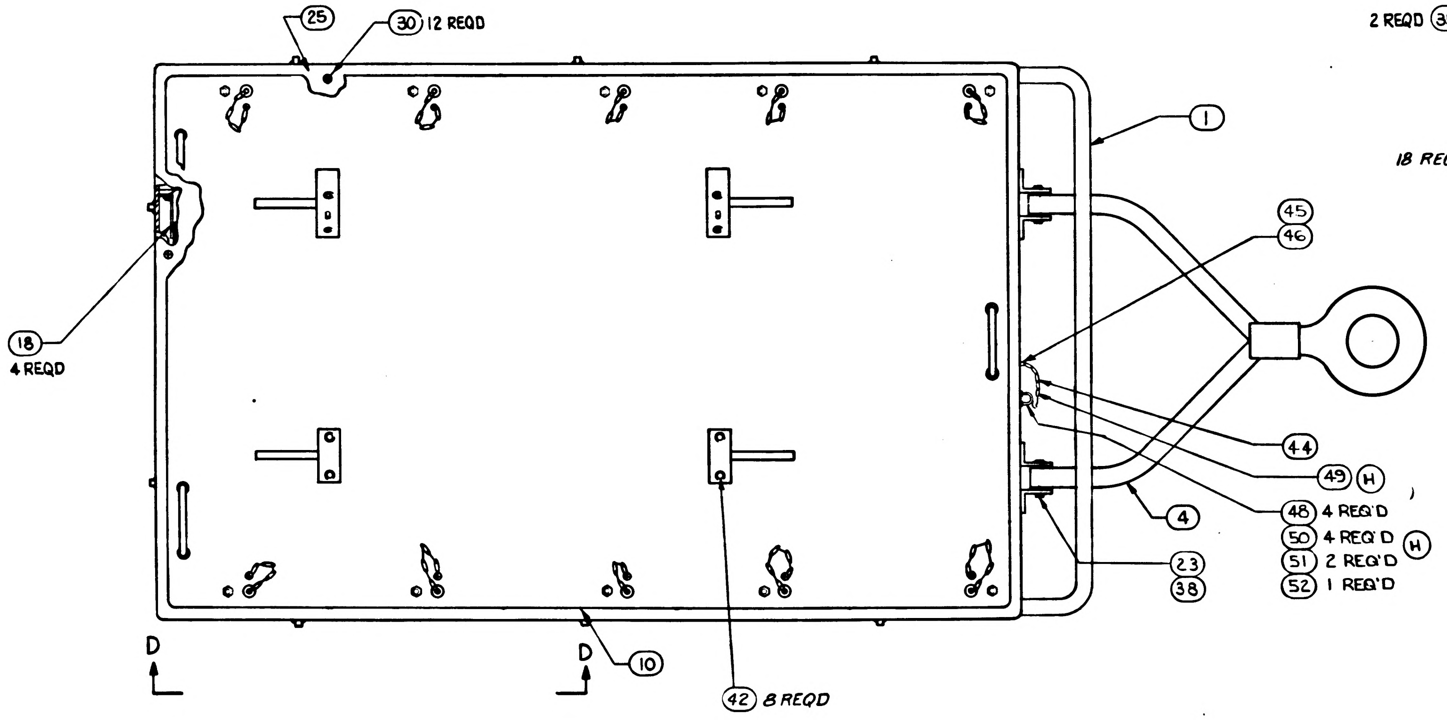
VIEW C-C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ______ DATE 8/21/63


39 12 REQD
2 REQD 35
12
34
6 REQD
18 REQD 40
FORK LIFT HERE
19
6REQD
17
2 REQD
13
41 6REQD
16
2 REQD

PARTIAL VIEW D-D
DOOR REMOVED


25
30 12 REQD
1
45
46
18
4 REQD
44
49 (H)
4
48 4 REQ'D
50 4 REQ'D (H)
51 2 REQ'D
52 1 REQ'D
23
38
D
D
10
42 8 REQD

VIEW A-A
COVER REMOVED
(10) MOUNTED ON TOP PLATE

Ⓙ REPLACED WITH CHANGE BY REV K
Ⓓ THIS SHEET ADDED

1900030-011	1900030-011	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Summerville DATE 9 Nov 63
CHECKED Wilson 27 Nov 63
APPROVAL Wingerg 27 Nov 63
APPROVAL Gitimen 1/3/64
NASA APPROVAL 2/10/64
MIT APPROVAL 4 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

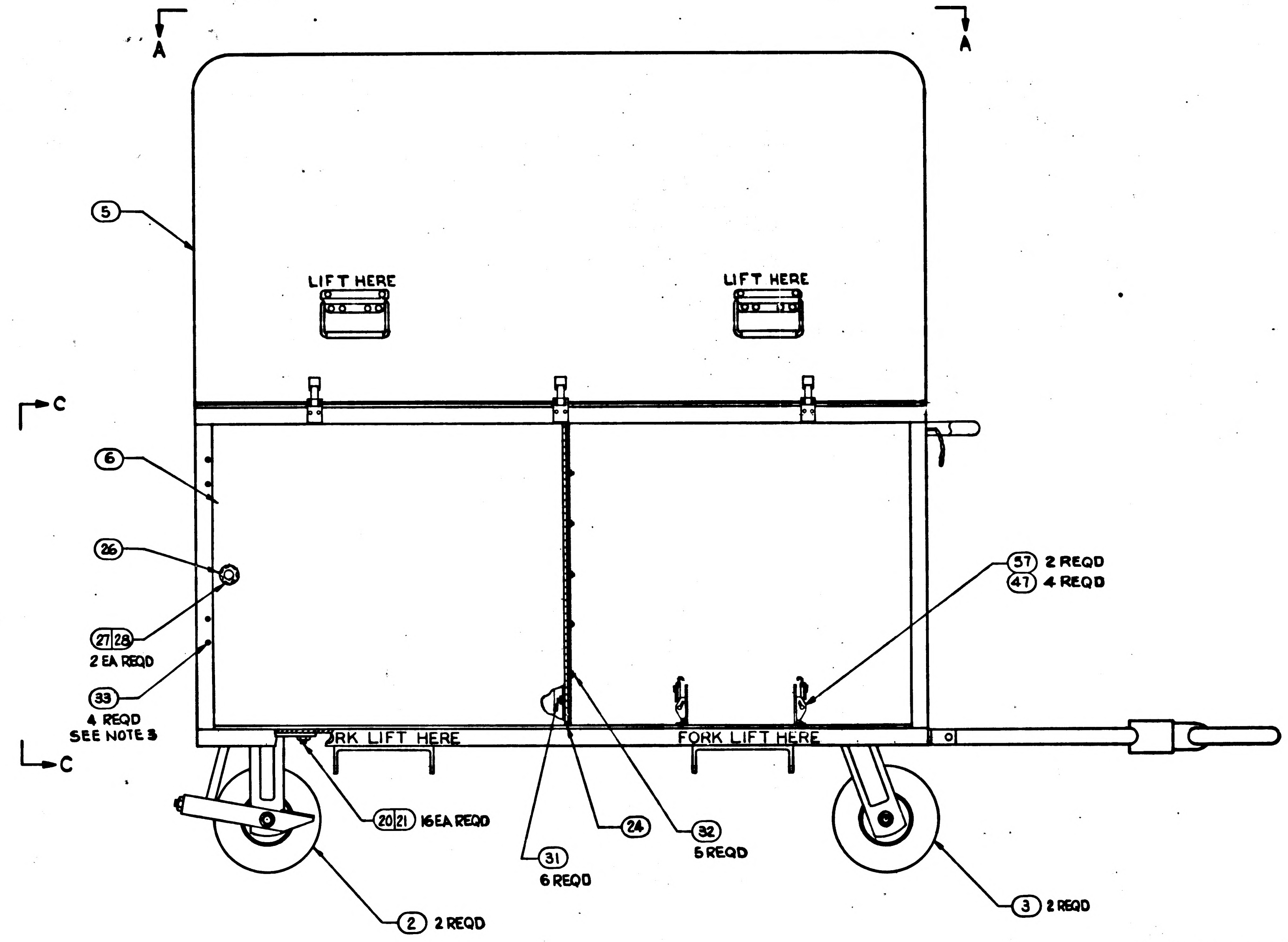
CODE IDENT NO.
SIZE E
1900009
SCALE 1:4
SHEET 2 OF 2

1900009

REVISIONS ~~TDRR~~ 02555					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K	B-4	REPLACES REV. J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR 7200		5 FEB 65	JWP / CU

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS (18)(30)(33) ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM (36) OR ITEM (40) IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM (44) TO ITEM (49) SECURELY.
7. STENCILING OMITTED ON ITEMS (53)(54)(55).



K	K	K	K
SHEET 1	SHEET 2	SHEET 3	SHEET 4

REVISION STATUS OF SHEETS

(K) REPLACES REV J WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2	—		57	1901923	FASTENER POS. LOCK (INSEP ASSY)
			1	—		56	1901850-011	PLATE AND CLAMP ASSY
			1	—		55	1902070-011	PLATE ASSY, D&C COMPONENTS
			1	—		54	1902066-011	PLATE ASSY, DSKY & ELEC COMP
			1	—		53	1902073-011	SHELF ASSY, AGC COMPONENTS
			1	1		52	1901641	BRACKET, U-SHAPED
			2	2		51	MS 35338-81	WASHER, LOCK
			4	4		50	AN 960 C10	(1897006-017) WASHER, FLAT
			1	1		49	[illegible]	[illegible]
			4	4		48	AN 345C10	(1897146-110) NUT, PLAIN HEX
			4	—		47	MS 35216-43	SCREW, MACH PAN HEAD
			1	1		46	AN960-C8L	WASHER, FLAT (1897006-034)
SEE NOTE 4			1	1		45	1006783-20	SCREW, BUTTON HEAD
SEE NOTE 4 & 6			1	1		44	1016067-12	CHAIN, SAFETY
			—	4		43	MS 35217-071	SCREW-MACH PAN HEAD
			—	8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4			—	6		41	1006783-62	SCREW-BUTTON HEAD
			1	—		40	1901304-237	NAME PLATE
SEE NOTE 4			12	12		39	1015826-300	SCREW-FLAT HEAD
			4	4		38	MS16624-4050	RING, RETAINING
			4	4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
			—	1		36	1901304-206	NAMEPLATE
			2	2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4			6	6		34	1013831-193	SCREW-FLAT HEAD
SEE NOTES 3&4			4	4		33	1015826-824	SCREW-FLAT HEAD
			5	5		32	MS35223-6	SCREW-PAN HEAD
			6	6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4			30	30		30	1015826-304	SCREW-FLAT HEAD
			1	1		29	1900708	WIRE LIST A-A
SEE NOTE 4			2	2		28	1013831-245	SCREW-FLAT HEAD
			2	2		27	MS20365-832A	NUT-SELF LOCKING
SEE NOTE 4			1	1		26	1016099-001	LATCH-DOOR
			1	1		25	1900711	TOP PLATE
			1	1		24	1900709	CONTINUOUS HINGE
			2	2		23	1900904	PIN, TOE BAR
			16	16		22	MS35217-52	SCREW-PAN HD
			16	16		21	MS20365-820C	NUT-SELF LOCKING
SEE NOTE 4			16	16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4			—	6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3			4	4		18	1900599	BRACKET, ANGLE
SEE NOTE 4			2	2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4			2	2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4			1	1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4			4	4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
			—	1		13	1900605	AGC MOUNTING BRACKET
			1	1		12	1900952-011	PSA MOUNTING BRACKET ASSY
			—	1		11	1900788-011	NAV BASE OPTICS MTG. PANEL
			—	1		10	1900688-011	D&C MTG PANEL ASSY
			1	1		9	1900687-011	IMU MTG PANEL ASSY
			1	1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
			1	1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
			1	1		6	1900596	DOOR EQUIPMENT
			1	1		5	1900595	COVER (INSEP ASSY)
			1	1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4			2	2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4			2	2		2	1016070-008	CASTER, RIGID W/BRAKE
			1	1		1	1900593	TRANSPORTATION CART (INSEP ASSY)

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-021

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN H. Lisa DATE 22 DEC 64
CHECKED C. Pioda 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL J. Goldman 3/4/65
NASA APPROVAL W. J. Rhine 3-9-65
MIT APPROVAL McKinley

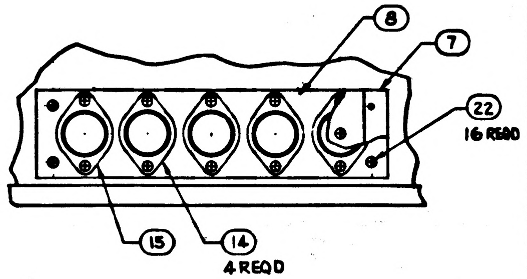
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N ASSEMBLY

CODE IDENT NO. SIZE E 1900009
SCALE 1:4 SHEET 1 OF 4

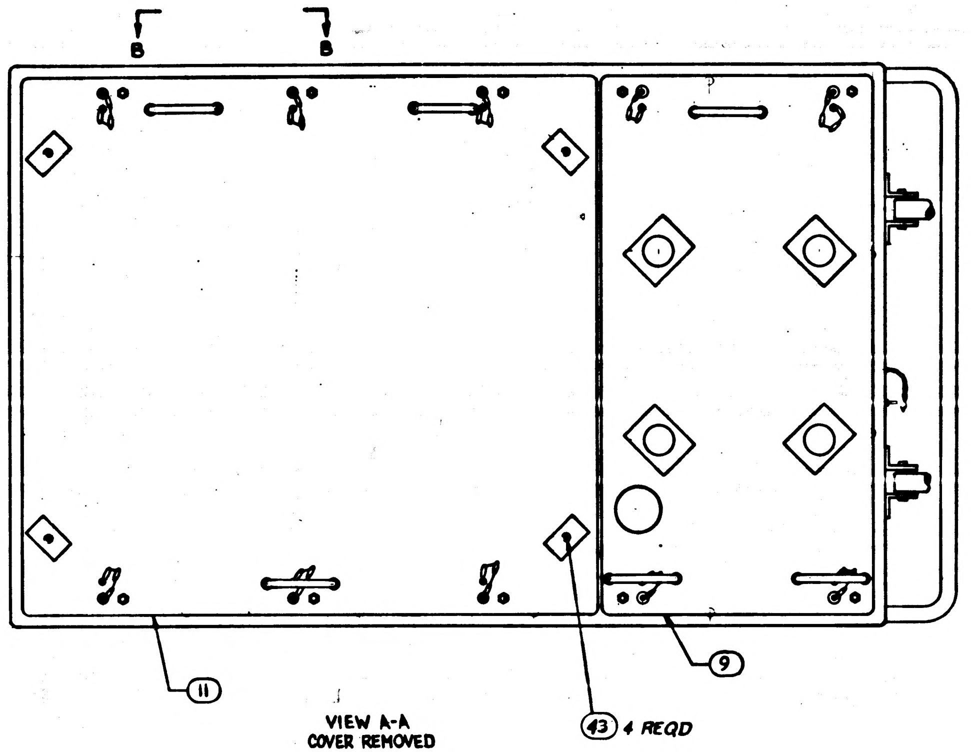
1900009

REVISIONS TDRR 02663				
SYM	ZONE	DESCRIPTION	DATE	APPD.
K	B-2	REPLACES REV. J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR 17200	5 FEB 65	JWP



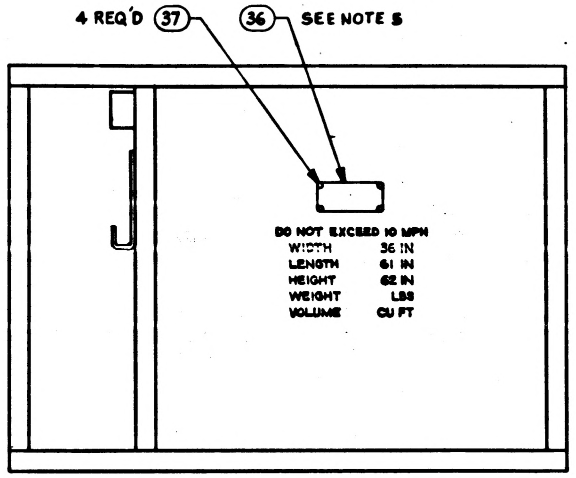
8
7
22
16 REQD
15
14
4 REQD

PARTIAL VIEW B-B
1:2 SCALE



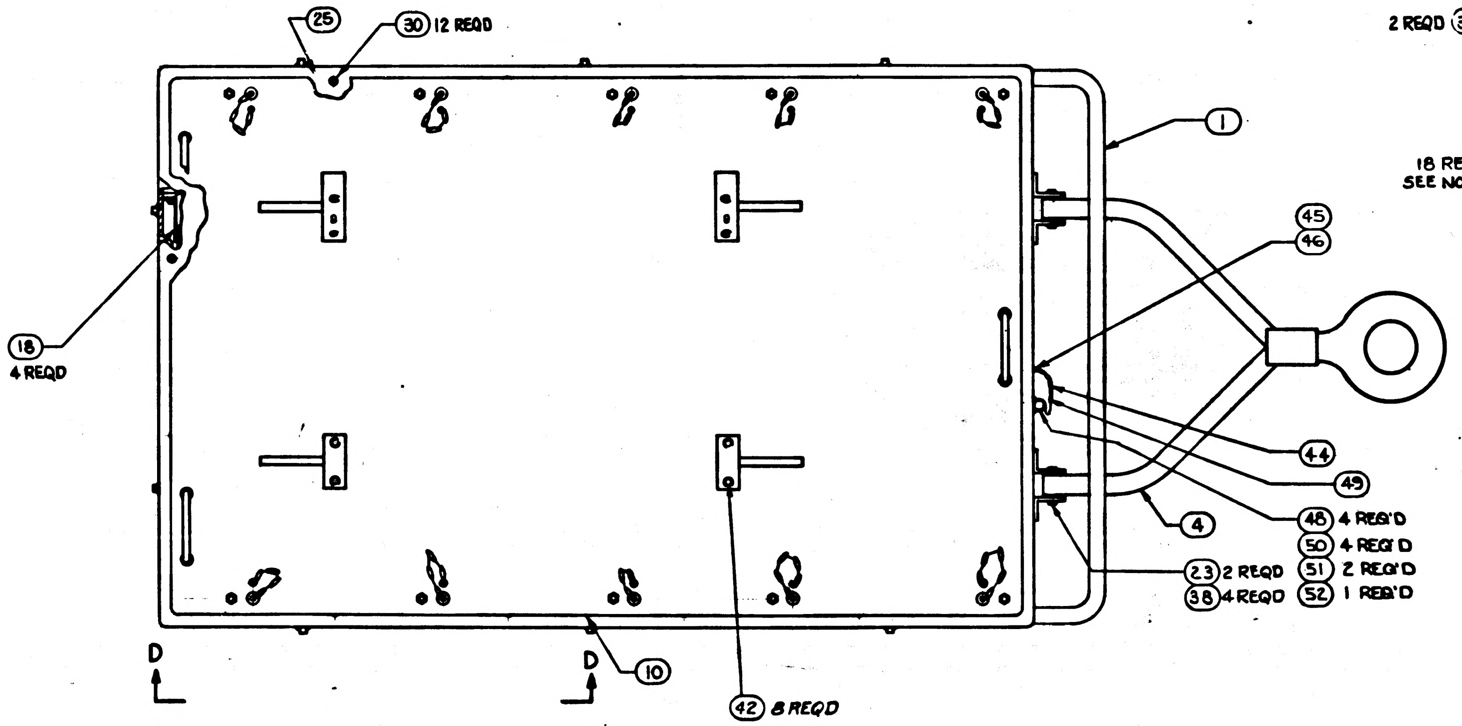
B
B
11
9
43 4 REQD

VIEW A-A
COVER REMOVED
(10) REMOVED
(9) & (11) MOUNTED



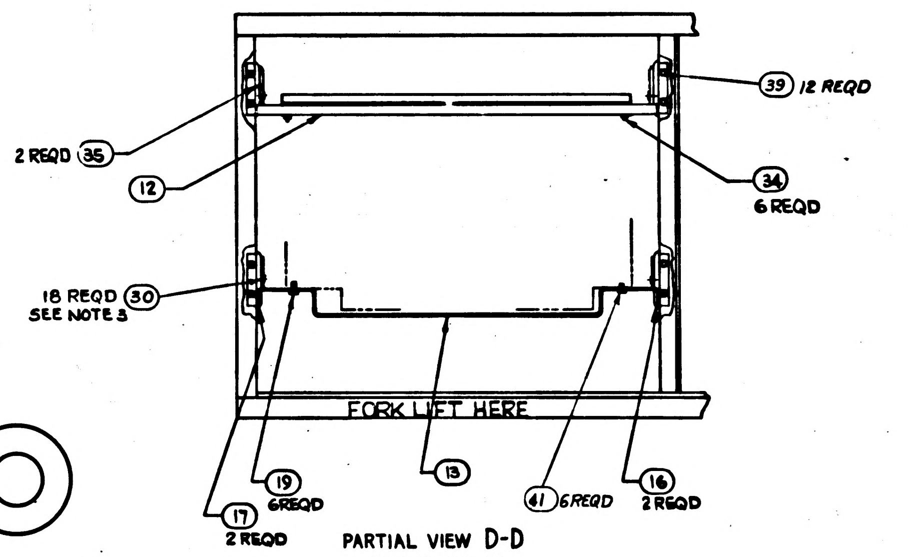
4 REQ'D 37
36 SEE NOTE 5
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT LBS
VOLUME CU FT

VIEW C-C



25
30 12 REQD
1
45
46
18
4 REQD
44
49
4
48 4 REQ'D
50 4 REQ'D
51 2 REQ'D
52 1 REQ'D
23 2 REQD
38 4 REQD
D
D
10
42 8 REQD

VIEW A-A
COVER REMOVED
(10) MOUNTED ON TOP PLATE



39 12 REQD
2 REQD 35
12
34
6 REQD
18 REQD 30
SEE NOTE 5
FORK LIFT HERE
19
6REQD
17
2 REQD
13
41 6 REQD
16 2 REQD

PARTIAL VIEW D-D
DOOR REMOVED

Ⓚ REPLACES REV J WITH CHANGE

1900030-011	1900030-011	-021
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

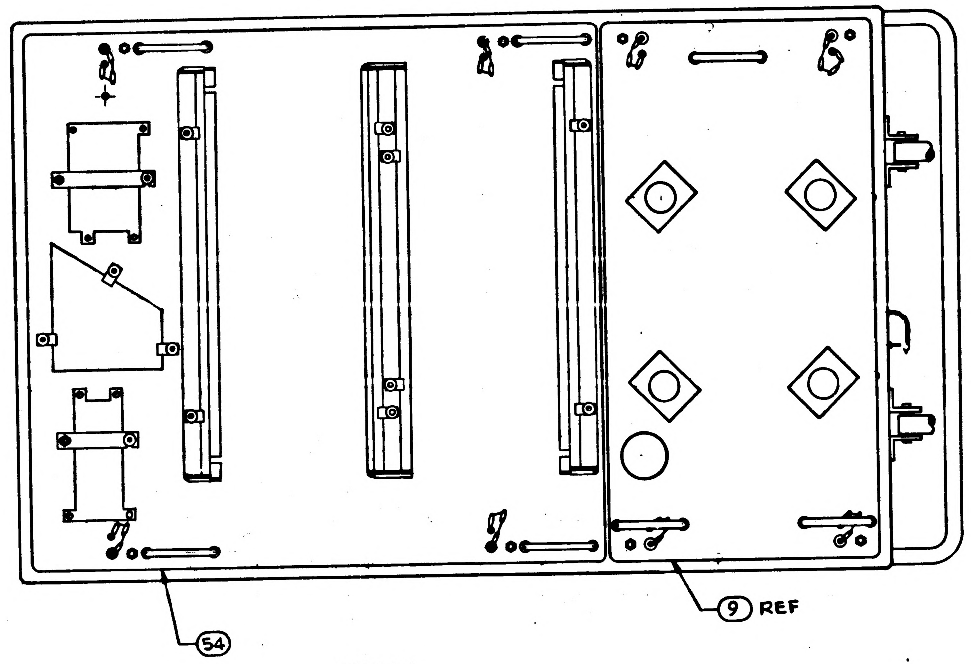
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 22 DEC 64 DATE
CHECKED C. Pojda 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL 3/5/65
NASA APPROVAL 3-9-65
MIT APPROVAL McMurdy

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

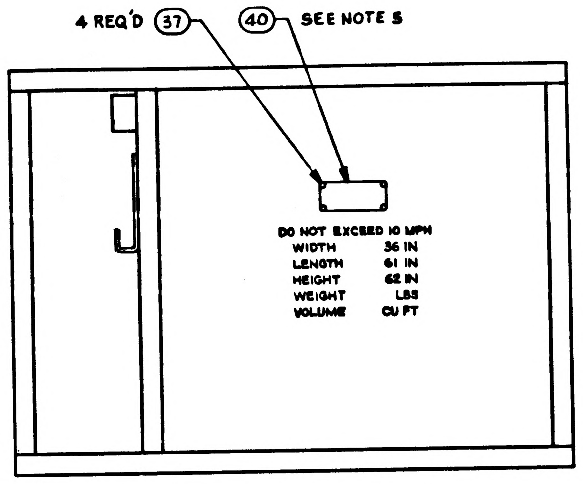
TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO.
SIZE E
1900009
SCALE 1:4
SHEET 2 OF 4

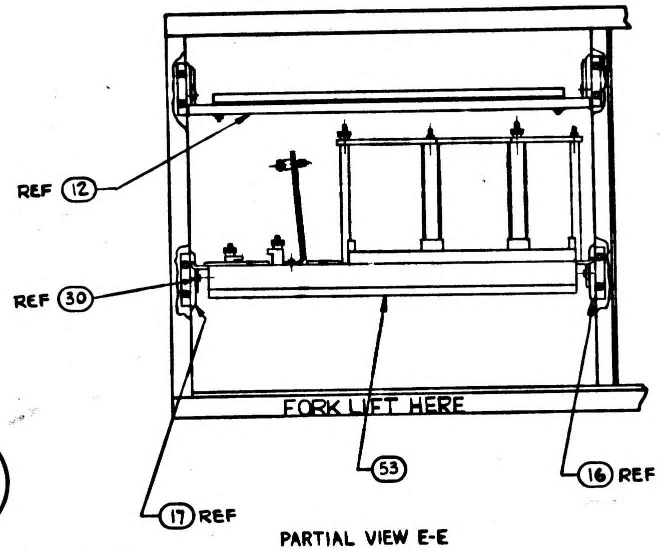
REVISIONS TDRR 32663				
SYM	ZONE	DESCRIPTION	DATE	APPD.
K		THIS SHEET ADDED PER TDRR 17200	5 FEB 65	JND



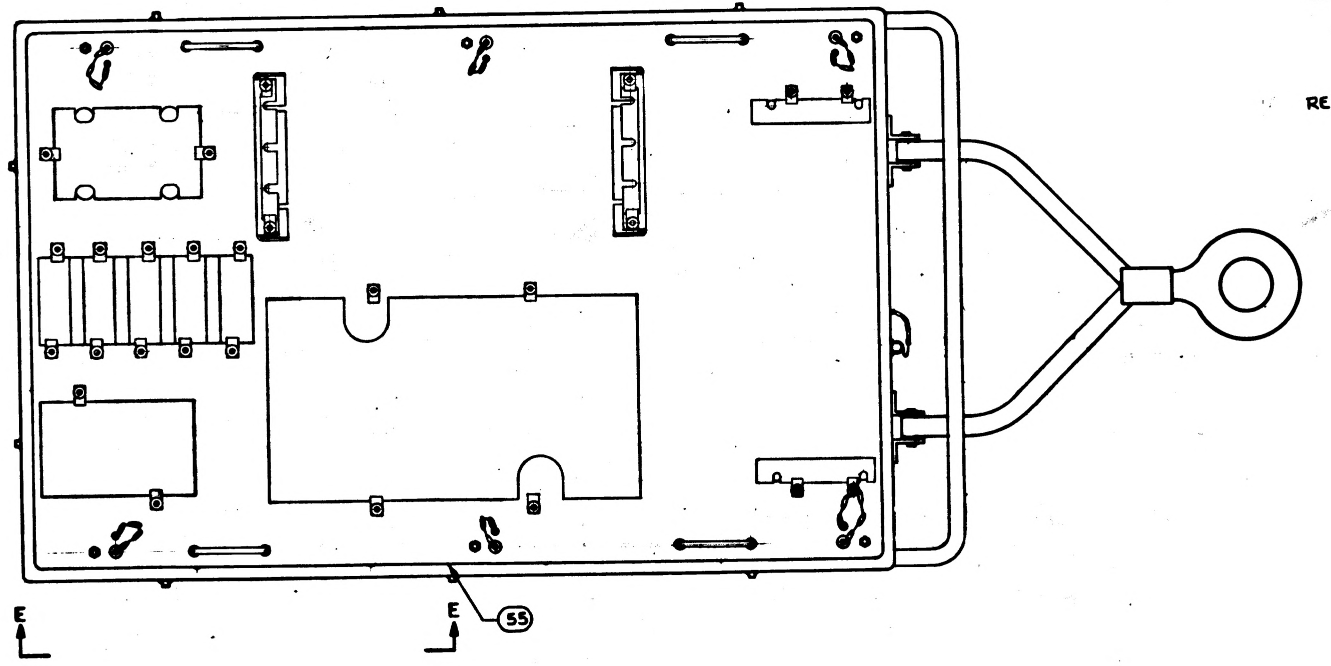
VIEW A-A
COVER REMOVED


4 REQ'D 37
40 SEE NOTE 5
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT LBS
VOLUME CU FT

VIEW C-C


REF 12
REF 30
FORK LIFT HERE
53
16 REF
17 REF

PARTIAL VIEW E-E
DOOR REMOVED



VIEW A-A
COVER REMOVED

Ⓚ THIS SHEET ADDED

1900050-011	1900020-011	-021
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 29 DEC 64
CHECKED C. Pryda 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL 3-2-65
NASA APPROVAL W. J. Rh
MIT APPROVAL McAlister

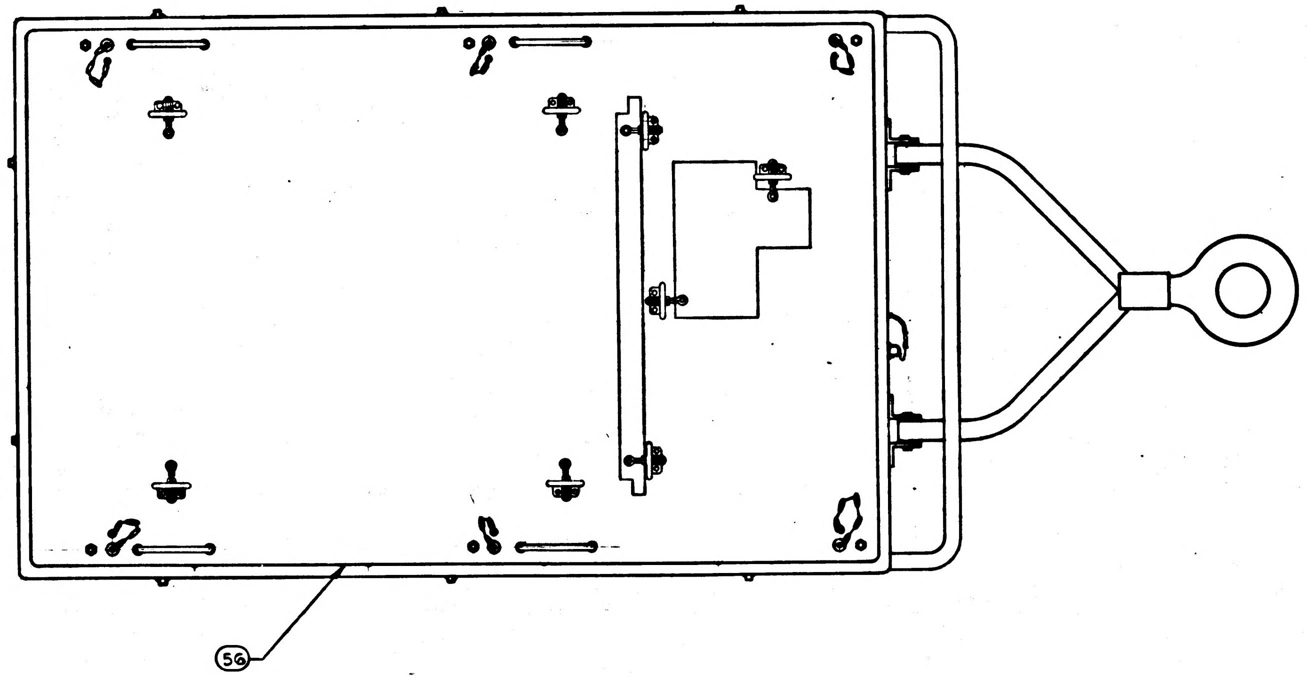
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO.
SIZE E
1900009
SCALE 1:4
SHEET 3 OF 4

1900009
K

REVISIONS TDRR 02663				
SYM	ZONE	DESCRIPTION	DATE	APPD.
K	B-2	THIS SHEET ADDED PER TDRR 17200	5 FEB 65	UNP



VIEW A-A
COVER REMOVED

Ⓚ THIS SHEET ADDED

1900030-011	1900030-011	-021
NEXT ASSY	USED ON	APPLICABLE DASH NO.
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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ___ ± ___ ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 22 DEC 64
CHECKED C. Pigde 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL 3 Feb 65
NASA APPROVAL 3-9-65
MIT APPROVAL M. G. Murley

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

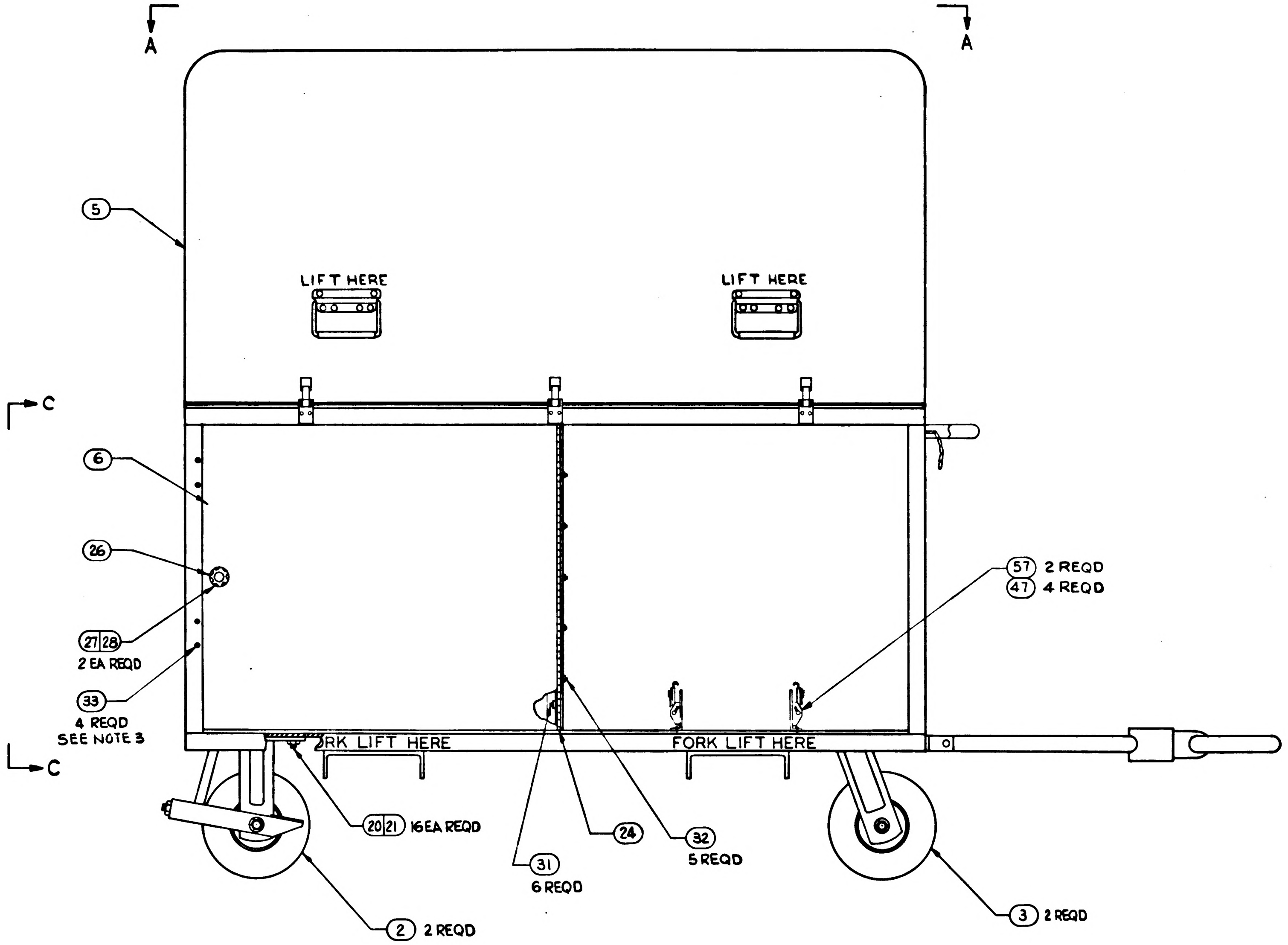
TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO.
SIZE E
1900009
SCALE 1:4
SHEET 4 OF 4

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K	B-4	REPLACES REV. J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR		FEB 65	
L	B-4	REVISED PER TDRR 8385	—	APR 65	

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS ⑱㉚㉝ ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM ㊱ OR ITEM ㊵ IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM ㊹ TO ITEM ㊾ SECURELY.
7. STENCILING OMITTED ON ITEMS (53)(54)(55).



L	K	K	L
SHEET 1	SHEET 2	SHEET 3	SHEET 4

REVISION STATUS OF SHEETS

Ⓚ REPLACES REV J WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
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			1	—		56	1901850-011	PLATE AND CLAMP ASSY
			1	—		55	1902070-011	PLATE ASSY, D&C COMPONENTS
			1	—		54	1902066-011	PLATE ASSY, DSKY & ELEC COMP
			1	—		53	1902073-011	SHELF ASSY, AGC COMPONENTS
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			4	4		50	AN 960 C10	(1897006-017) WASHER, FLAT
			1	1		49	1016336-001	SNAP - SWIVEL
			4	4		48	AN 345C10	(1897146-110) NUT, PLAIN HEX
			4	—		47	MS 35216-43	SCREW, MACH PAN HEAD
			1	1		46	AN960-C4L	WASHER, FLAT (1897006-034)
SEE NOTE 4			1	1		45	1006783-20	SCREW, BUTTON HEAD
SEE NOTE 4 & 6			1	1		44	1016067-12	CHAIN, SAFETY
			—	4		43	MS 35217-071	SCREW-MACH PAN HEAD
			—	8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4			—	6		41	1006783-62	SCREW - BUTTON HEAD
			1	—		40	1901304-237	NAME PLATE
SEE NOTE 4			12	12		39	1015826-300	SCREW - FLAT HEAD
			4	4		38	MS16624-4050	RING, RETAINING
			4	4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
			—	1		36	1901304-206	NAMEPLATE
			2	2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4			6	6		34	1015831-193	SCREW-FLAT HEAD
SEE NOTES 3&4			4	4		33	1015826-324	SCREW-FLAT HEAD
			5	5		32	MS35223-6	SCREW-PAN HEAD
			6	6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4			30	30		30	1015826-304	SCREW-FLAT HEAD
			1	1		29	1900708	WIRE LIST A-A
SEE NOTE 4			2	2		28	1016831-245	SCREW-FLAT HEAD
			2	2		27	MS20365-832A	NUT-SELF LOCKING
SEE NOTE 4			1	1		26	1016099-001	LATCH-DOOR
			1	1		25	1900711	TOP PLATE
			1	1		24	1900709	CONTINUOUS HINGE
			2	2		23	1900904	PIN, TOE BAR
			16	16		22	MS35217-52	SCREW-PAN HD
			16	16		21	MS20365-820 C	NUT-SELF LOCKING
SEE NOTE 4			16	16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4			—	6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3			4	4		18	1900599	BRACKET, ANGLE
SEE NOTE 4			2	2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4			2	2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4			1	1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4			4	4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
			—	1		13	1900605	AGC MOUNTING BRACKET
			1	1		12	1900952-011	PSA MOUNTING BRACKET ASSY
			—	1		11	1900753-011	NAV. BASE OPTICS MTG PANEL
			—	1		10	1900688-011	D&C MTG PANEL ASSY
			1	1		9	1900687-011	IMU MTG PANEL ASSY
			1	1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
			1	1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
			1	1		6	1900596	DOOR, EQUIPMENT
			1	1		5	1900595	COVER (INSEP ASSY)
			1	1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4			2	2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4			2	2		2	1016070-008	CASTER, RIGID W/BRAKE
			1	1		1	1900593	TRANSPORTATION CART (INSEP ASSY)

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-021

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PR
DRAWN H. Friede DATE 22 DEC 64
CHECKED C. Piazza 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL
MIT APPROVAL

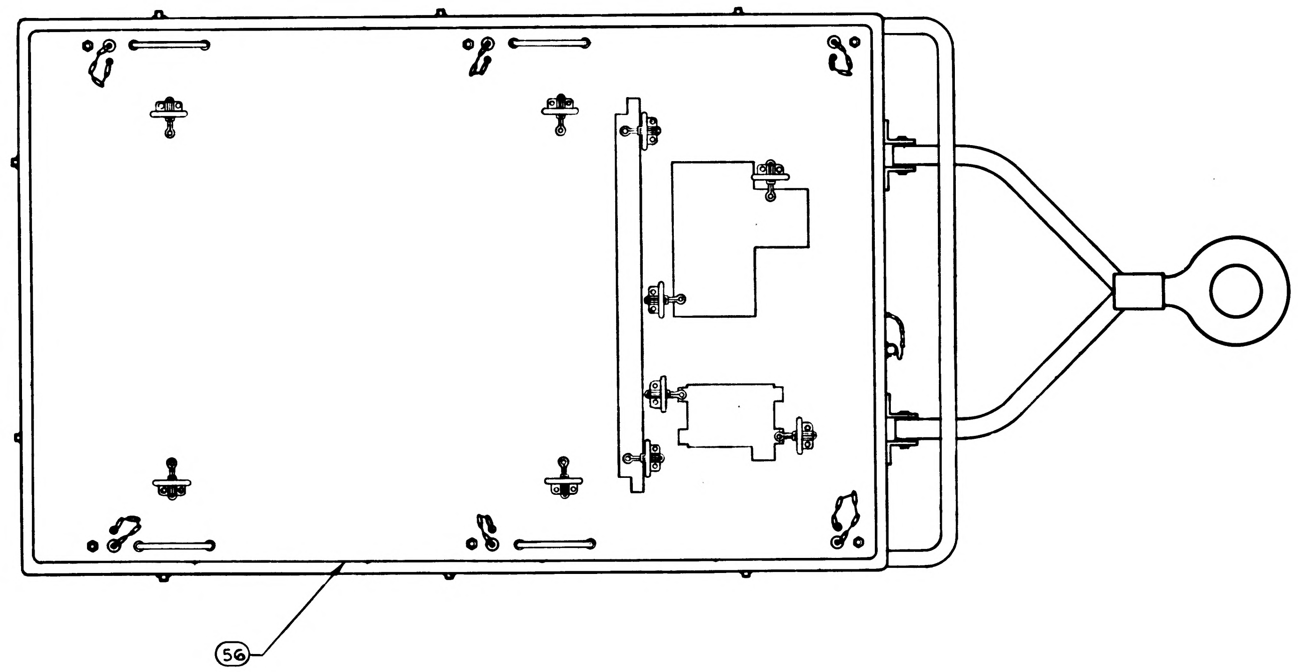
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N

ASSEMBLY

CODE IDENT NO 99974
SIZE E
1900009
SCALE 1:4
SHEET 1 OF 4

REVISIONS TDRR 02263				
SYM	ZONE	DESCRIPTION	DATE	APPD.
K	B-2	THIS SHEET ADDED PER TDRR 7200	5-3-65	JWP
L	C-5	REVISED PER TDRR 18385	27 APR 65	JWP



VIEW A-A
COVER REMOVED

Ⓚ THIS SHEET ADDED

1900030-011	1900030-011	-021
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN H. Fries DATE 22 DEC 64
CHECKED C. Pizzala 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL 3-9-65
MIT APPROVAL M. Morley

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

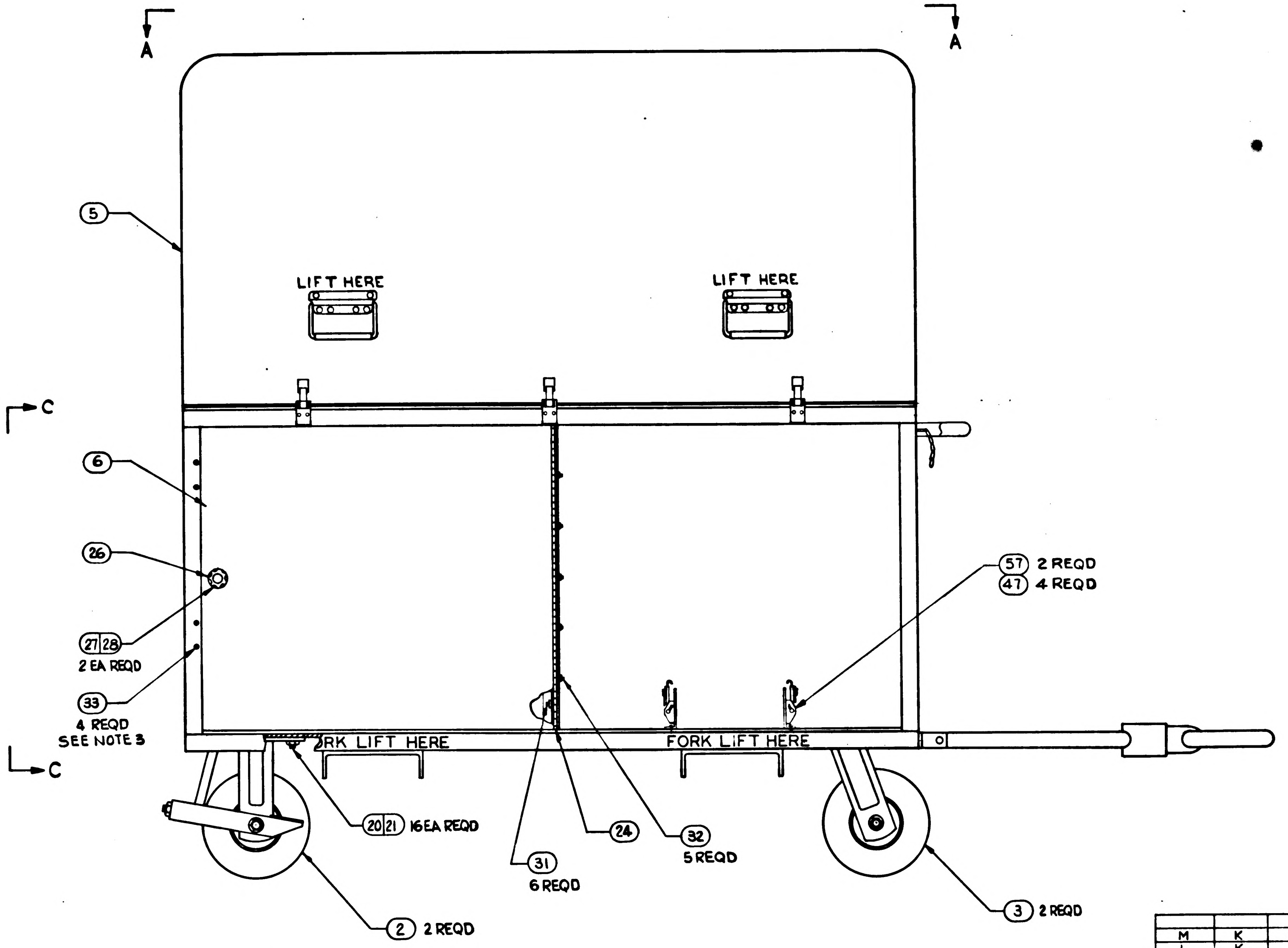
TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 4 OF 4

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K	B-4	REPLACES REV. J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR -200		FEB 65	JW
L	B-4	REVISED PER TDRR 18385	—	APR 65	JW
M	E-2	REVISED PER TDRR 18891	—	17 MAY 65	AN

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS ⑱㉚㉝ ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM ㊱ OR ITEM ㊵ IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM ㊹ TO ITEM ㊾ SECURELY.
7. STENCILING OMITTED ON ITEMS (53)(54)(55).



M	K	M	L
L	K	K	L
K	K	K	K
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

Ⓚ REPLACES REV J WITH CHANGE

			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2	—		57	1901923	FASTENER POS. LOCK (INSEP ASSY)
			1	—		56	1901850-011	PLATE AND CLAMP ASSY
			1	—		55	1902070-011	PLATE ASSY, D&C COMPONENTS
			1	—		54	1902066-011	PLATE ASSY, DSKY & ELEC COMP
			1	—		53	1902425-011	SHELF ASSY, MOUNTING, AGC ASSY
			1	1		52	1901641	BRACKET, U-SHAPED
			2	2		51	MS 35338-81	WASHER, LOCK
			4	4		50	AN 960 C10	(1897006-017) WASHER, FLAT
			1	1		49	1016336-001	SNAP - SWIVEL
			4	4		48	AN 345C10	(1897146-110) NUT, PLAIN HEX
			4	—		47	MS35216-43	SCREW, MACH PAN HEAD
			1	1		46	AN960-C4L	WASHER, FLAT (1897006-034)
SEE NOTE 4			1	1		45	1006783-20	SCREW, BUTTON HEAD
SEE NOTE 4 & 6			1	1		44	1016067-12	CHAIN, SAFETY
			—	4		43	MS 35217-071	SCREW-MACH PAN HEAD
			—	8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4			—	6		41	1006783-62	SCREW - BUTTON HEAD
			1	—		40	1901304-237	NAME PLATE
SEE NOTE 4			12	12		39	1015826-300	SCREW - FLAT HEAD
			4	4		38	MS16624-4050	RING, RETAINING
			4	4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
			—	1		36	1901304-206	NAMEPLATE
			2	2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4			6	6		34	1015831-193	SCREW-FLAT HEAD
SEE NOTES 3&4			4	4		33	1015826-324	SCREW-FLAT HEAD
			5	5		32	MS35223-6	SCREW-PAN HEAD
			6	6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4			30	30		30	1015826-304	SCREW-FLAT HEAD
			1	1		29	1900708	WIRE LIST A-A
SEE NOTE 4			2	2		28	1016831-245	SCREW-FLAT HEAD
			2	2		27	MS20365-832A	NUT-SELF LOCKING
SEE NOTE 4			1	1		26	1016099-001	LATCH-DOOR
			1	1		25	1900711	TOP PLATE
			1	1		24	1900709	CONTINUOUS HINGE
			2	2		23	1900904	PIN, TOE BAR
			16	16		22	MS35217-52	SCREW-PAN HD
			16	16		21	MS20365-820C	NUT-SELF LOCKING
SEE NOTE 4			16	16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4			—	6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3			4	4		18	1900599	BRACKET, ANGLE
SEE NOTE 4			2	2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4			2	2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4			1	1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4			4	4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
			—	1		13	1900605	AGC MOUNTING BRACKET
			1	1		12	1900952-011	PSA MOUNTING BRACKET ASSY
			—	1		11	1900753-011	NAV. BASE OPTICS MTG PANEL
			—	1		10	1900688-011	D&C MTG PANEL ASSY
			1	1		9	1900687-011	IMU MTG PANEL ASSY
			1	1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
			1	1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
			1	1		6	1900596	DOOR, EQUIPMENT
			1	1		5	1900595	COVER (INSEP ASSY)
			1	1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4			2	2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4			2	2		2	1016070-008	CASTER, RIGID W/BRAKE
			1	1		1	1900593	TRANSPORTATION CART (INSEP ASSY)
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-021
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN H. Leide DATE 22 DEC 64
CHECKED C. Piopka 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL W.J. R 3-5-65
MIT APPROVAL

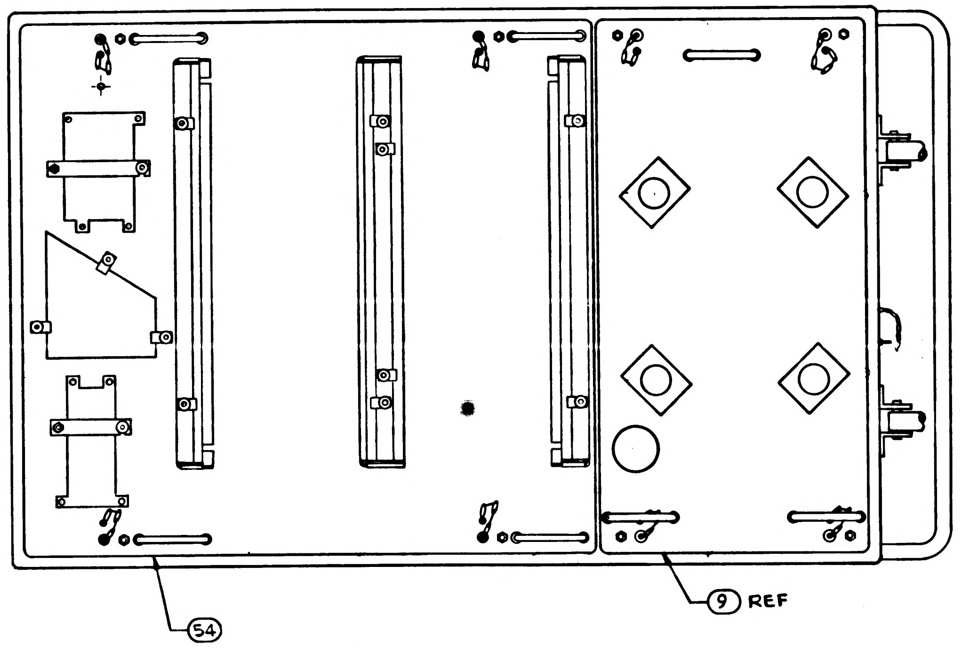
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

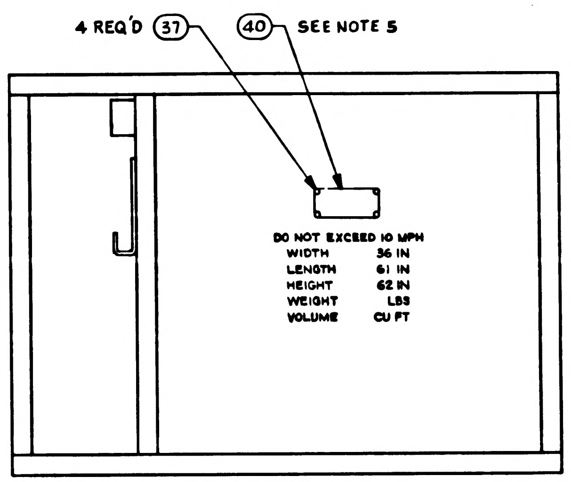
CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 1 OF 4

REVISIONS TDRR 02663

SYM	ZONE	DESCRIPTION	DATE	APPD.
K		THIS SHEET ADDED ~~PER~~ TDRR 17200	5 FEB 65	
M	D2;3	REVISED PER TDRR 18891	7 MAY 65	A.N.

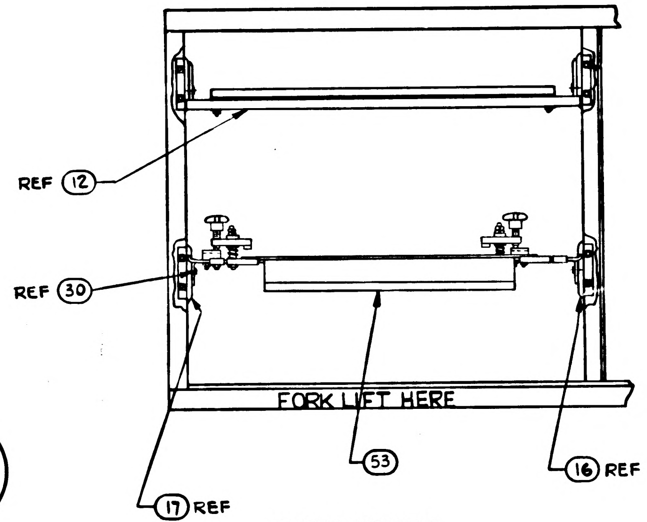


VIEW A-A
COVER REMOVED



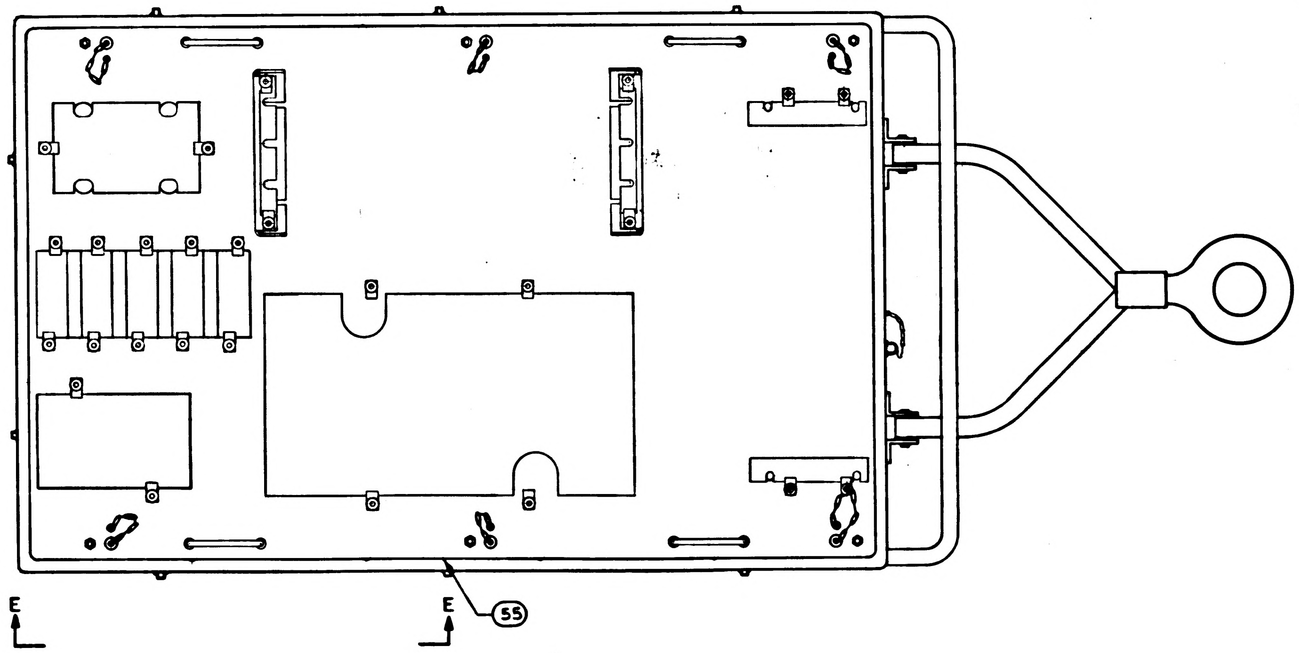
4 REQ'D 37
40 SEE NOTE 5
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT LBS
VOLUME CU FT

VIEW C-C



REF 12
REF 30
FORK LIFT HERE
53
16 REF
17 REF

PARTIAL VIEW E-E
DOOR REMOVED



VIEW A-A
COVER REMOVED

Ⓚ THIS SHEET ADDED

1900030-011	1900C30-011	-021
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ___ ± ___ ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ___
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A. Lauke DATE 22 DEC 64
CHECKED C. Prozda 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL W. J. Kl 3-2-65
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

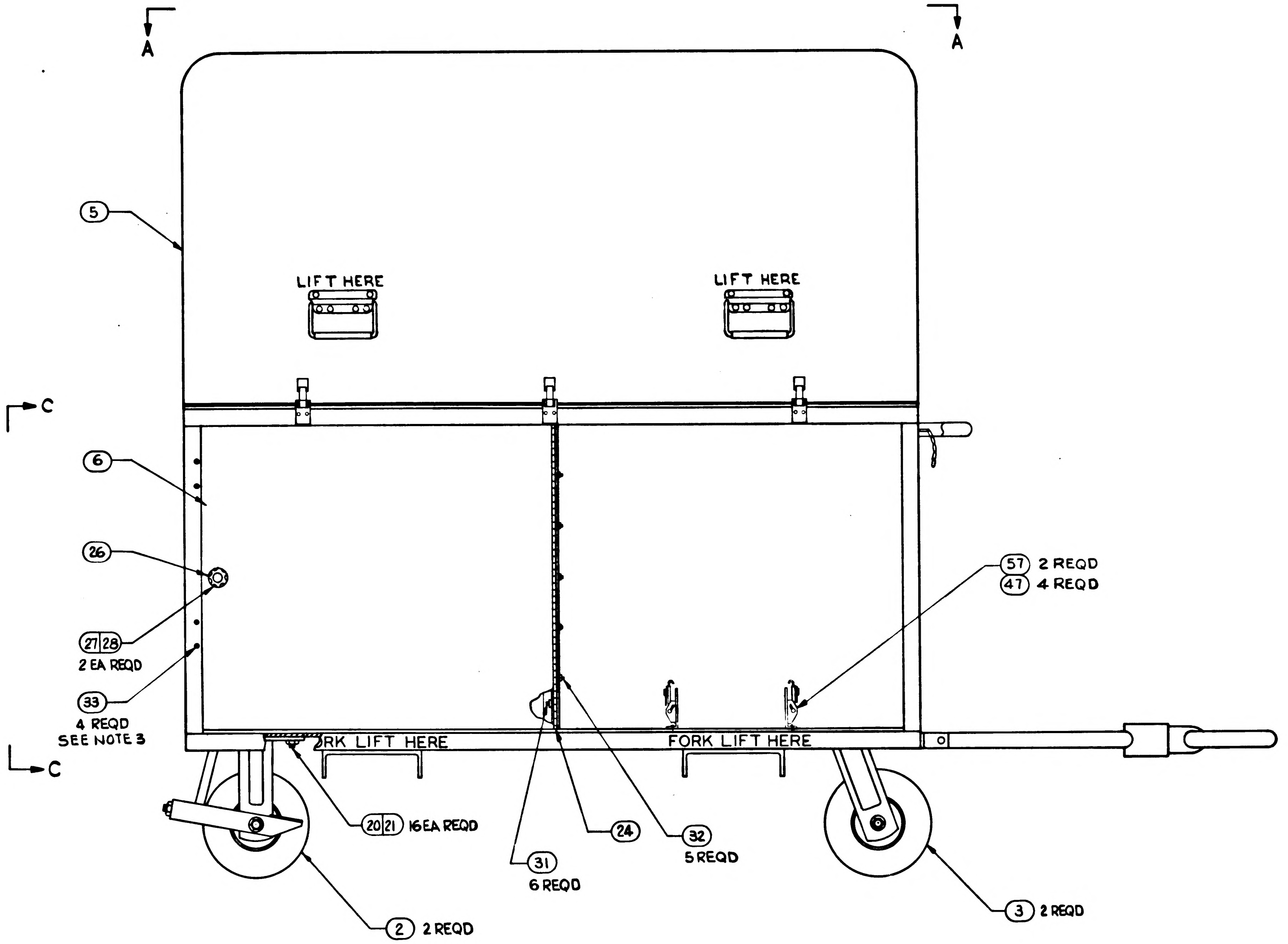
TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 3 OF 4

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS (18)(30)(33) ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM (36) OR ITEM (40) IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM (44) TO ITEM (49) SECURELY.
7. STENCILING OMITTED ON ITEMS (53)(54)(55).

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K	B-4	REPLACES REV J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR [illegible]200		FEB 65	[illegible]
L	B-4	REVISED PER TDRR 18385	—	[illegible] APR 65	[illegible]
M	E-2	REVISED PER TDRR 18891	—	17 MAY 65	AN
N		REVISED PER TDRR 20228	—	28 JUL 65	[illegible]



(K) REPLACES REV J WITH CHANGE

			2	—		57	1901923	FASTENER POS LOCK (INSEP ASSY)
			1	—		56	1901850-011	PLATE AND CLAMP ASSY
			1	—		55	1902070-011	PLATE ASSY, D&C COMPONENTS
			1	—		54	1902066-011	PLATE ASSY, DSKY & ELEC COMP
			1	—		53	1902425-011	SHELF ASSY, MOUNTING, AGC ASSY
			1	1		52	1901641	BRACKET, U-SHAPED
			2	2		51	MS 35338-81	WASHER, LOCK
			4	4		50	AN 960 C10	(1897006-017) WASHER, FLAT
			1	1		49	1016336-001	SNAP - SWIVEL
			4	4		48	AN 345C10	(1897146-110) NUT, PLAIN HEX
			4	—		47	MS35216-43	SCREW, MACH PAN HEAD
			1	1		46	AN960-C4L	WASHER, FLAT (1897006-034)
SEE NOTE 4			1	1		45	1006783-20	SCREW, BUTTON HEAD
SEE NOTE 4 & 6			1	1		44	1016067-12	CHAIN, SAFETY
			—	4		43	MS 35217-071	SCREW-MACH PAN HEAD
			—	8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4			—	6		41	1006783-62	SCREW - BUTTON HEAD
			1	—		40	1901304-237	NAME PLATE
SEE NOTE 4			12	12		39	1015826-300	SCREW - FLAT HEAD
			4	4		38	MS16624-4050	RING, RETAINING
			4	4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
			—	1		36	1901304-206	NAMEPLATE
			2	2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4			6	6		34	1015831-193	SCREW-FLAT HEAD
SEE NOTES 3 & 4			4	4		33	1015826-324	SCREW-FLAT HEAD
			5	5		32	MS35223-6	SCREW-PAN HEAD
			6	6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4			30	30		30	1015826-304	SCREW-FLAT HEAD
			1	1		29	1900708	WIRE LIST A-A
SEE NOTE 4			2	2		28	1016831-245	SCREW-FLAT HEAD
			2	2		27	MS20365-832A	NUT-SELF LOCKING
SEE NOTE 4			1	1		26	1016099-001	LATCH-DOOR
			1	1		25	1900711	TOP PLATE
			1	1		24	1900709	CONTINUOUS HINGE
			2	2		23	1900904	PIN, TOE BAR
			16	16		22	MS35217-52	SCREW-PAN HD
			16	16		21	MS20365-820C	NUT-SELF LOCKING
SEE NOTE 4			16	16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4			—	6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3			4	4		18	1900599	BRACKET, ANGLE
SEE NOTE 4			2	2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4			2	2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4			1	1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4			4	4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
			—	1		13	1900605	AGC MOUNTING BRACKET
			1	1		12	1900952-011	PSA MOUNTING BRACKET ASSY
			—	1		11	1900753-011	NAV. BASE OPTICS MTG PANEL
			—	1		10	1900688-011	D&C MTG PANEL ASSY
			1	1		9	1900687-011	IMU MTG PANEL ASSY
			1	1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
			1	1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
			1	1		6	1900596	DOOR, EQUIPMENT
			1	1		5	1900595	COVER (INSEP ASSY)
			1	1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4			2	2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4			2	2		2	1016070-008	CASTER, RIGID W/BRAKE
			1	1		1	1900593	TRANSPORTATION CART (INSEP ASSY)
	QUANTITY REQUIRED		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-021
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN H. Friede DATE 22 DEC 64
CHECKED C. Piaple 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL W. J. R[illegible] 3-9-65
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

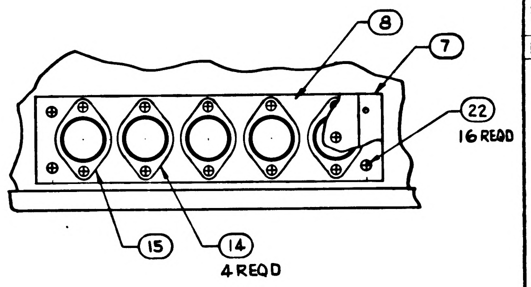
TRANSPORTATION CART, G & N

ASSEMBLY

CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 1 OF 4

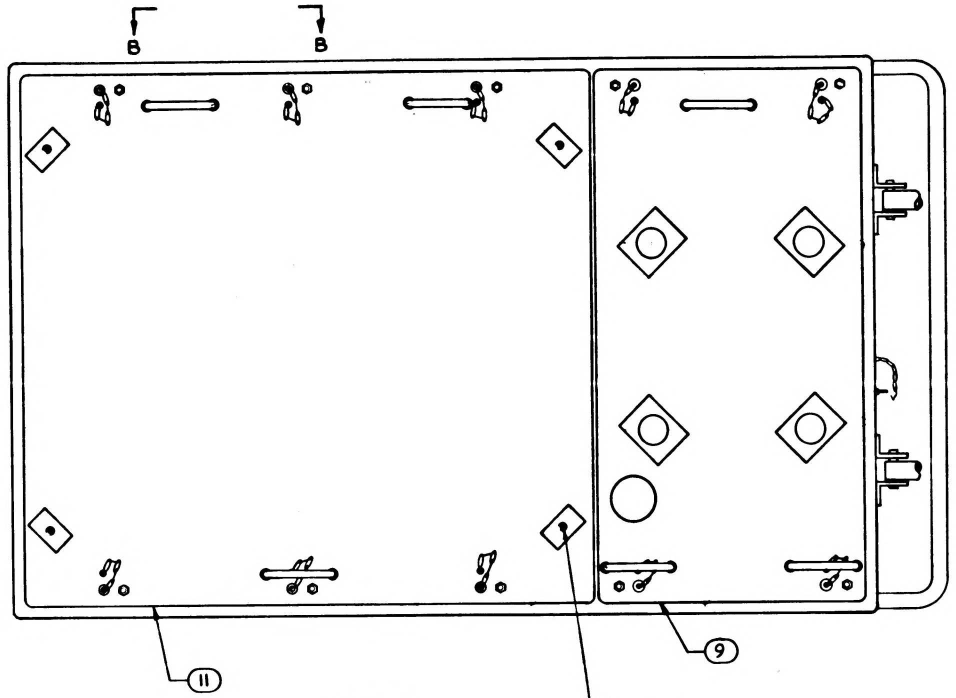
N
1900009

REVISIONS TDCR [illegible]				
SYM	ZONE	DESCRIPTION	DATE	APPD
K	B-2	REPLACES REV. J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR 17200	FEB 65	JWF
N		REVISION STATUS CHANGED	28 JUL 65	WCR



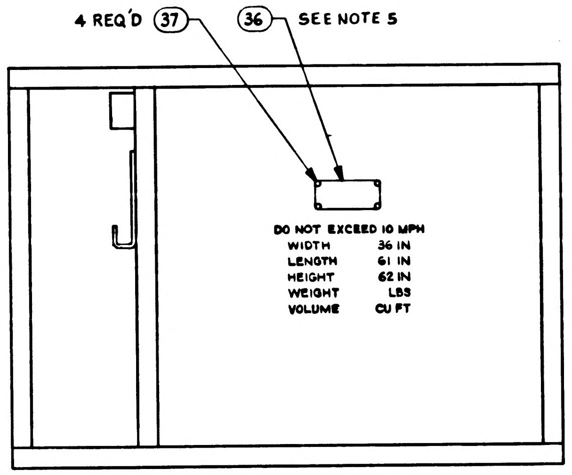
8
7
22
16 REQD
15
14
4 REQD

PARTIAL VIEW B-B
1:2 SCALE



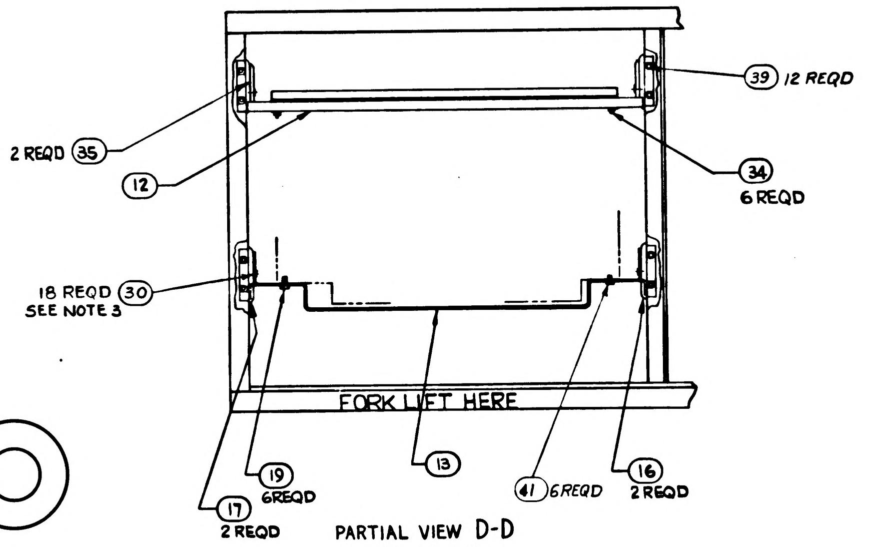
B
B
11
9
43 4 REQD

VIEW A-A
COVER REMOVED
(10) REMOVED
(9) & (11) MOUNTED



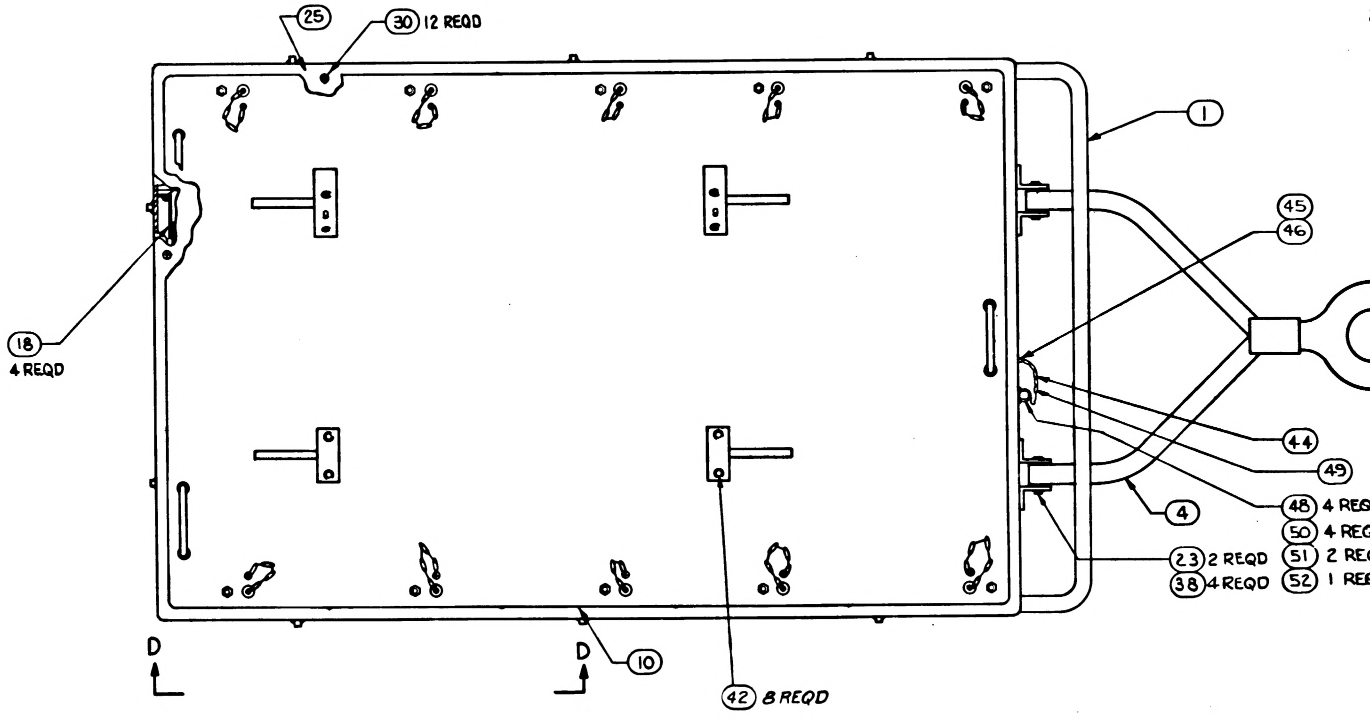
4 REQ'D 37
36 SEE NOTE 5
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT LBS
VOLUME CU FT

VIEW C-C



39 12 REQD
2 REQD 35
12
34
6 REQD
18 REQD 30
SEE NOTE 3
FORK LIFT HERE
19
6 REQD
17
2 REQD
13
41 6 REQD
16
2 REQD

PARTIAL VIEW D-D
DOOR REMOVED



25
30 12 REQD
1
45
46
18
4 REQD
44
49
4
48 4 REQ'D
50 4 REQ'D
23 2 REQD
51 2 REQ'D
38 4 REQD
52 1 REQ'D
D
D
10
42 8 REQD

VIEW A-A
COVER REMOVED
(10) MOUNTED ON TOP PLATE

Ⓚ REPLACES REV J WITH CHANGE

1900030-011	1900030-011	-021
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

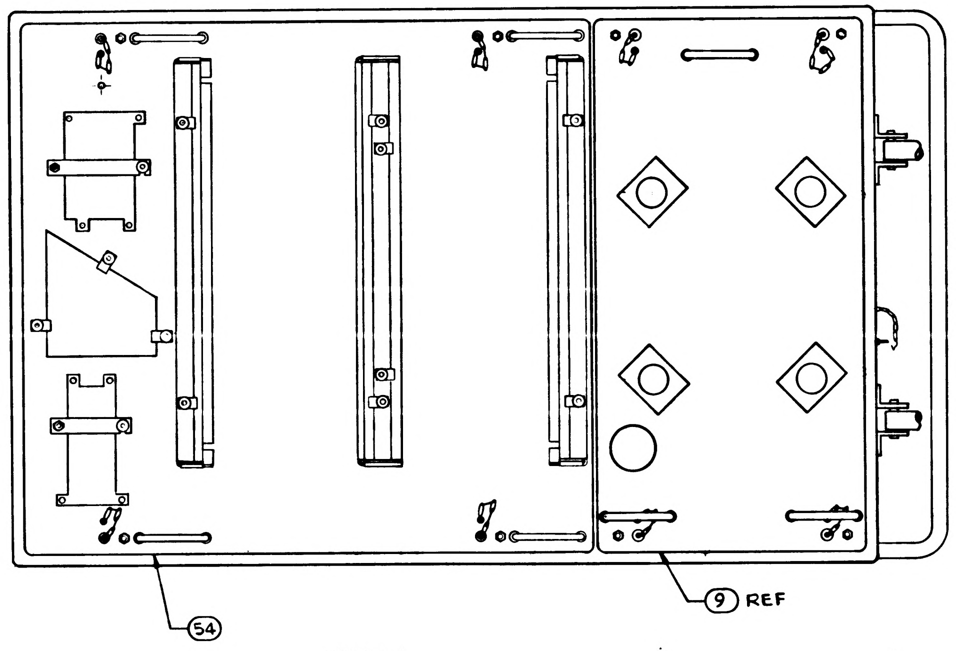
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 22 DEC 64
CHECKED C. Pizzda 29 DEC 64
APPROVAL A. Smyth 29 DEC 64
APPROVAL
NASA APPROVAL 3-9 W J K
MIT APPROVAL McMurdy

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

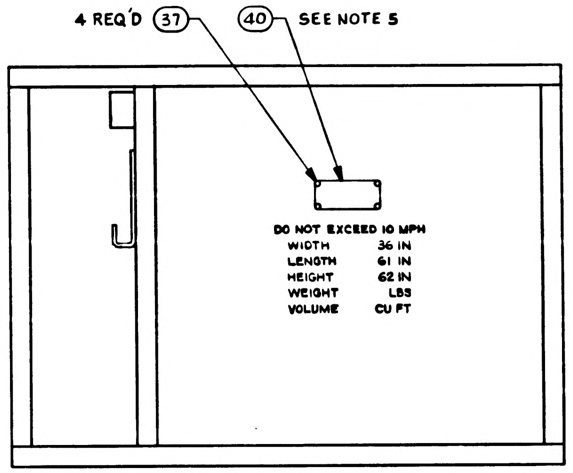
TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 2 OF 4

REVISIONS TCCR 22663				
SYM	ZONE	DESCRIPTION	DATE	APPD
K		THIS SHEET ADDED PER TDRR 17230	FEB 65	
M	D2;3	REVISED PER TDRR 18891	MAY 65	A.N.
N		REVISED PER TDRR 20228	28 JUN 65	



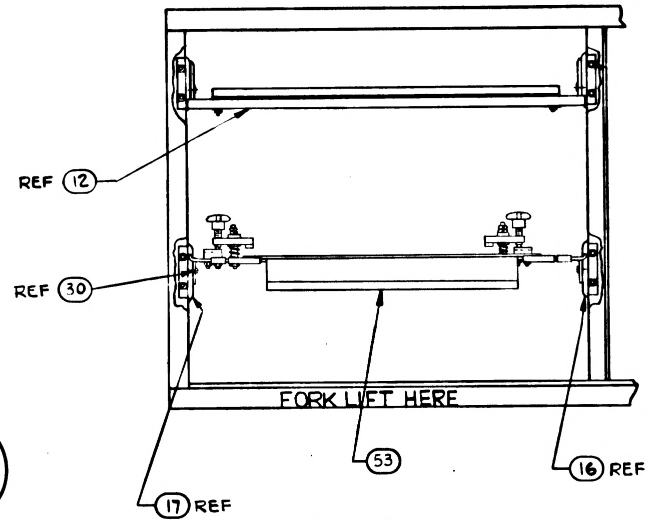
VIEW A-A
COVER REMOVED



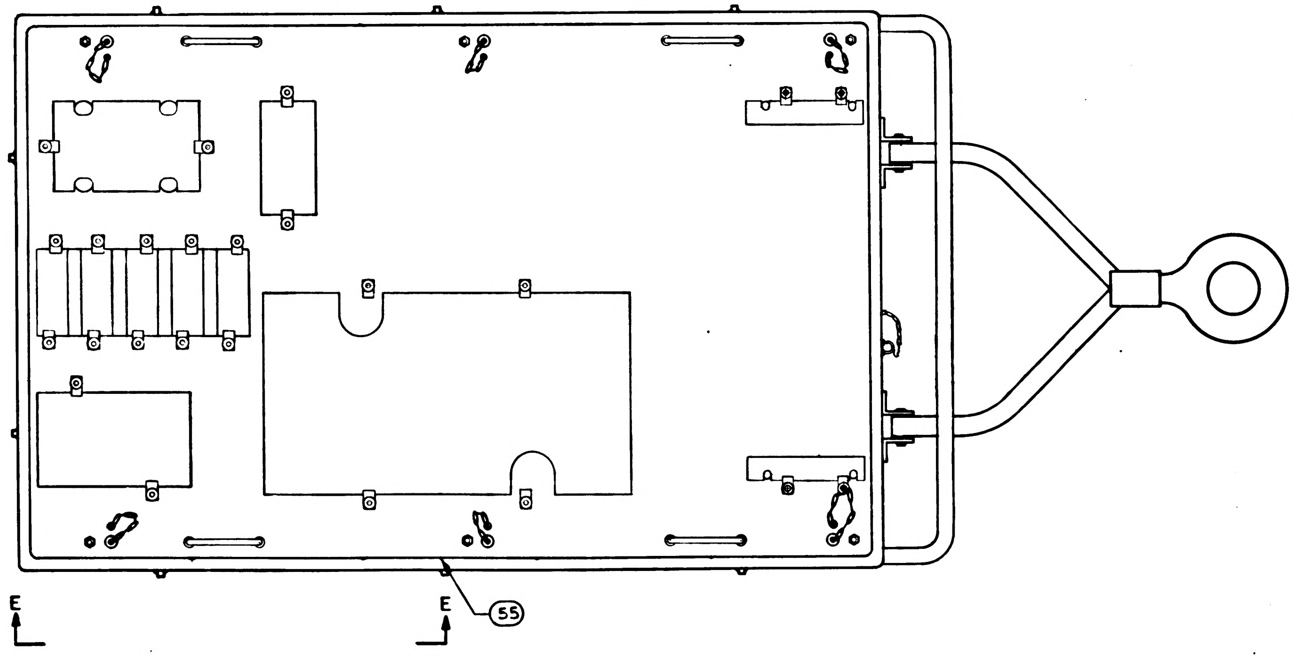
DO NOT EXCEED 10 MPH

WIDTH	36 IN
LENGTH	61 IN
HEIGHT	62 IN
WEIGHT	LBS
VOLUME	CU FT

VIEW C-C



PARTIAL VIEW E-E
DOOR REMOVED



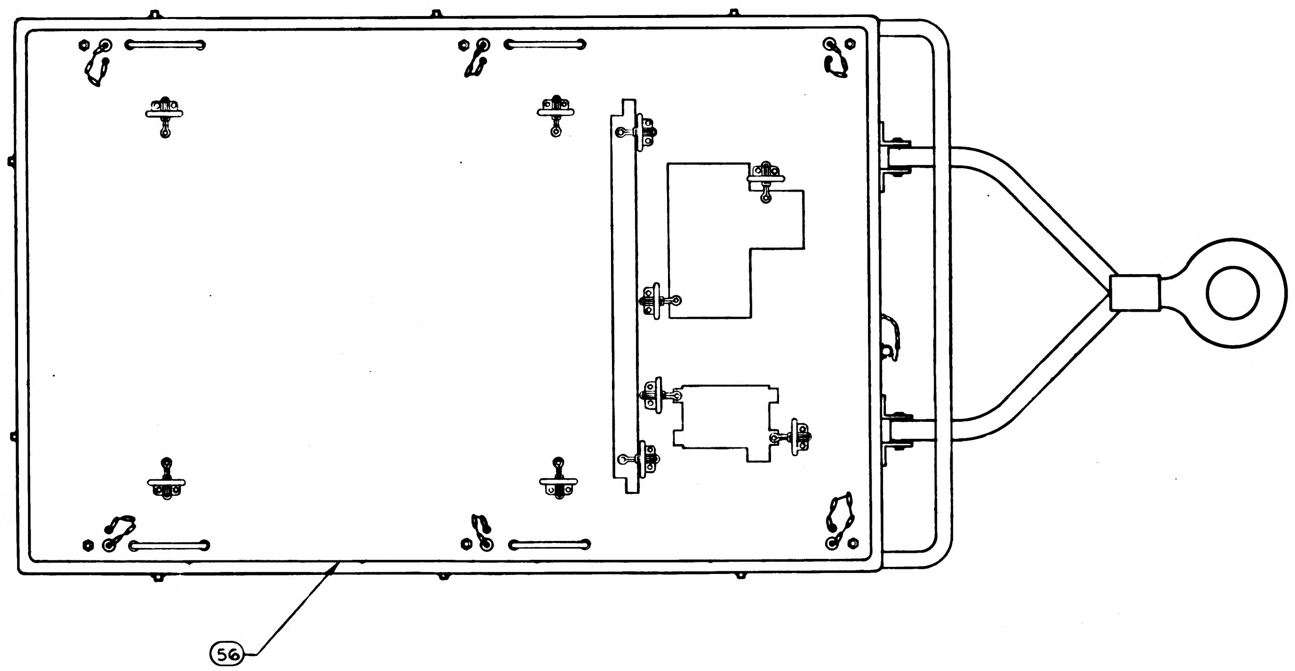
VIEW A-A
COVER REMOVED

(K) THIS SHEET ADDED

1900030-011	1900030-011	-021	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	AC SPARK PLUG DIVISION GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN DATE 22 DEC 64 CHECKED C. Pingda 29 DEC 64 APPROVAL A. Smyth 29 DEC 64 APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS TRANSPORTATION CART, G & N ASSEMBLY
NEXT ASSY	USED ON	APPLICABLE DASH NO.	DO NOT SCALE THIS DRAWING	NASA APPROVAL	CODE IDENT NO. 99974
APPLICATION			MATERIAL	MIT APPROVAL	SIZE E
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES			CONTRACT NAS9-497		1900009
					SCALE 1:4 SHEET 3 OF 4

REVISIONS TDRR 02263

SYM	ZONE	DESCRIPTION	DATE	APPD
K	B-2	THIS SHEET ADDED PER TDRR [illegible]	[illegible] 65	[illegible]
L	C-5	REVISED PER TDRR 18385	APR 65	JWP
N		REVISION STATUS CHANGED	28 JUN 68	[illegible]



VIEW A-A
COVER REMOVED

Ⓚ THIS SHEET ADDED

1900030-011	1900030-011	-021
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 22 DEC 64
CHECKED C. Piojda 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL [illegible] 3-7-[illegible]
MIT APPROVAL M. McMurley

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

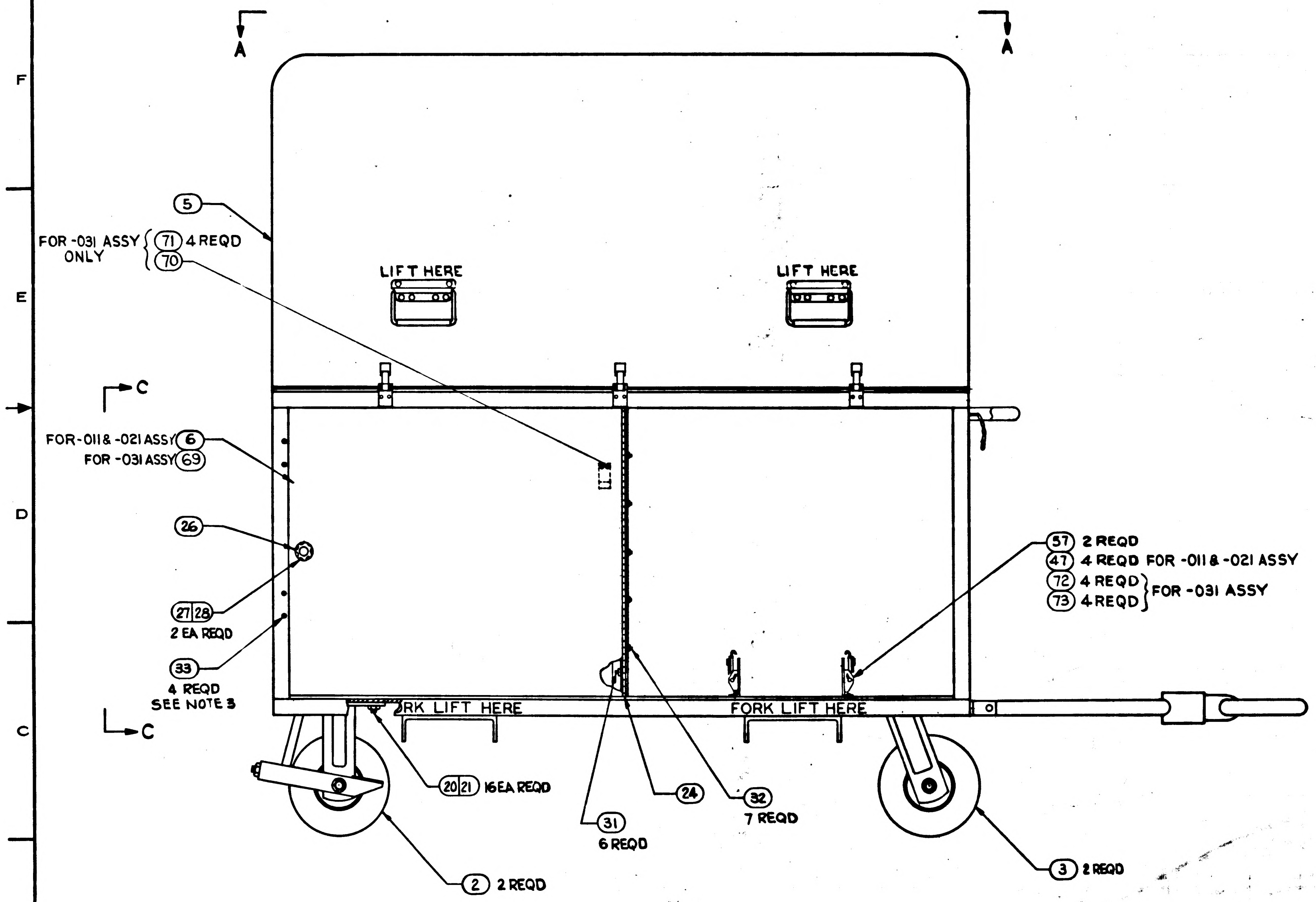
CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 4 OF 4

N
1900009

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. ITEMS ⑱㉚㉝(65)(66) ARE TO BE USED IN LIEU OF HARDWARE FURNISHED WITH SLIDE ASSEMBLIES.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO APPLICABLE NAMEPLATE IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
6. CUT LENGTH OF CHAIN TO PERMIT MINIMUM MOVEMENT BETWEEN TOWBAR & HANDLE. FASTEN ITEM ㊹ TO ITEM ㊾ SECURELY.
7. STENCILING NOT SHOWN ON ITEMS (54)(55)(56)(58)(59)(61).
8. APPLY ITEM (77) TO ITEM (76) PER ND 1002211.

REVISIONS TDRR 22663					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K	B-4	REPLACES REV. J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR 17200		5 FEB 65	JWP / CW
L	B-4	REVISED PER TDRR 18385	—	APR 65	JWP
M	E-2	REVISED PER TDRR 18891	—	17 MAY 65	AN / CW
N		REVISED PER TDRR 20228	—	28 JUN 65	MCR
P		REVISED PER TDRR 26072	—	18 FEB 66	JJJ



REPLACES Ⓚ REPLACES REV J WITH CHANGE

MASTER

		031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		AR	-	-		77	MIL-S-22473 GR C	SEALING & RETAINING COMP (ES2544-3)
		4	-	-		76	MS35233-2	SCREW, MACH, PAN HD
		1	-	-		75	2901010	TRANSPORTATION CART (INSEP ASSY)
		1	-	-		74	1901304-241	NAMEPLATE
		4	-	-		73	MS35338-80	WASHER, LOCK
SEE NOTE 4		4	-	-		72	1006783-27	SCREW, BUTTON HEAD
SEE NOTE 4		2	-	-		71	1015831-197	SCREW, FLAT HEAD
		1	-	-		70	2900882	SHELF STOP
		1	-	-		69	2900883	DOOR, ACCESS
SEE NOTE 4		6	-	-		68	1016151-008	NUT, SELF LOCKING
SEE NOTE 4		6	-	-		67	1006783-28	SCREW, BUTTON HEAD
SEE NOTE 4		10	-	-		66	1016151-010	NUT, SELF LOCKING
SEE NOTE 4		10	-	-		65	1015826-300	SCREW, FLAT HEAD
		1	-	-		64	2900832	BRACKET, SHELF R.H.
		1	-	-		63	2900831	BRACKET, SHELF L.H.
		1	-	-		62	2900887-011	UPPER SHELF ASSY
		1	-	-		61	2900900-011	PLATE ASSY, G&N COMPONENTS
		1	-	-		60	2900903-011	IMU MTG PANEL ASSY
		1	-	-		59	2900908-011	PLATE ASSY, D&C COMPONENTS
		1	—	—		58	2901066-011	SHELF ASSY, MOUNTING, AGC
		2	2	—		57	1901923	FASTENER, POS. LOCK, (INSEP ASSY)
		1	1	—		56	1901850-011	PLATE AND CLAMP ASSY
		-	1	—		55	1902070-011	PLATE ASSY, D&C COMPONENTS
		1	1	—		54	1902066-011	PLATE ASSY, DSKY & ELEC COMP
		-	1	—		53	1902425-011	SHELF ASSY, MOUNTING, AGC ASSY
		1	1	1		52	1901641	BRACKET, U-SHAPED
		2	2	2		51	MS 35335-51	WASHER, LOCK
		4	4	4		50	AN 960 C10	(1897006-017) WASHER, FLAT
SEE NOTE 4		1	1	1		49	1016336-001	SNAP - SWIVEL
		4	4	4		48	AN 345C10	(1897146-110) NUT, PLAIN HEX
		-	4	—		47	MS35216-43	SCREW, MACH PAN HEAD
		1	1	1		46	AN960-C4L	WASHER, FLAT (1897006-034)
SEE NOTE 4		1	1	1		45	1006783-26	SCREW, BUTTON HEAD
SEE NOTE 4 & 6		1	1	1		44	1016067-12	CHAIN, SAFETY
		-	—	4		43	MS 35217-071	SCREW-MACH PAN HEAD
		-	—	8		42	MS 35216-069	SCREW-MACH PAN HEAD
SEE NOTE 4		-	—	6		41	1006783-62	SCREW-BUTTON HEAD
		-	1	—		40	1901304-237	NAMEPLATE
SEE NOTE 4		12	12	12		39	1015826-300	SCREW-FLAT HEAD
		4	4	4		38	MS16624-4050	RING, RETAINING (1897079-150)
		-	4	4		37	AN535-0-3	SCREW, DRIVE (1897109-103)
		-	—	1		36	1901304-206	NAMEPLATE
		-	2	2		35	1900737	SUPPORT-BRACKET
SEE NOTE 4		-	6	6		34	1015831-195	SCREW-FLAT HEAD
SEE NOTES 3 & 4		4	4	4		33	1015826-324	SCREW-FLAT HEAD
		7	7	7		32	MS35223-6	SCREW-PAN HEAD
		6	6	6		31	MS35223-3	SCREW-PAN HEAD
SEE NOTE 4		22	30	30		30	1015826-304	SCREW-FLAT HEAD
		1	1	1		29	1900708	WIRE LIST A-A
SEE NOTE 4		2	2	2		28	1015831-245	SCREW-FLAT HEAD
		2	2	2		27	MS20365-832A	NUT-SELF LOCKING (1897069-033)
SEE NOTE 4		1	1	1		26	1016099-001	LATCH-DOOR
		1	1	1		25	1900711	TOP PLATE
		1	1	1		24	1900709	CONTINUOUS HINGE
		2	2	2		23	1900904	PIN, TOE BAR
		16	16	16		22	MS35217-52	SCREW-PAN HD
		16	16	16		21	MS20365-820C	NUT-SELF LOCKING (1897069-056)
SEE NOTE 4		16	16	16		20	1015826-659	SCREW-FLAT HD
SEE NOTE 4		-	—	6		19	1006783-62	SCREW-BUTTON HD
SEE NOTE 3		4	4	4		18	1900599	BRACKET, ANGLE
SEE NOTE 4		2	2	2		17	1015791-016	SLIDE ASSY (L.H.)
SEE NOTE 4		2	2	2		16	1015791-015	SLIDE ASSY (R.H.)
SEE NOTE 4		1	1	1		15	1016064	CONNECTOR-PLUG ELEC.
SEE NOTE 4		4	4	4		14	1015975-001	CONNECTOR-RECEPT. ELEC.
		-	—	1		13	1900605	AGC MOUNTING BRACKET
		-	1	1		12	1900952-011	PSA MOUNTING BRACKET ASSY
		-	—	1		11	1900758-011	NAV. BASE OPTICS MTG PANEL
		-	—	1		10	1900688-011	D&C MTG PANEL ASSY
		-	1	1		9	1900687-011	IMU MTG PANEL ASSY
		1	1	1		8	1900598	PANEL, CONNECTOR (INSEP ASSY)
		1	1	1		7	1900597	BOX, CONNECTOR (INSEP ASSY)
		-	1	1		6	1900596	DOOR, EQUIPMENT
		1	1	1		5	1900595	COVER (INSEP ASSY)
		1	1	1		4	1900594	TOW BAR (INSEP ASSY)
SEE NOTE 4		2	2	2		3	1016069-008	CASTER, SWIVEL
SEE NOTE 4		2	2	2		2	1016070-008	CASTER, RIGID W/BRAKE
		-	1	1		1	1900593	TRANSPORTATION CART (INSEP ASSY)

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-031
1900030	1900050	-021

APPLICATION

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TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP MILWAUKEE WIS.
DRAWN H. Lise 22 DEC 64
CHECKED C. Piegler 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL W. J. R.
MIT APPROVAL M. McHurley

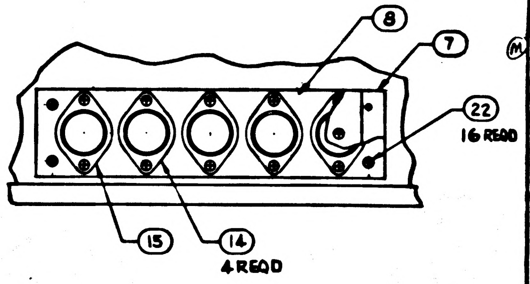
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 1 OF 4

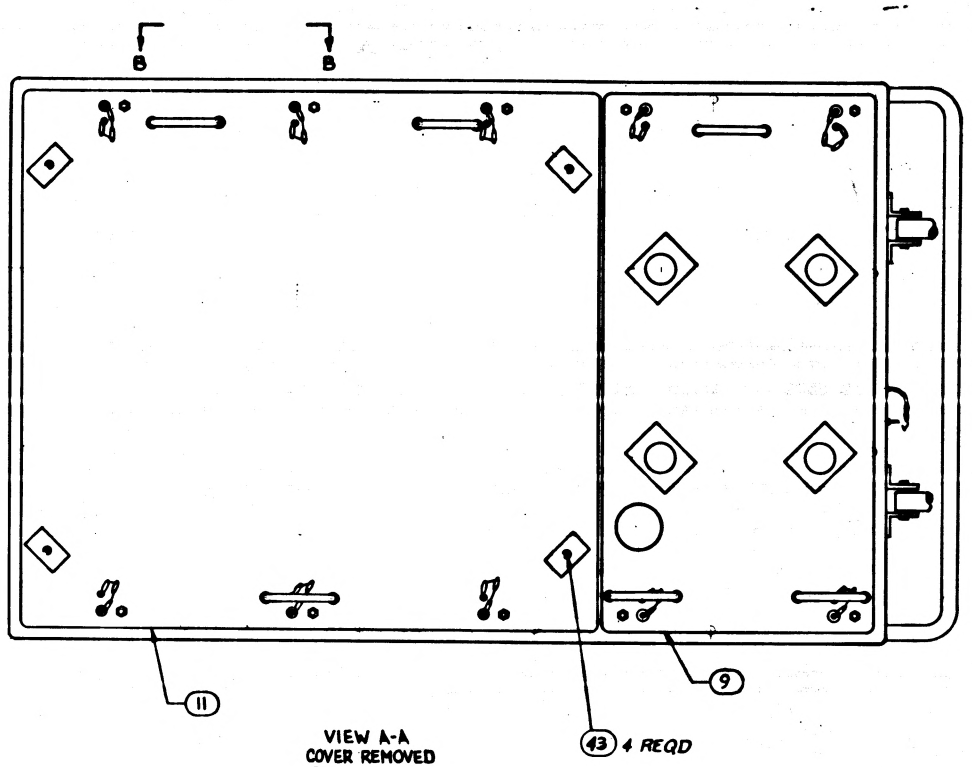
SYM	ZONE	DESCRIPTION	DATE	APPD.
K	B2	REPLACES REV. J WITH CHANGE UPGRADED TO CLASS A REVISED PER TDR 17200	5 FEB 65	JWP
Ⓜ N		REVISION STATUS CHANGED	28 JUN 65	MCR
P		REVISED PER TDRR 26072	16 FEB	JJJ

REVISIONS TDRR 02263



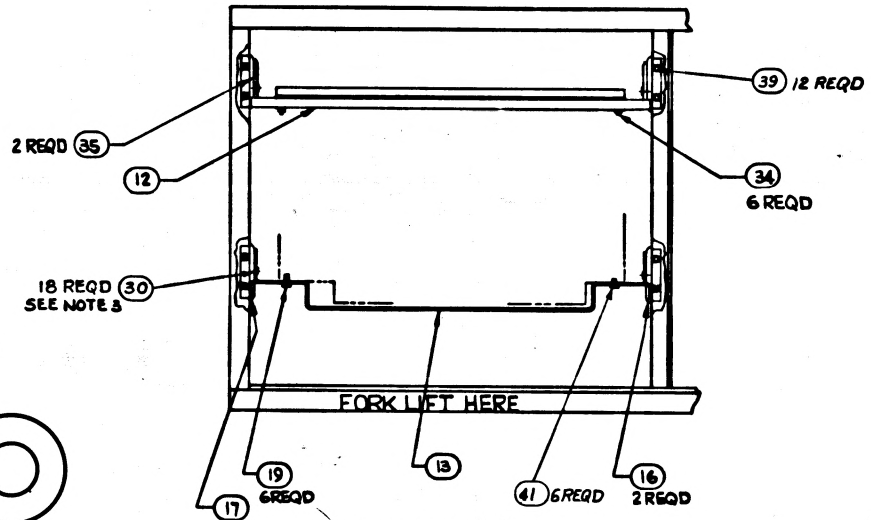
8
7
22
16 REQD
15
14
4 REQD

PARTIAL VIEW B-B
1:2 SCALE



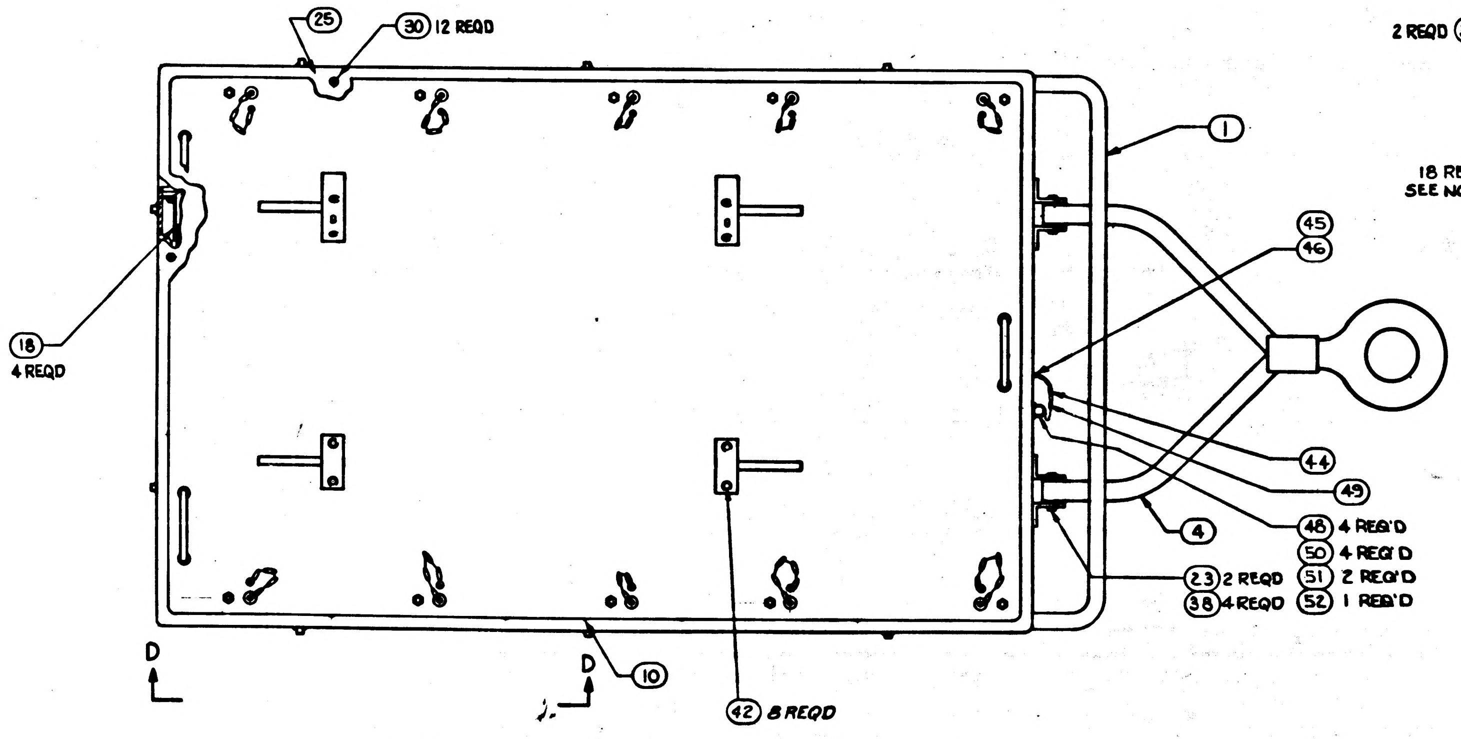
B
B
11
9
43 4 REQD

VIEW A-A
COVER REMOVED
⑩ REMOVED
⑨ & ⑪ MOUNTED



39 12 REQD
2 REQD 35
12
34
6 REQD
18 REQD 30
SEE NOTE 3
FORK LIFT HERE
13
19
6REQD
41 6REQD
16
2 REQD
17
2 REQD

PARTIAL VIEW D-D
DOOR REMOVED



25
30 12 REQD
1
18
4 REQD
45
46
44
49
4
48 4 REQ'D
50 4 REQ'D
51 2 REQ'D
52 1 REQ'D
23 2 REQD
38 4 REQD
D
D
10
42 8 REQD

VIEW A-A
COVER REMOVED
⑩ MOUNTED ON TOP PLATE

Ⓚ REPLACES REV J WITH CHANGE

MASTER

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

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TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN 22 DEC 64 DATE
CHECKED C. Pirjda 29 DEC 64
APPROVAL A. Smith 29 DEC 64
APPROVAL
NASA APPROVAL 3-4-65
MIT APPROVAL

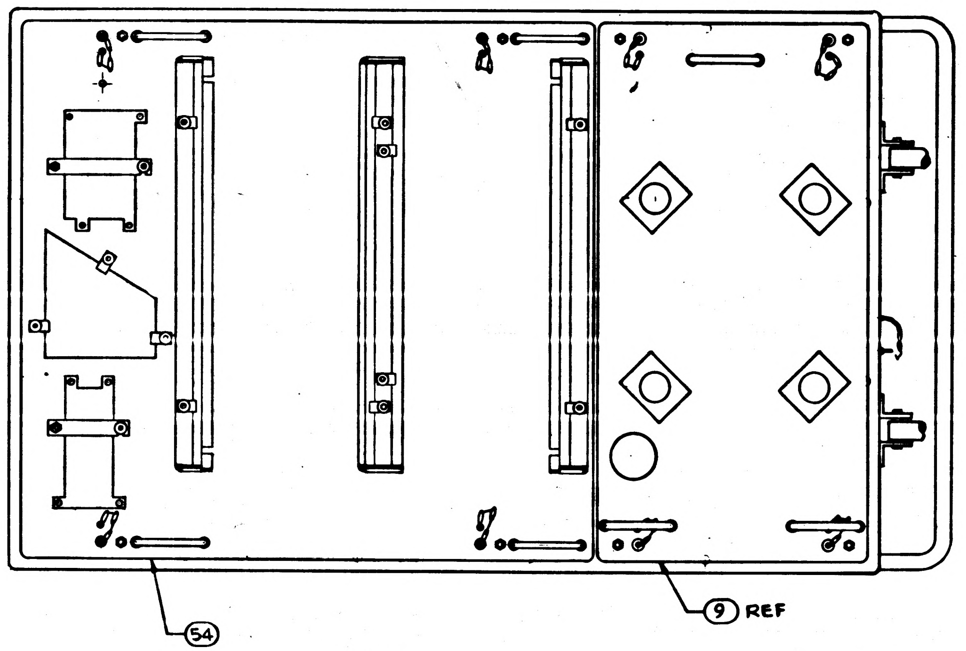
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

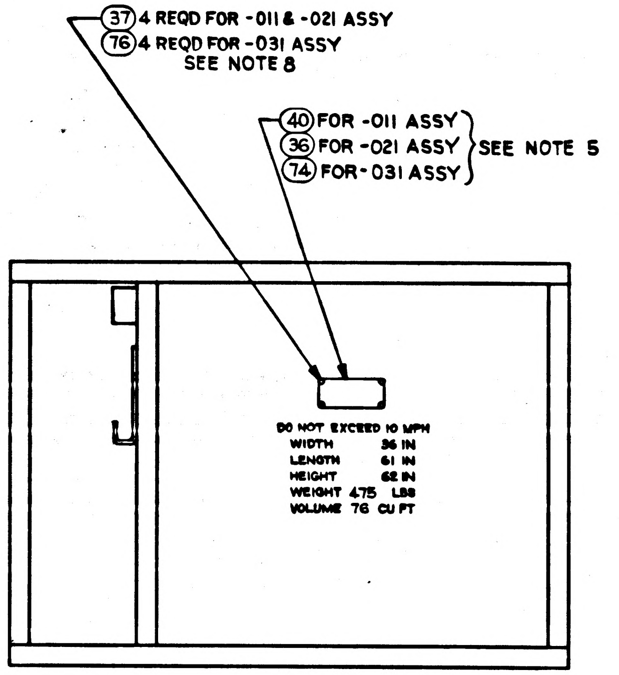
CODE IDENT NO. 99974
SIZE E
1900009
SCALE 1:4
SHEET 2 OF 4

1900009 P

REVISIONS *TDRR 02663*				
SYM	ZONE	DESCRIPTION	DATE	APPD.
K		THIS SHEET ADDED PER TDRR *17200*	5 FEB 65	
Ⓜ M	D2;3	REVISED PER TDRR 18891	7 MAY 65	A.K.
Ⓜ N		REVISED PER TDRR 20228	28 JUN 65	MCR
P		REVISED PER TDRR 26072	10 FEB 66	JJJ AU



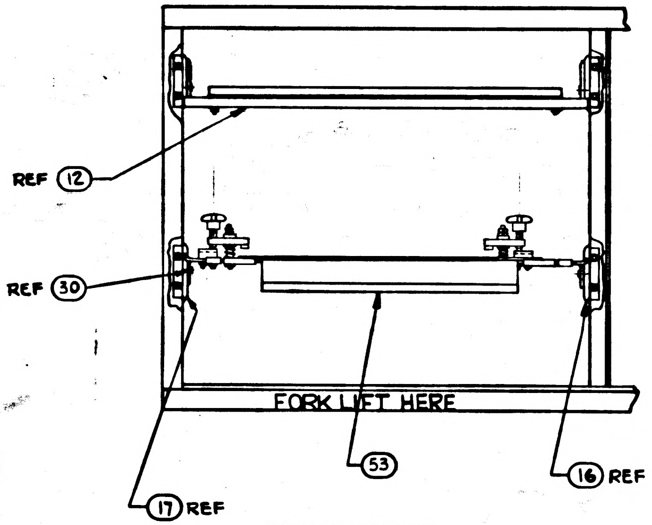
VIEW A-A
COVER REMOVED



37 4 REQD FOR -011 & -021 ASSY
76 4 REQD FOR -031 ASSY
SEE NOTE 8
40 FOR -011 ASSY
36 FOR -021 ASSY
74 FOR -031 ASSY
SEE NOTE 5

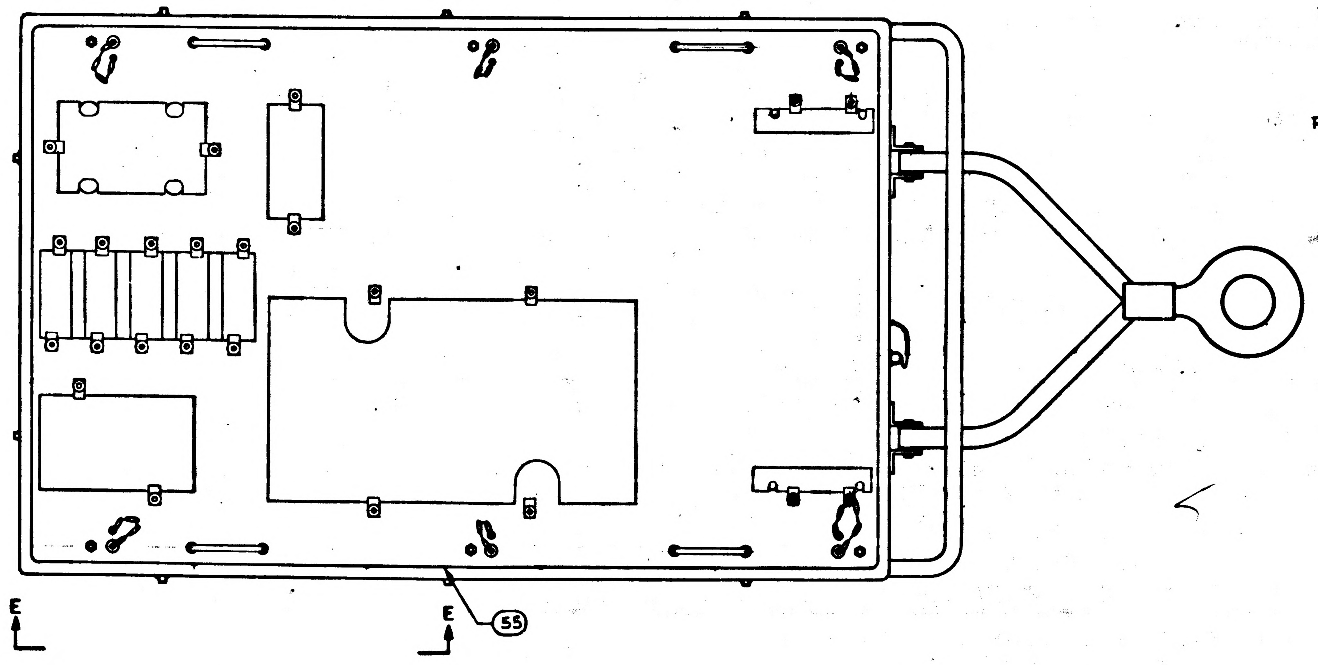
DO NOT EXCEED 10 MPH
WIDTH 36 IN
LENGTH 61 IN
HEIGHT 62 IN
WEIGHT 475 LBS
VOLUME 76 CU FT

VIEW C-C



REF 12
REF 30
FORK LIFT HERE
17 REF
53
16 REF

PARTIAL VIEW E-E
DOOR REMOVED



VIEW A-A
COVER REMOVED

Ⓚ THIS SHEET ADDED

MASTER

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

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MATERIAL —
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP MILWAUKEE WIS.
DRAWN *[illegible]* DATE *28 DEC 64*
CHECKED *C. Projda 29 DEC 64*
APPROVAL *A. Smith 29 DEC 64*
APPROVAL *[illegible]*
3-6-65
NASA APPROVAL *W. J. Rhine*
MIT APPROVAL *McKinley*

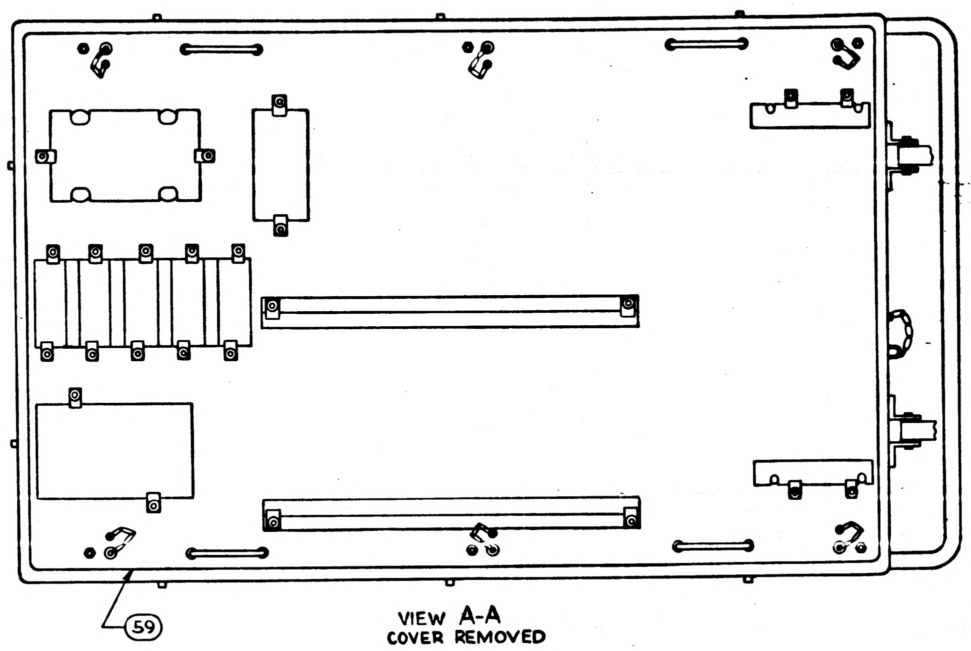
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

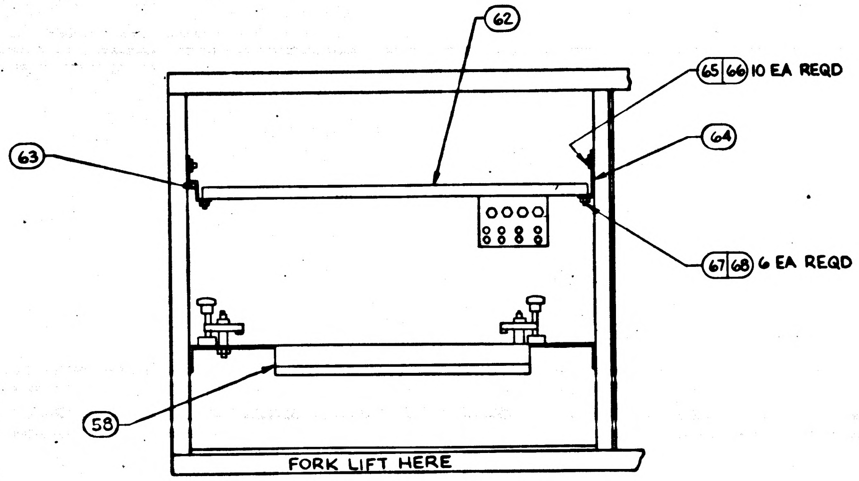
CODE IDENT NO. 99974 SIZE E 1900009
SCALE 1:4 SHEET 3 OF 4

1900009 P

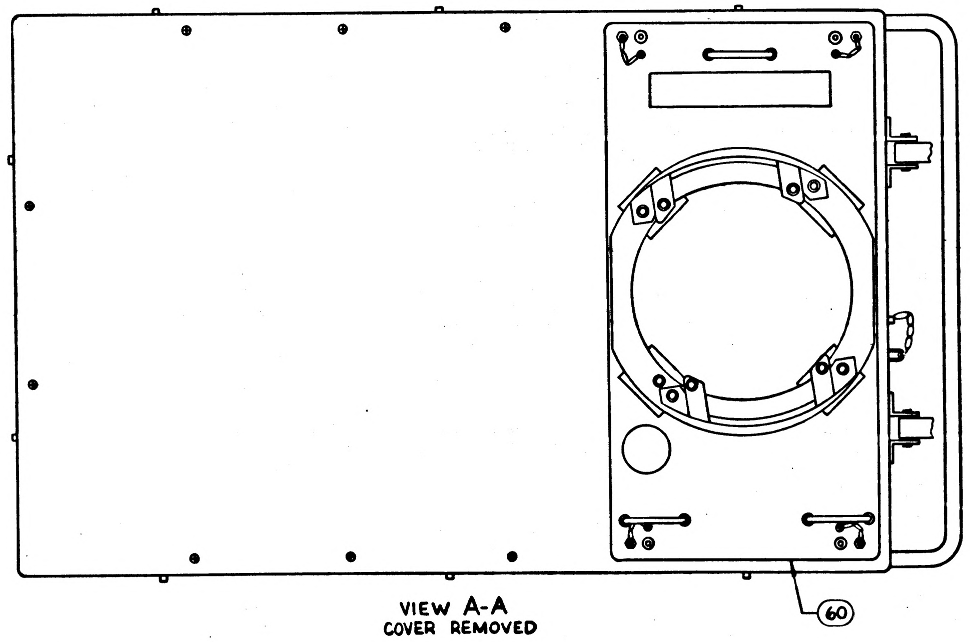
REVISIONS					
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPROVED
	P	REPLACES REV N WITH CHANGE PER TDRR 26072		20 JAN 66	



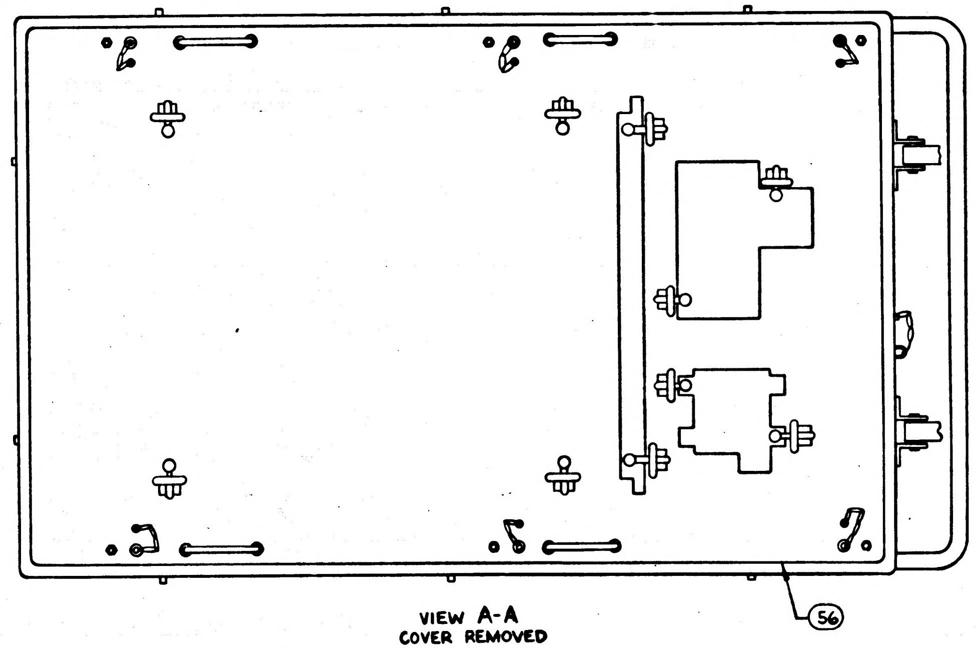
VIEW A-A
COVER REMOVED



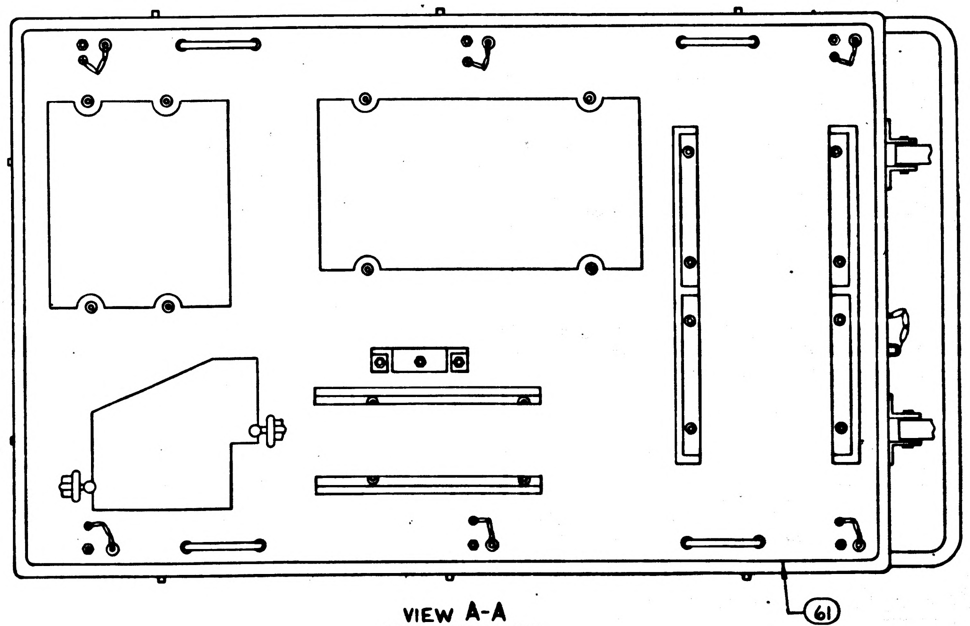
PARTIAL VIEW E-E
DOOR REMOVED
FOR -031 ASSY



VIEW A-A
COVER REMOVED



VIEW A-A
COVER REMOVED



VIEW A-A
COVER REMOVED

MASTER

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-031
1900030	1900030	-021
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± —
3 PLACE DECIMALS ± —
ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
APPROVAL —

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN E. Miller DATE 21 DEC 65
CHECKED Jan 66
APPROVAL 4/1/66
CONTRACT NAS9 - 497
NASA APPROVAL A. C. METZGER
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSPORTATION CART, G & N
ASSEMBLY

SIZE	CODE IDENT NO.	
E	99974	1900009

SCALE 1:4
SHEET 4 OF 4

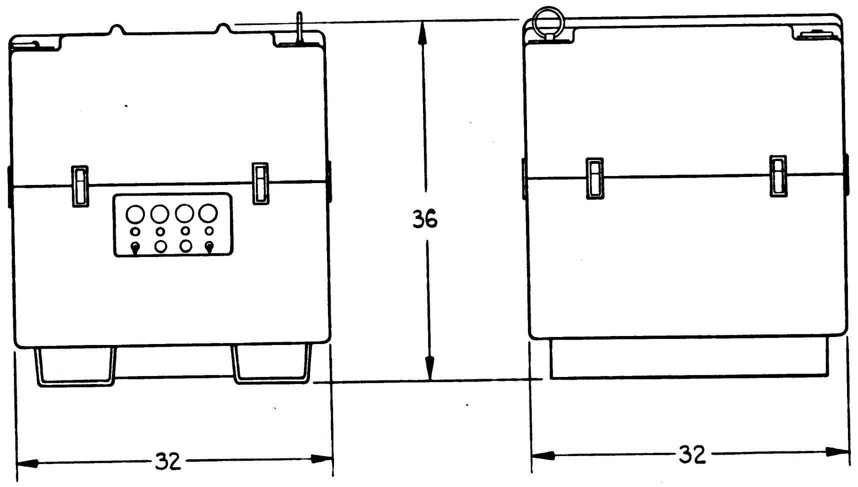
0100061

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B4		(1) REPLACE REV A WITH CHANGE (2) ADDED PICTURE REQUIREMENTS AND VENDOR (3) WAS C SIZE DWG (4) TITLE WAS "IMU SHIPPING CONTAINER"	D.O. 51453	6 APR 63	
C		TITLE WAS "IMU CONTAINER, SHIPPING AND TRANSFER, REUSABLE."		7 MAY 63	

REQUIREMENTS:

PROCUREMENT SPECIFICATION PS-1900010

PICTURE INCOMPLETE



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01212 DATE 8 May 63

(B1) REPLACES REV A WITH CHANGE

QUALIFIED VENDOR:

CRYO-THERM INC
FOGELSVILLE, PENNSYLVANIA

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +2 −2
DECIMALS + — − —
ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19 MAR 63
MALIKOWSKI 25 MAR 63
CHECKED
APPROVAL A.M. BRAY 25 MAR 63
APPROVAL A.J. KODEL 25 MAR 63
NASA APPROVAL 5/8/63
L Gedeman 5/8/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

IMU SHIPPING
CONTAINER, REUSABLE

CODE IDENT NO.
SIZE D
1900010
SCALE 1:8
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

Apollo G&N Specification
PS-1900010-C

Class BRelease
TDRR 01421

PROCUREMENT SPECIFICATION
FOR
IMU CONTAINER, SHIPPING, REUSABLE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01421 **DATE** 20 May 1963

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	01421	Completely revised/MXC-186576			5-16-63
B	10616	Retyped 5,48 and 12, was 15 pages now 14, 1, 4, 5, 8, 9, 12, 13 &			7-19-63
		14 revised / MXC-188336			
C	10617	i and 1 through 14/MXC-191629			

This specification consists of page i to iii and 1 to 14 inclusive.

Apollo G&N Specification
PS-1900010-C
29 May 1963
Class B Release
TDRR [illegible]

PROCUREMENT SPECIFICATION FOR IMU CONTAINER, SHIPPING, REUSABLE

1. This specification establishes the requirements for the design and construction of a reusable IMU Shipping Container.

2. Recommendations for correction, additions, or deletions should be reported to the Apollo Management Office, Massachusetts Institute of Technology, 75 Cambridge Parkway, Cambridge 42, Massachusetts.

Walker S. Kupfer 29 May 1963
MIT INSTRUMENTATION LABORATORY

Jack Barnard 5/29/63
NASA/MSC APPROVAL

PREPARED BY	TITLE	DATE
E. Armstrong AC Spark Plug	Spec. Engrg. Writer	12 April 1963
EXAMINED BY	TITLE	DATE
AC Spark Plug	APOLLO GSE Section Head	29 April 1963
APPROVED BY	TITLE	DATE
J.P. Gilmore MIT/GSE MIT/IL		5-28-63
APPROVED BY	TITLE	DATE
MIT/IL		
APPROVED BY	TITLE	DATE
MIT/IL		

PROCUREMENT SPECIFICATION

FOR

IMU CONTAINER, SHIPPING, REUSABLE

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of IMU Container,Shipping, Reusable, hereafter called the container.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of invitations for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-P-116	Preservation, Methods of
MIL-E-4158C	Electronic Equipment Ground: General Requirements for
MIL-E-4970A	Environmental Testing, Ground Support Equipment, General Specification for
MIL-I-6865	Inspection, Radiographic
MIL-I-6866	Inspection, Penetrant Method of
MIL-F-14072	Finishes for Ground Signal Equipment
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of
MIL-P-26514	Polyurethane Foam, Rigid or Elastic, for Packaging
MIL-W-27076	Workmanship Standards for Ground Electronic and Associated Equipment

Apollo G&N Specification
PS-1900010- C

Class BRelease
TDRR 01421

PROCUREMENT SPECIFICATION
FOR
IMU CONTAINER, SHIPPING, REUSABLE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01421 **DATE** 29 May 1963

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	01421	Completely revised/MXC-186576			5-16-63
B	10616	Retyped 5,48 and 12, was 15 pages now 14, 1, 4, 5, 8, 9, 12, 13 & 14 revised / MXC-188336			7-19-63
Ⓜ C	10617	i and 1 through 14/MXC-191629			

This specification consists of page i to iii and 1 to 14 inclusive.

PREPARED BY	TITLE	DATE
E. Armstrong	Spec. Engrg. Writer	12 April 1963
AC Spark Plug		
EXAMINED BY	TITLE	DATE
	APOLLO GSE Section Head	29 April 1963
AC Spark Plug		
APPROVED BY	TITLE	DATE
J.P. Gilmore MIT/GSE		5-28-63
MIT/IL		
APPROVED BY	TITLE	DATE
MIT/IL		
APPROVED BY	TITLE	DATE
MIT/IL		

APOLLO G&N

ND-1002018	General Specification for APOLLO Ground Support Equipment
ND-1002019	Marking
ND-1002023	Procedure for Serialization of Components, Assemblies, etc. for APOLLO Guidance Navigation Equipment
ND-1015404	General Specification, Configuration, Process and Quality Control Requirements for Suppliers of High Reliability Articles for Use in Spacecraft and Supporting Equipment

STANDARDS

Military

MIL-STD-210	Climatic Extremes for Military Equipment

DRAWINGS

APOLLO G&N

1000201	Inertial Measurement Unit Assembly
1016194	Cashmere Blue Enamel
1900010	IMU Container, Shipping, Reusable

OTHER PUBLICATIONS

United States Department of Commerce, National Bureau of Standards

Handbook H28	Screw-Thread Standards for Federal Services (1957) with Supplement (1950)

3. REQUIREMENTS

The requirements of this specification are classified under two headings:

General Requirements, which are mandatory requirements to be fulfilled by the contractor, are defined in paragraph 3.2.

Performance and Product Characteristics, which are not necessarily mandatory, are defined in paragraph 3.3.

3.1 DESCRIPTION. The container shall provide environmental control, shock, and vibration isolation for the Inertial Measurement Unit (IMU) during transportation and temporary storage. A heating system shall maintain the thermal environment as specified herein after external electrical power is removed.

3.2 GENERAL REQUIREMENTS

3.2.1 Qualification and Requalification Testing. This specification makes provisions for qualification and requalification testing.

3.2.2 Materials and Construction

3.2.2.1 Materials. The materials used in fabricating the container shall be in strict accordance with the applicable drawings and specifications referenced herein. Substitute materials and/or processes shall be selected of such quality as to ensure that the equipment will meet the requirements of this specification and shall be subject to prior approval of the procuring activity.

3.2.2.2 Construction. The construction of the container shall be in accordance with Drawings 1900010 and 1000201 and all applicable drawings and specifications listed thereon.

3.2.3 Weight, Dimensions, Finish and Color

3.2.3.1 Weight. The gross weight of the container without an IMU installed shall not exceed 300 pounds.

3.2.3.2 Dimensions. The exterior dimensions of the container shall be in accordance with the applicable drawings and the following:

a. Length - 34 inches max
b. Width - 34 inches max
c. Height - 40 inches max

3.2.3.3 Finish and Color. Exterior metal surfaces shall be treated and finished in accordance with the requirements of Specification MIL-F-14072. Coloring shall be in accordance with Drawing 1016194.

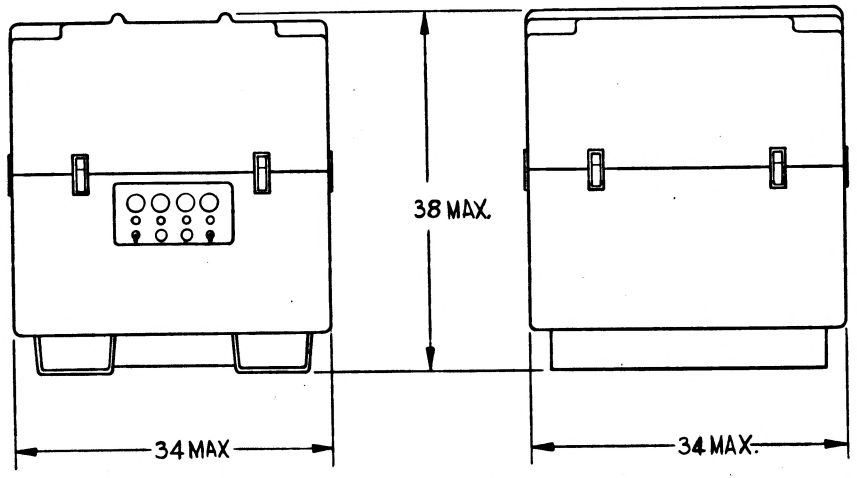
a 0100061 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		(1) REPLACE REV A WITH CHANGE (2) ADDED PICTURE, REQUIREMENTS AND VENDOR (3) WAS C SIZE DWG (4) TITLE WAS "IMU SHIPPING CONTAINER"	D.O. 51453	16 APR 63	
C		TITLE WAS "IMU CONTAINER, SHIPPING AND TRANSFER, REUSABLE".		7 MAY 63	WK
C1	—	CHANGE IN ACCORDANCE WITH MXC- 186575	—	23 MAY 63	M.G. RWH
D		INCORPORATES C1 CHANGE PER TDRR 03720	—	9 SEPT 63	8 OCT 63 WK

REQUIREMENTS:

PROCUREMENT SPECIFICATION PS-1900010

PICTURE INCOMPLETE



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01212 **DATE** 8 May 63

(B) REPLACES REV A WITH CHANGE

QUALIFIED VENDOR:

CRYO-THERM, INC
FOGELSVILLE, PENNSYLVANIA

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	011

APPLICATION

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DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+2	+ —	+ —
-2	— —	— —

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9- 497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19 MAR 63
CHECKED MALIKOWSKI 25 MAR 63
APPROVAL A.M. BRAY 25 MAR 63
APPROVAL A.J. KODEL 25 MAR 63
NASA APPROVAL 5/8/63
L. Gedeman 5/8/63
MIT APPROVAL 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

IMU CONTAINER,
SHIPPING, REUSABLE

CODE IDENT NO.
SIZE D
1900010
SCALE 1:8
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

3 | 0100061

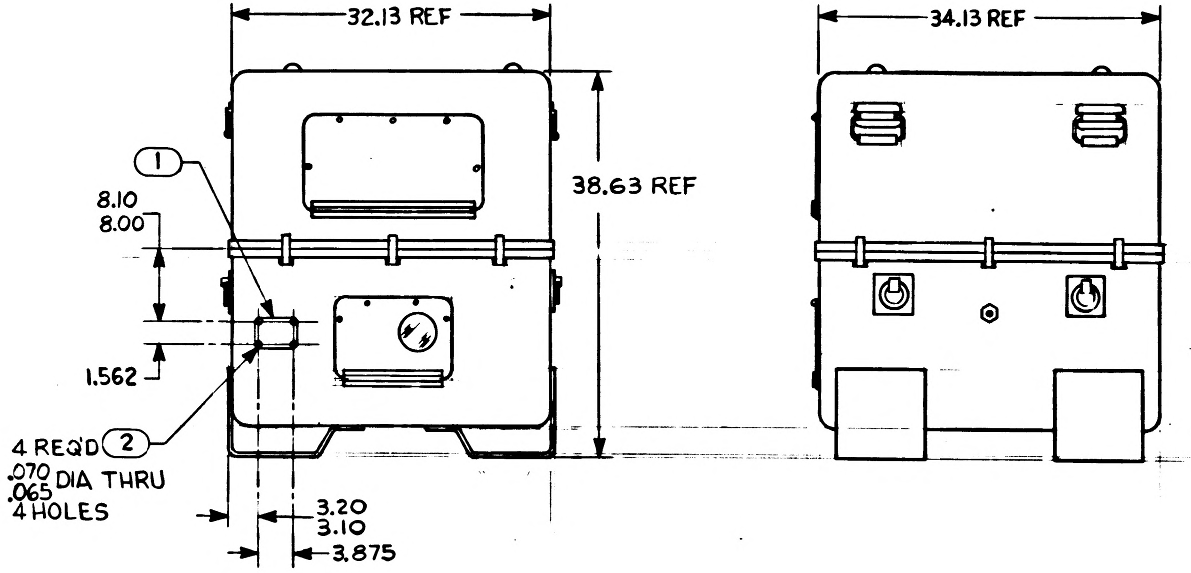
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		(1) REPLACE REV A WITH CHANGE (2) ADDED PICTURE, REQUIREMENTS AND VENDOR (3) WAS C SIZE DWG (4) TITLE WAS "IMU SHIPPING CONTAINER"	D.O. 51453	16 APR 63	
C		TITLE WAS "IMU CONTAINER, SHIPPING AND TRANSFER, REUSABLE."		7 MAY 63	
C1	—	CHANGE IN ACCORDANCE WITH MXC-186575	—	23 MAY 63	M.G. RWH
D		INCORPORATES C1 CHANGE PER TDRR 03720	—	9 SEPT 63	
E		CHANGE IN ACCORDANCE WITH CM 195415 PER TDRR 08093		5 MAR 64	

REQUIREMENTS:

PROCUREMENT SPECIFICATION PS-1900010

NOTES:

1. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. ON ITEM ① IN ACCORDANE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01212 **DATE** 8 May 63

Ⓑ REPLACES REV A WITH CHANGE

QUALIFIED VENDOR:

CRYO-THERM INC
FOGELSVILLE, PENNSYLVANIA

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4		2	AN535-0-3	(1897109-103) SCREW-DRIVE
1		1	1901304-207	NAMEPLATE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	011

APPLICATION

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DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS ±.02 ±.005 ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19 MAR 63
CHECKED MALIKOWSKI 25 MAR 63
APPROVAL A.M. BRAY 25 MAR 63
APPROVAL A.J. KODEL 25 MAR 63
NASA APPROVAL L Gdiman 5/8/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

IMU CONTAINER,
SHIPPING, REUSABLE

CODE IDENT NO. SIZE D 1900010
SCALE NONE SHEET

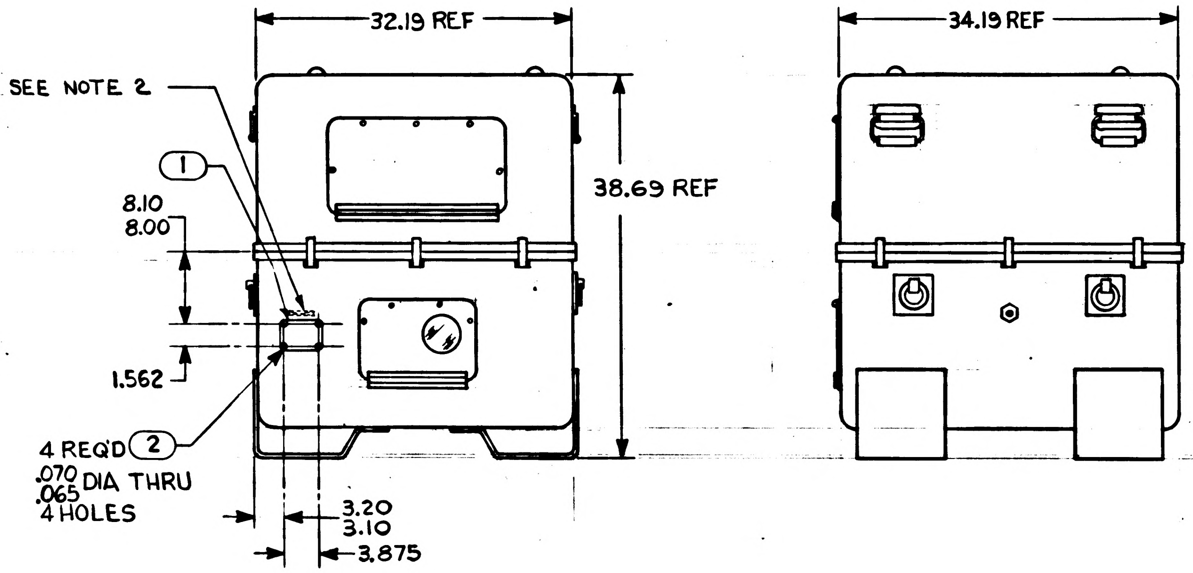
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		(1) REPLACE REV A WITH CHANGE (2) ADDED PICTURE, REQUIREMENTS AND VENDOR (3) WAS C SIZE DWG (4) TITLE WAS "IMU SHIPPING CONTAINER"	D.O. 51453	16 APR 63	
C		TITLE WAS "IMU CONTAINER, SHIPPING AND TRANSFER, REUSABLE."		7 MAY 63	WK
C1	—	CHANGE IN ACCORDANCE WITH MXC-186575	—	23 MAY 63	M.G. RWH
D		INCORPORATES C1 CHANGE PER TDRR 03720	—	9 SEPT 63	8 Oct 63 WK
E		CHANGE IN ACCORDANCE WITH CM 195415 PER TDRR 08093		5 MAR 64	EF
F		CHANGE IN ACCORDANCE WITH CM 197505 PER TDRR 10836	—	8 JUNE 64	JB MEM

REQUIREMENTS:

PROCUREMENT SPECIFICATION PS-1900010

NOTES:

1. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. ON ITEM ① IN ACCORDANE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
2. MARK APPLICABLE REVISION LETTER "DWG REV LTR __" PER ND1002019, .12 HIGH, COLOR BLACK, CENTRALIZE .12 ABOVE ITEM 1.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01212 DATE 8 May 63

Ⓑ REPLACES REV A WITH CHANGE

QUALIFIED VENDOR:

CRYO-THERM, INC
FOGELSVILLE, PENNSYLVANIA

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		5	1900509	CABLE ASSEMBLY
REF.		4	1900506	SCHEMATIC DIAGRAM, ELECT., CONTAINER ASSY
1		3	1900500-011	CONTAINER ASSEMBLY
4		2	AN535-0-3	(1897109-103) SCREW-DRIVE
1		1	1901304-207	NAMEPLATE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	011

APPLICATION

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + —— − ——
DECIMALS ±.02 ±.005
ANGLES + —— − ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19 MAR 63
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NASA APPROVAL 5/8/63
L Gideman 5/8/63
MIT APPROVAL 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

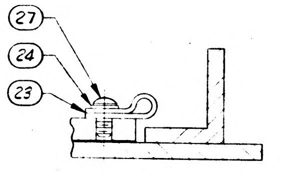
IMU CONTAINER,
SHIPPING, REUSABLE

CODE IDENT NO.
SIZE D
1900010
SCALE NONE
SHEET

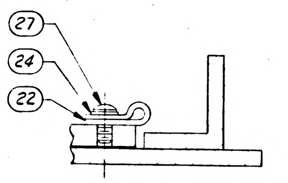
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2.
3
4 VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52 OR ITEM 73.
6 ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE(+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 OR ITEM 76 OR ITEM 78 IN ACCORDANCE WITH ND 1002023, LETTERS AND NUMERALS TO BE .12 HIGH.
9. MARK APPLICABLE REVISION LETTER (REV) PER ND 1002012, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.

REVISIONS

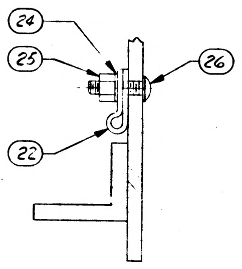
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
K		ADDED SHEET-2 REPLACES REV "J" WITH CHANGE PER MXC 190348 REVISED PER TDR		15 OCT 63	RW
L		CHANGE IN ACCORDANCE WITH MXC-190602		20 DEC 63	J.E.L.
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
N		CHANGE IN ACCORDANCE WITH MXC-191345		27 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764		30 DEC 63	J.E.L.
R		CHANGE IN ACCORDANCE WITH MXC-192010		3 JAN 64	J.E.L.
S		CHANGE IN ACCORDANCE WITH MXC-192495		6 JAN 64	J.E.L.
T		CHANGE IN ACCORDANCE WITH [illegible]		7 JAN 64	J.E.L.
U		CHANGE IN ACCORDANCE WITH CM 195054		27 FEB 64	
V		CHANGE IN ACCORDANCE WITH CM 196083		16 MAR 64	
W		196168 [illegible] 8220		27 MAR 64	JK
Y		REVISED PER TDRR 11569		25 AUG 64	JWP
Z		REVISED AND UPGRADED TO CLASS A PER TDRR 17587		4 MAR 65	FM
AA		REVISED PER TDRR 25897		15 FEB 66	RP J.E.G.



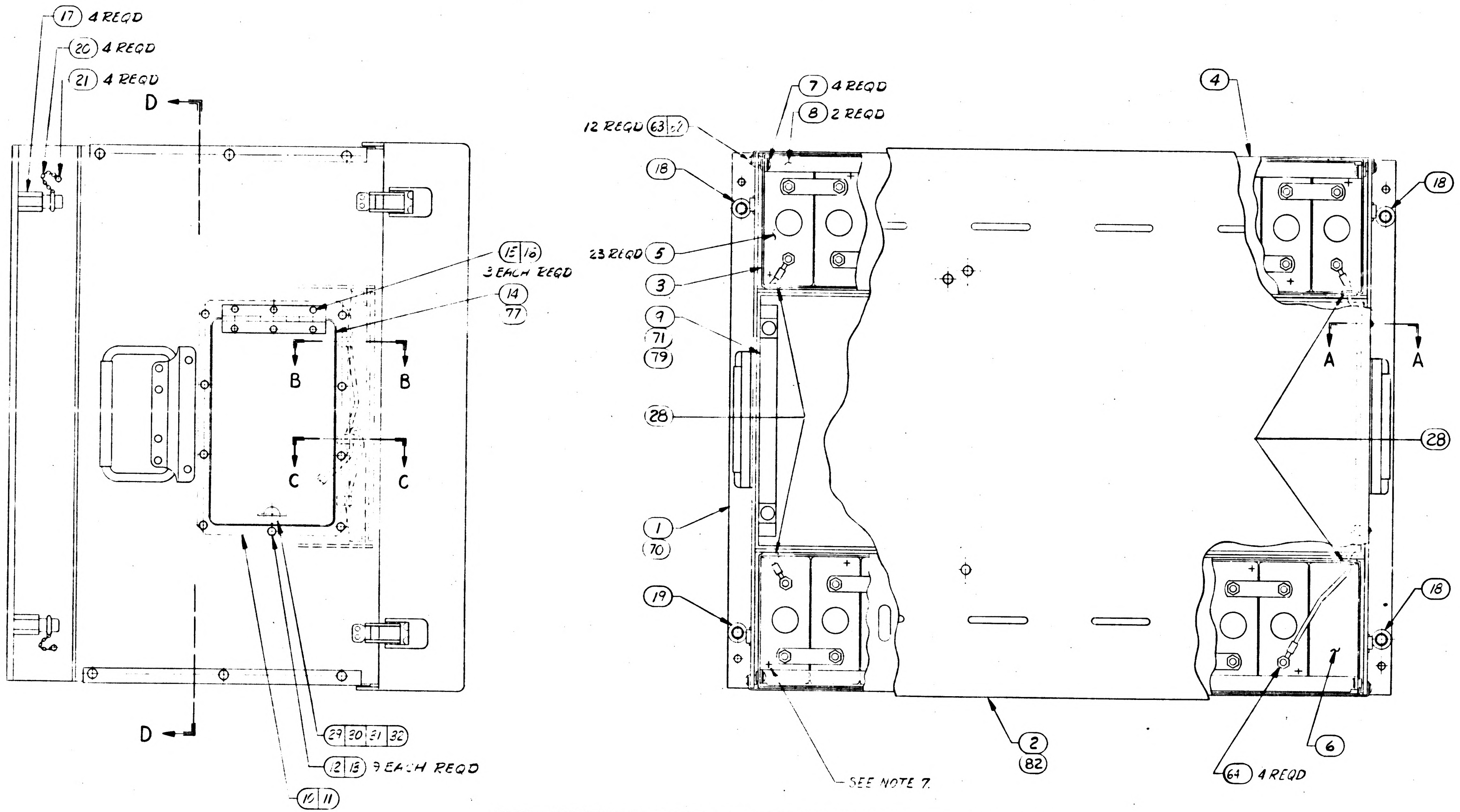
PARTIAL SECTION C-C
SCALE 2:1



PARTIAL SECTION B-B
TWO PLACES
SCALE 2:1



PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1



			021	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1	—	—		82	1902541	COVER, BATTERY POWER PACK
		X	—	—		81	1902537	WIRING DIAGRAM
		X	—	—		80	1902538	SCHEMATIC
		1	—	—		79	1902249-021	PANEL ASSEMBLY
		1	—	—		78	1004260-159	NAMEPLATE
		1	1	-		77	1902140	DOOR, ACCESS (INSEP ASSY)
		—	1	-		76	1901304-236	NAMEPLATE
		—	X	-		75	1902192	WIRING DIAGRAM
		1	1	-		74	1902189	WIRE LIST B-B
		1	1	-		73	1902188	WIRING HARNESS B
		—	X	-		72	1902178	SCHEMATIC DIAGRAM, ELECTRICAL
		—	1	-		71	1902249-011	PANEL ASSEMBLY
		1	1	-		70	1902123	CASE, BATTERY POWER PACK
		1	1	-		69	RE75G1R00	(1896992-097) RESISTOR MIL-R-18546/1
		1	1	-		68	RE75GR715	(1896992-093) RESISTOR MIL-R-18546/1
		4	4	-		67	1016151-004	NUT, SELF LOCKING
		4	4	—		66	AN505C-4R-10	SCREW, MACHINE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

		031	021	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		4	4	4		65	AN960-C416	1897006-042 WASHER, FLAT
SEE NOTE 4		4	4	4		64	1015902-50	TERMINAL LUG
SEE NOTE 4		12	12	12		63	1006783-43	SCREW, MACHINE
		12	12	12		62	AN960-C10L	(1897006-017) WASHER - FLAT
SEE NOTE 4&5		1	1	1		61	1015818-90	CONNECTOR
		1	1	1		60	1900955	CABLE, ELEC., INTERCONNECT, W100 (PPP TO PTC)
		1	1	1		59	1900954	CABLE, ELEC., INTERCONNECT, W101 (PPP TO IMU)
		4	4	4		58	AN535-0-3	(1897109-103) SCREW, DRIVE
		—	—	1		57	1901304-208	NAMEPLATE
		4	4	4		56	1006873-27	SCREW, MACHINE
		1	1	1		55	MS3105-32	DUMMY RECEPTACLE
		—	—	X		54	1900559	WIRING DIAGRAM
		—	—	1		53	1900903	WIRE LIST BB
		—	—	1		52	1900923	WIRING HARNESS B
		—	—	X		51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
		4	4	4		50	AN335-4	NUT, PLAIN HEX
		10	10	10		49	AN363C428	NUT, SELF-LOCKING
		11	11	11		48	AN363C1032	NUT, SELF-LOCKING
		20	20	20		47	1006783-19	SCREW, MACHINE
		4	4	4		46	1006783-57	SCREW, MACHINE
		9	9	9		45	1006783-44	SCREW, MACHINE
SEE NOTE 4		2	2	2		44	1015826-407	SCREW, MACHINE
SEE NOTE 4		4	4	4		43	1015826-411	SCREW, MACHINE
SEE NOTE 4		2	2	2		42	1015826-304	SCREW, MACHINE
		4	4	4		41	MS35338-82	WASHER, LOCK
SEE NOTE 4		7	7	7		40	1016105-004	CLAMP
SEE NOTE 4		1	1	1		39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4		1	1	1		38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4		3	3	3		37	1016073-123	DUMMY RECEPTACLE
		1	1	1		36	1900158	INVERTER, STATIC
SEE NOTE 4		1	1	1		35	1015953	TRANSFORMER, POWER
		1	1	1		34	1900795	BRACKET, TRANSFORMER HOLD DOWN
		1	1	1		33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4		1	1	1		32	1016062-001	WASHER, WEAR
SEE NOTE 4		1	1	1		31	1016060-017	STUD, WING HEAD
SEE NOTE 4		1	1	1		30	1016061-001	SPRING, EJECTOR
SEE NOTE 4		1	1	1		29	1015857-1	WASHER, RETAINER
		4	4	4		28	MS35489-6	GROMMET, RUBBER
SEE NOTE 4		3	3	3		27	1006783-18	SCREW, MACHINE
		2	2	2		26	1006783-20	SCREW, MACHINE
SEE NOTE 4		22	22	22		25	1016151-004	NUT, SELF-LOCKING
		5	5	5		24	AN960-C4L	WASHER, FLAT
SEE NOTE 4		1	1	1		23	1015985-201	CABLE CLAMP
SEE NOTE 4		4	4	4		22	1015985-203	CABLE CLAMP
		4	4	4		21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4		4	4	4		20	1016067-003	CHAIN SAFETY
SEE NOTE 4		1	1	1		19	1016065-013	PIN, QUICK RELEASE
SEE NOTE 4		3	3	3		18	1016065-011	PIN, QUICK RELEASE
		4	4	4		17	1900773	RETAINER, PIN
		3	3	3		16	AN363C632	NUT, SELF-LOCKING
		3	3	3		15	1006783-24	SCREW, MACHINE
		—	—	1		14	1900471	DOOR, ACCESS (INSEP) ASSY
		13	13	13		13	AN363C832	NUT, SELF-LOCKING
		9	9	9		12	1006783-28	SCREW, MACHINE
		1	1	1		11	1900818	GASKET, BACK PLATE (RFI)
		1	1	1		10	1900472	BACKPLATE (INSEP) ASSY
		—	—	1		9	1900473-011	PANEL ASSY
		2	2	2		8	1900822	CLAMP, BATTERY
		4	4	4		7	1006783-42	SCREW, MACHINE
		1	1	1		6	1015972-002	DUMMY CELL
		23	23	23		5	1015972-001	CELL, NICKEL CADMIUM
		2	2	2		4	1900464	BATTERY COVER (INSEP) ASSY
		2	2	2		3	1900461	BATTERY CASE (INSEP) ASSY
		—	1	1		2	1900460	COVER, BATTERY POWER PACK
		—	—	1		1	1900456	CASE, BATTERY POWER PACK

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

1900011 AA

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900342-011	1900342-011	031
1900011-021		021
1900011-011	1900030-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

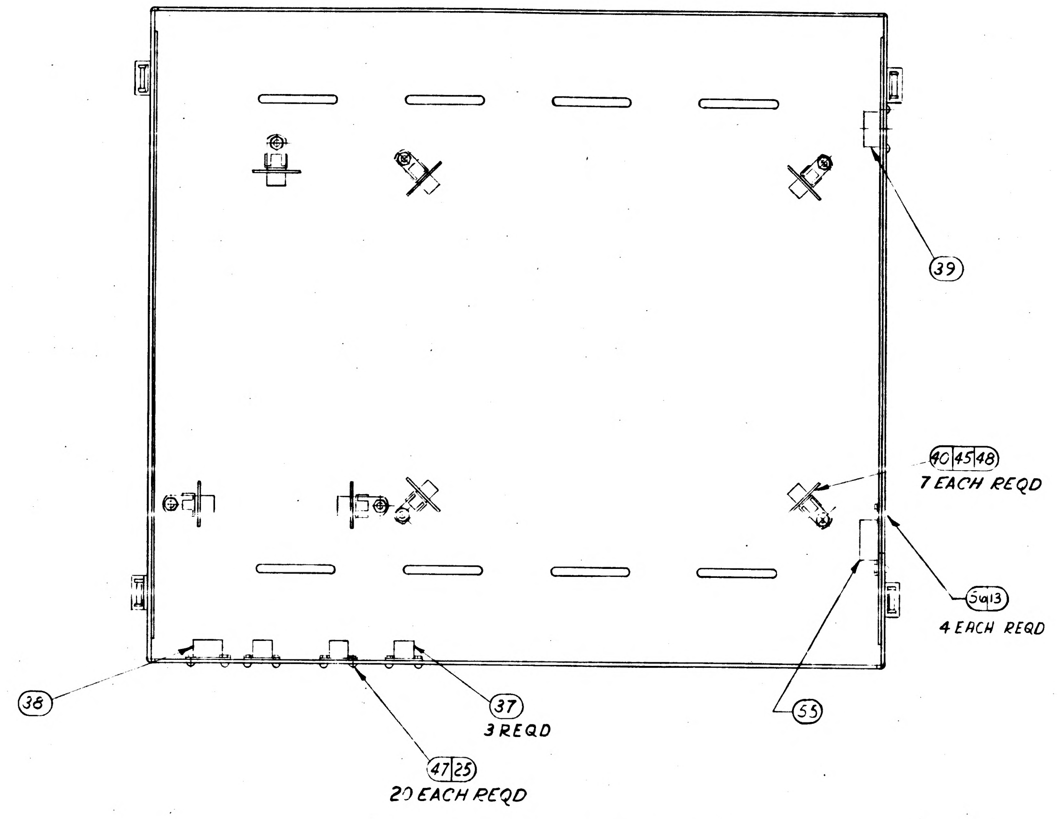
AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE, WIS.
DRAWN SCHMIER DATE 4 SEP 63
CHECKED WILSON 19 SEP 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

BATTERY POWER PACK
ASSEMBLY

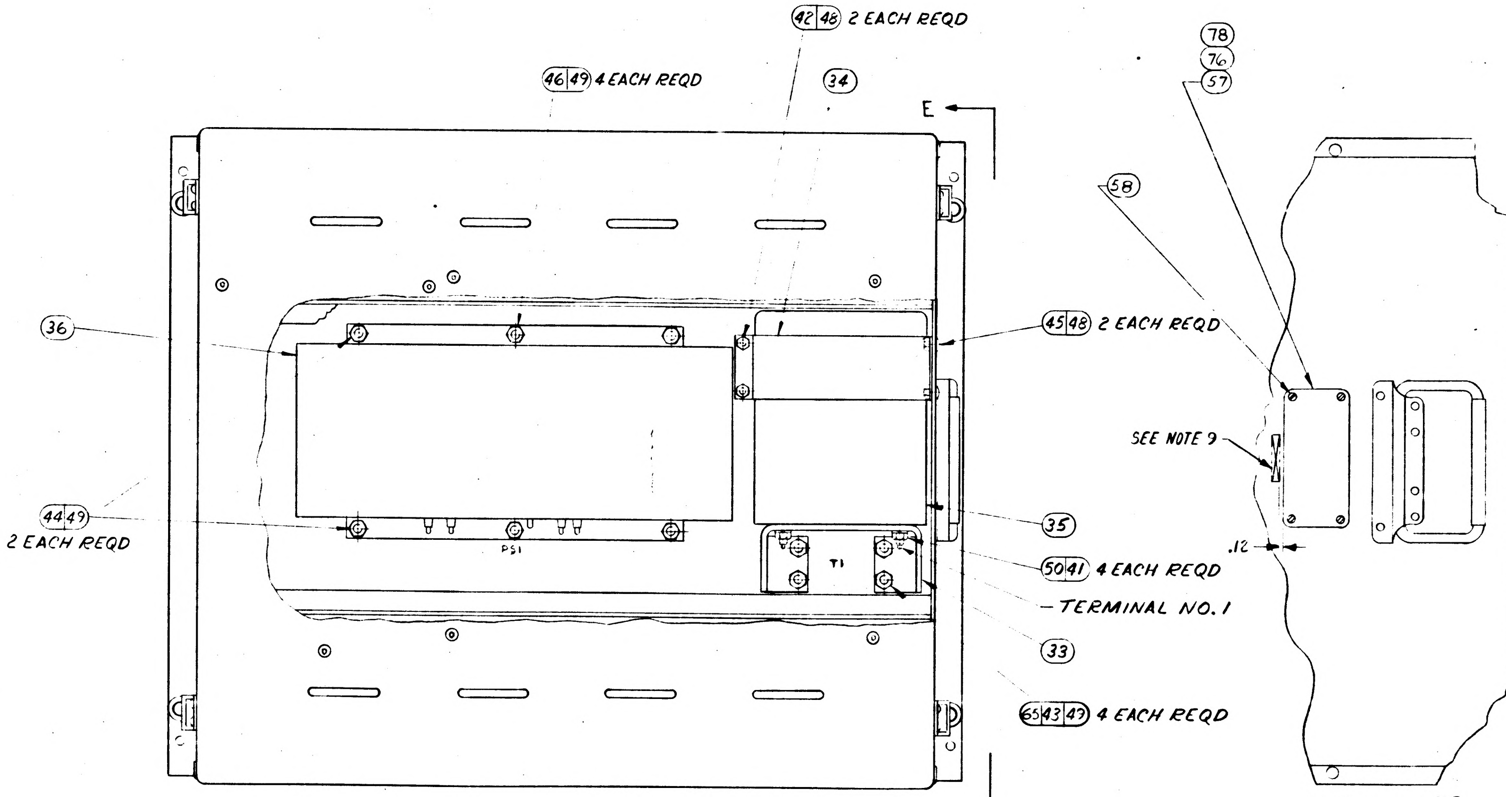
CODE IDENT NO
SIZE E
1900011
SCALE 2:2
SHEET 1 OF 2

REV	ZONE	DESCRIPTION	CHG NO	DATE	APPD
K		REPLACES REV "J" WITH CHANGE PER MXC 190348 REVISED PER TDR CC-85		65	
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764 PER TDRR CC-91		30 DEC	J.E.L.
W		CN 196-64 [illegible] 20		27 MAR	J.E.
Y		REVISED PER TDRR 11569		25 AUG	JWP
Z		REVISED AND UPGRADED TO CLASS A PER TDRR 17587		24 MAR 65	
AA		REVISED PER TDRR 25897		5 FEB 66	J.E.G.



39
40 45 48 7 EACH REQD
5 9 13 4 EACH REQD
38
37 3 REQD
55
47 25 20 EACH REQD

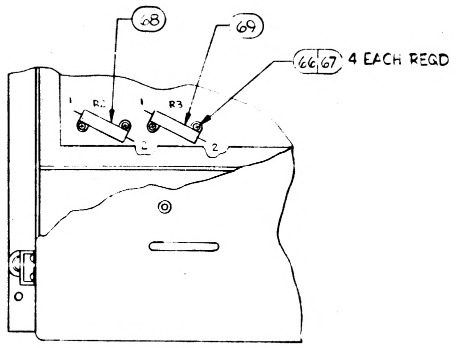
INSIDE VIEW OF COVER ITEM 2 (REF)



42 48 2 EACH REQD
46 49 4 EACH REQD
34
E
E
36
44 49 2 EACH REQD
PS1
T1
45 48 2 EACH REQD
35
50 41 4 EACH REQD
-TERMINAL NO. 1
33
65 43 47 4 EACH REQD
78
76
57
58
SEE NOTE 9
.12

PARTIAL VIEW D-D

PARTIAL VIEW E-E



68
69
66 67 4 EACH REQD
R2
R3
1
2

DETAIL SHOWING MOUNTING OF ITEMS 68 AND 69

-021 CONFIGURATION ONLY

THIS SHEET ADDED

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC ELECTRONICS DIVISION
DRAWN 9 SEP 63
CHECKED WILSON 18 SEP 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

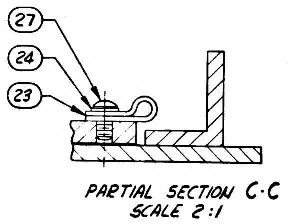
BATTERY POWER PACK
ASSEMBLY

CODE IDENT NO
SIZE E
1900011
SCALE 1:2
SHEET 2 OF 2

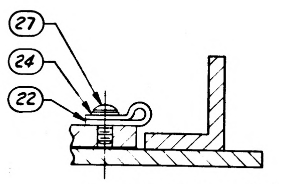
1900011 AA

1900011
SHT 2

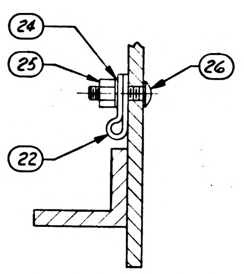
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2.
3.
4. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52 OR ITEM 73.
6. ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE(+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 OR ITEM 76 OR ITEM 78 IN ACCORDANCE WITH ND 1002023, LETTERS AND NUMERALS TO BE .12 HIGH.
9. MARK APPLICABLE REVISION LETTER (REV) PER ND 1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.



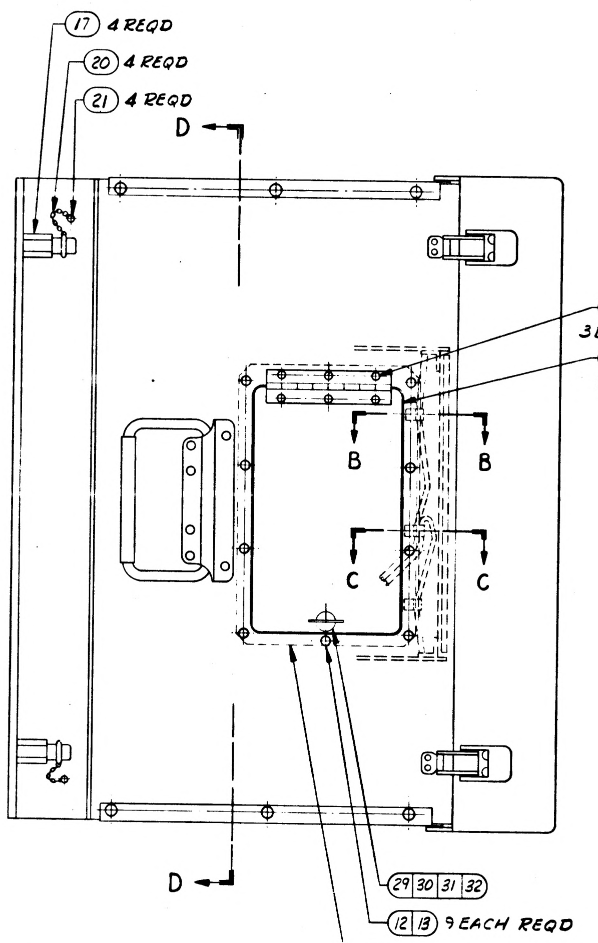
PARTIAL SECTION C-C
SCALE 2:1

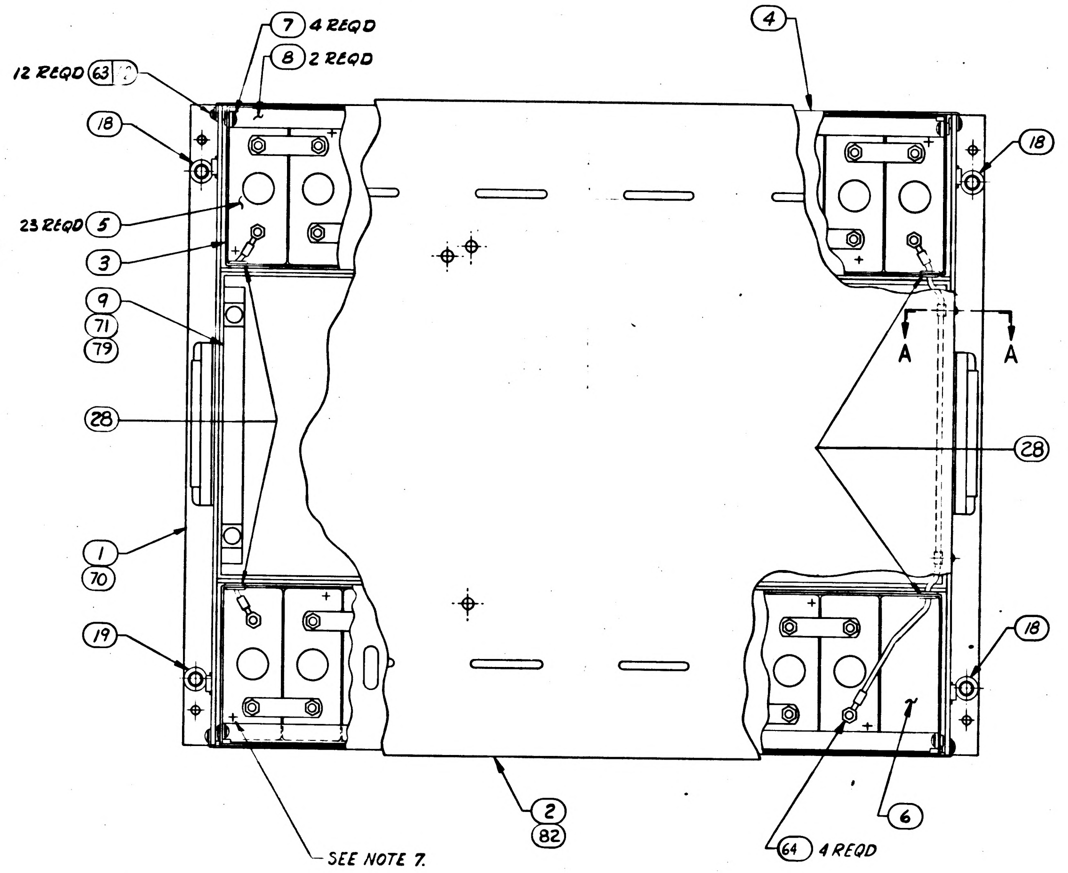


PARTIAL SECTION B-B
TWO PLACES
SCALE 2:1



PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1





	1	—	—		82	1902541	COVER, BATTERY POWER PACK
	X	—	—		81	1902537	WIRING DIAGRAM
	X	—	—		80	1902538	SCHEMATIC
	1	—	—		79	1902249-021	PANEL ASSEMBLY
	1	—	—		78	1004260-159	NAMEPLATE
	1	1	-		77	1902140	DOOR, ACCESS (INSEP ASSY)
	—	1	-		76	1901304-236	NAMEPLATE
	—	X	-		75	1902192	WIRING DIAGRAM
	1	1	-		74	1902189	WIRE LIST B-B
	1	1	-		73	1902188	WIRING HARNESS B
	—	X	-		72	1902138	SCHEMATIC DIAGRAM, ELECTRICAL
	—	1	-		71	1902249-011	PANEL ASSEMBLY
	1	1	-		70	1902128	CASE, BATTERY POWER PACK
	1	1	-		69	RE75G1R00	(1896982-097) RESISTOR MIL-R-185 46/1
	1	1	-		68	RE75GR715	(1896982-083) RESISTOR MIL-R-185 46/1
	4	4	-		67	1016151-004	NUT, SELF LOCKING
	4	4	—		66	AN505C-4R-10	SCREW, MACHINE
	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

	4	4	4		65	AN960-C416	1897006-042 WASHER, FLAT
SEE NOTE 4	4	4	4		64	1015902-50	TERMINAL LUG
SEE NOTE 4	12	12	12		63	1006783-43	SCREW, MACHINE
	12	12	12		62	AN 960-C10L	(1897006-017) WASHER - FLAT
SEE NOTE 4&5	1	1	1		61	1015818-90	CONNECTOR
	1	1	1		60	1900955	CABLE, ELEC, INTERCONNECT, W100 (BPP TO PTC)
	1	1	1		59	1900954	CABLE, ELEC., INTERCONNECT, W101 (BPP TO IMU)
	4	4	4		58	AN535-0-3	(1897109-103) SCREW, DRIVE
	—	—	1		57	1901304-208	NAMEPLATE
	4	4	4		56	1006783-27	SCREW, MACHINE
	1	1	1		55	MS3105-32	DUMMY RECEPTACLE
	—	—	X		54	1900559	WIRING DIAGRAM
	—	—	1		53	1900903	WIRE LIST BB
	—	—	1		52	1900923	WIRING HARNESS B
	—	—	X		51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
	4	4	4		50	AN335-4	NUT, PLAIN HEX
	10	10	10		49	AN363C428	NUT, SELF-LOCKING
	11	11	11		48	AN363C1032	NUT, SELF-LOCKING
	20	20	20		47	1006783-19	SCREW, MACHINE
	4	4	4		46	1006783-57	SCREW, MACHINE
	9	9	9		45	1006783-44	SCREW, MACHINE
SEE NOTE 4	2	2	2		44	1015826-407	SCREW, MACHINE
SEE NOTE 4	4	4	4		43	1015826-411	SCREW, MACHINE
SEE NOTE 4	2	2	2		42	1015826-304	SCREW, MACHINE
	4	4	4		41	MS35338-82	WASHER, LOCK
SEE NOTE 4	7	7	7		40	1016105-004	CLAMP
SEE NOTE 4	1	1	1		39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4	1	1	1		38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4	3	3	3		37	1016073-123	DUMMY RECEPTACLE
	1	1	1		36	1900158	INVERTER, STATIC
SEE NOTE 4	1	1	1		35	1015953	TRANSFORMER, POWER
	1	1	1		34	1900795	BRACKET, TRANSFORMER HOLD DOWN
	1	1	1		33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4	1	1	1		32	1016062-001	WASHER, WEAR
SEE NOTE 4	1	1	1		31	1016060-017	STUD, WING HEAD
SEE NOTE 4	1	1	1		30	1016061-001	SPRING, EJECTOR
SEE NOTE 4	1	1	1		29	1015857-1	WASHER, RETAINER
	4	4	4		28	MS 35489-6	GROMMET, RUBBER
SEE NOTE 4	3	3	3		27	1006783-18	SCREW, MACHINE
	2	2	2		26	1006783-20	SCREW, MACHINE
SEE NOTE 4	22	22	22		25	1016151-004	NUT, SELF-LOCKING
	5	5	5		24	AN960-C4L	WASHER, FLAT
SEE NOTE 4	1	1	1		23	1015985-201	CABLE CLAMP
SEE NOTE 4	4	4	4		22	1015985-203	CABLE CLAMP
	4	4	4		21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4	4	4	4		20	1016067-003	CHAIN SAFETY
SEE NOTE 4	1	1	1		19	1016065-013	PIN, QUICK RELEASE
SEE NOTE 4	3	3	3		18	1016065-011	PIN, QUICK RELEASE
	4	4	4		17	1900773	RETAINER, PIN
	3	3	3		16	AN363C632	NUT, SELF-LOCKING
	3	3	3		15	1006783-24	SCREW, MACHINE
	—	—	1		14	1900471	DOOR, ACCESS (INSEP) ASSY
	13	13	13		13	AN363C832	NUT, SELF-LOCKING
	9	9	9		12	1006783-28	SCREW, MACHINE
	1	1	1		11	1900818	GASKET, BACKPLATE (RFI)
	1	1	1		10	1900472	BACKPLATE (INSEP) ASSY
	—	—	1		9	1900473-011	PANEL ASSY
	2	2	2		8	1900822	CLAMP, BATTERY
	4	4	4		7	1006783-42	SCREW, MACHINE
	1	1	1		6	1015972-002	DUMMY CELL
	23	23	23		5	1015972-001	CELL NICKEL CADMIUM
	2	2	2		4	1900464	BATTERY COVER (INSEP) ASSY
	2	2	2		3	1900461	BATTERY CASE (INSEP) ASSY
	—	1	1		2	1900460	COVER, BATTERY POWER PACK
	—	—	1		1	1900456	CASE, BATTERY POWER PACK
	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
K		ADDED SHEET-2 REPLACES REV. "J" WITH CHANGE PER MXC 19C348 REVISED PER TDR 06215		9 OCT 63	
L		CHANGE IN ACCORDANCE WITH MXC-190602		26 DEC 63	J.E.L.
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
N		CHANGE IN ACCORDANCE WITH MXC-191345		27 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764		30 DEC 63	J.E.L.
R		CHANGE IN ACCORDANCE WITH MXC-192010		3 JAN 64	J.E.L.
S		CHANGE IN ACCORDANCE WITH MXC-192485		6 JAN 64	J.E.L.
T		CHANGE IN ACCORDANCE WITH CM 192150 PER TDRR 06291		7 JAN 64	J.E.L.
U		CHANGE IN ACCORDANCE WITH CM 195054		24 FEB 64	
V		CHANGE IN ACCORDANCE WITH CM 96083		6 MAR 64	
W		CHANGE IN ACCORDANCE WITH CM 196168 PER TDRR 08220		27 MAR 64	J.K.
Y		REVISED PER TDRR 11569		25 AUG 64	
Z		REVISED AND UPGRADED TO CLASS A PER TDRR 17587		24 MAR 65	
AA		REVISED PER TDRR 25897		5 FEB 66	J.E.S.
AB		REVISED PER TDRR 25902		7 FEB 66	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900342-011	1900342-011	031
1900011-021		021
1900011-011	1900030-011	011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

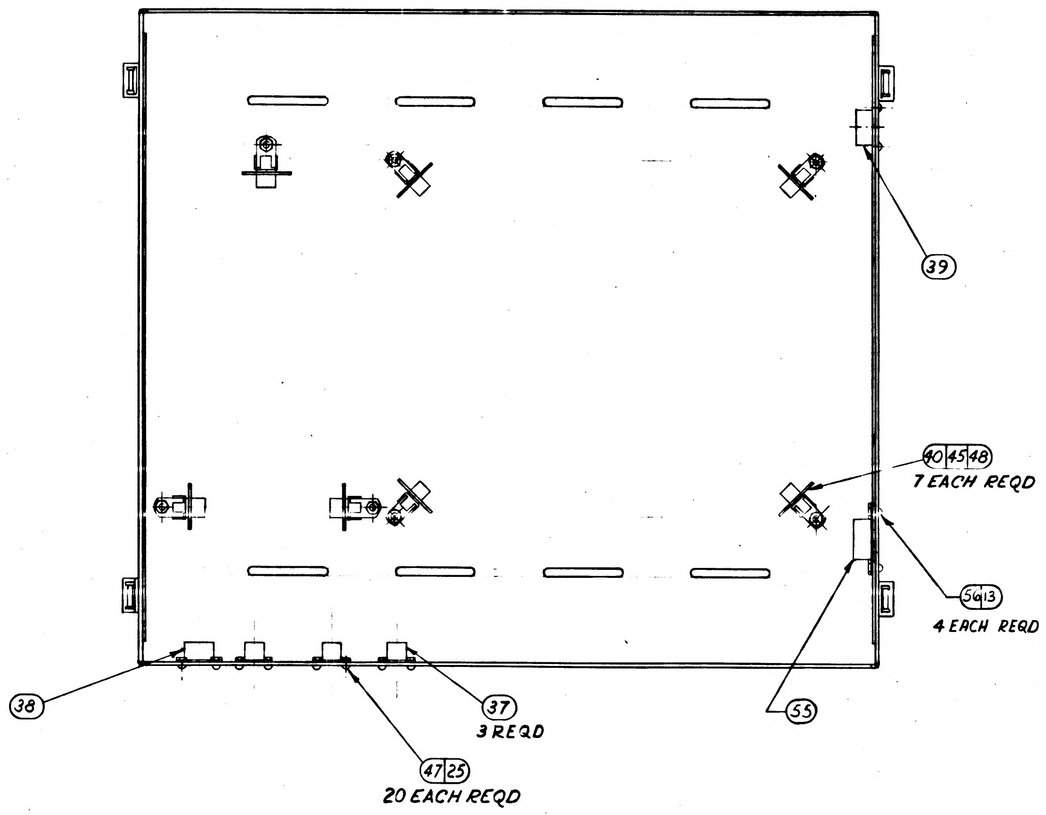
AC ELECTRONICS DIVISION
GENERAL MOTORS CORP MILWAUKEE WIS
DRAWN SOMMER DATE 9 SEP 63
CHECKED WILSON 18 SEP 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

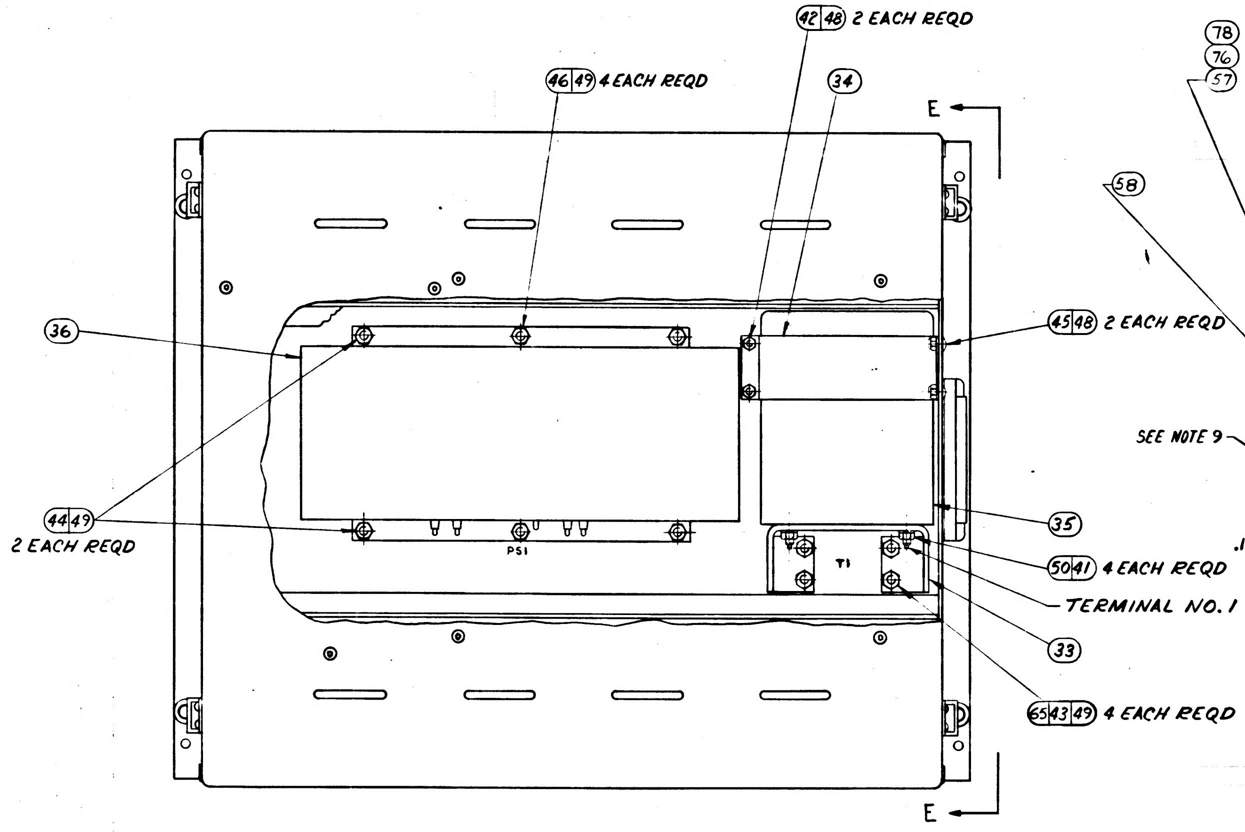
CODE IDENT NO | SIZE E | 1900011
SCALE 1:2 | SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
K		REPLACES REV."J" WITH CHANGE PER MXC 90348 REVISED PER TDR 06285		63 38	
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764 PER TDRR 06291		30 DEC 63	J.E.L.
W		CHANGE IN ACCORDANCE WITH CM 196168 PER TDRR 08220		27 MAR	J.K.
Y		REVISED PER TDRR 11569		25 AUG	
Z		REVISED AND UPGRADED TO CLASS A PER TDRR 17587		24 MAR 65	
AA		REVISED PER TDRR 25897		5 FEB 66	
AB		REVISION STATUS CHANGED		FEB 66	



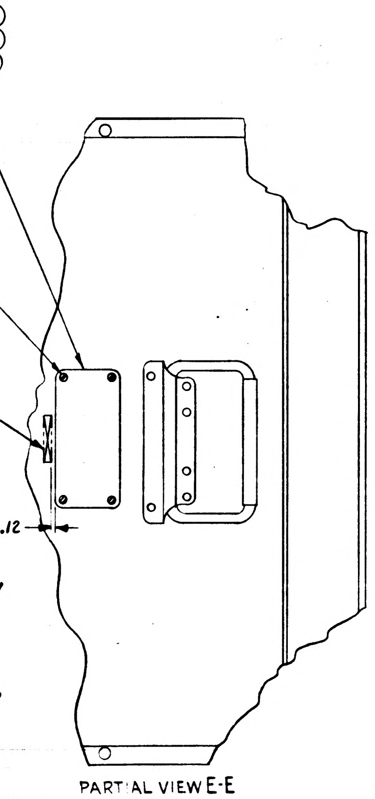
39
40 45 48 7 EACH REQD
56 13 4 EACH REQD
55
38
37 3 REQD
47 25 20 EACH REQD

INSIDE VIEW OF COVER ITEM 2(REF)



42 48 2 EACH REQD
46 49 4 EACH REQD
34
E
36
45 48 2 EACH REQD
44 49 2 EACH REQD
PS1
T1
35
50 41 4 EACH REQD
TERMINAL NO. 1
33
65 43 49 4 EACH REQD
E

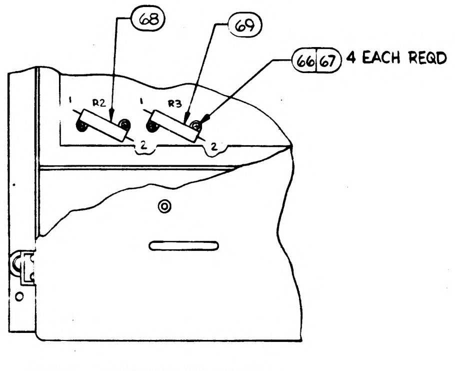
PARTIAL VIEW D-D



78
76
57
58
SEE NOTE 9
.12

PARTIAL VIEW E-E

THIS SHEET ADDED



68
69
66 67 4 EACH REQD
1
R2
1
R3
2
2

DETAIL SHOWING MOUNTING
OF ITEMS (68) AND (69)

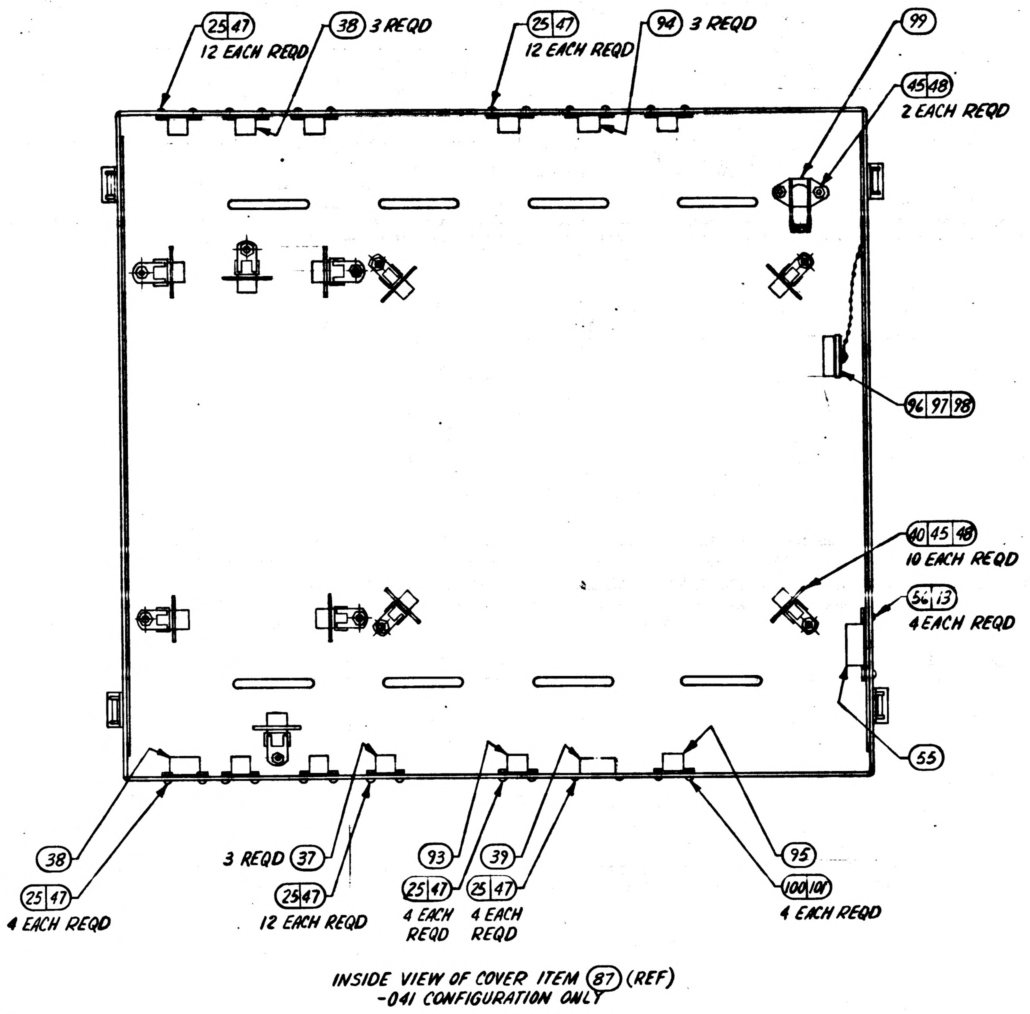
-021 CONFIGURATION ONLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — ± — ± —	AC ELECTRONICS DIVISION GENERAL MOTORS CORP MILWAUKEE WIS. DRAWN 9 SEP 63 DATE CHECKED WILSON 18 SEP 63 APPROVAL APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS BATTERY POWER PACK ASSEMBLY
DO NOT SCALE THIS DRAWING		
MATERIAL —	NASA APPROVAL	CODE IDENT NO · SIZE E · 1900011
CONTRACT NAS9-497	MIT APPROVAL	SCALE 1:2 · SHEET 2 OF 2

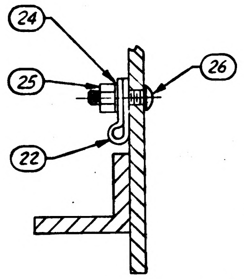
REVISIONS					
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPROVED
	AC	REPLACES REV AB WITH CHANGE PER TDRR 30107		3 JUN 66	

NOTES:

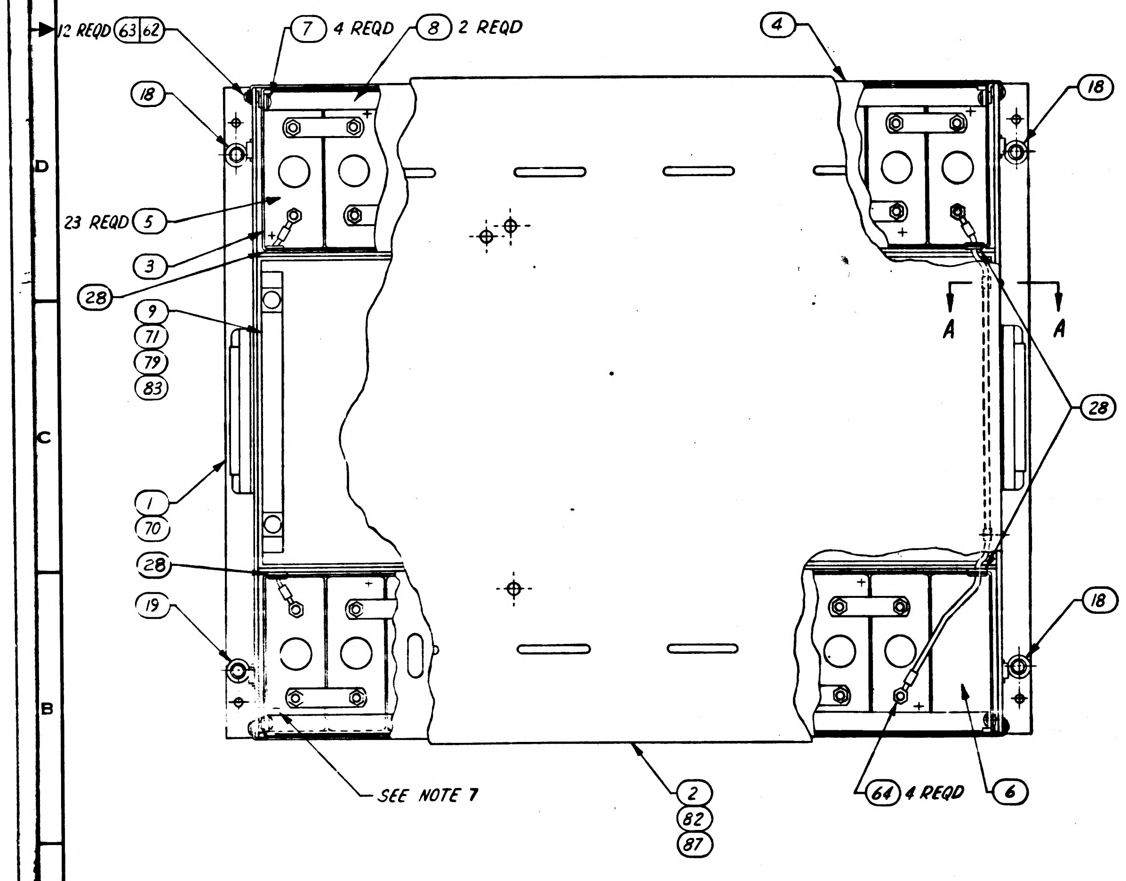
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2.
3.
4. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52 OR ITEM 73.
6. ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011.
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE (+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 OR ITEM 76 OR ITEM 78 OR ITEM 86 IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .12 HIGH.
9. MARK APPLICABLE REVISION LETTER (REV) PER ND1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.
10. ITEMS 59, 60, 88, 89, 90, 91 & 92 ARE PART OF THIS ASSEMBLY TO THE EXTENT SPECIFIED IN THE LIST OF MATERIALS.



INSIDE VIEW OF COVER ITEM (87) (REF)
-041 CONFIGURATION ONLY



PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1



041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4	-	-	-		101	1016151-002	NUT, SELF LOCKING
4	-	-	-		100	1006783-12	SCREW, MACHINE
1	-	-	-		99	1010400-006	CABLE CLAMP
1	-	-	-		98	1016151-006	NUT, SELF LOCKING
1	-	-	-		97	1006783-23	SCREW, MACHINE
1	-	-	-		96	MS3181-16C	CAP, PROTECTIVE
1	-	-	-		95	1897424-001	DUMMY RECEPTACLE
3	-	-	-		94	1016073-163	DUMMY RECEPTACLE
1	-	-	-		93	1016073-103	DUMMY RECEPTACLE
1	-	-	-		92	2901447	CABLE, ELEC, INTERCONNECT, W192 (BPP TO PCT II)
1	-	-	-		91	2901443	W186 (ADAPT TO IMU II)
1	-	-	-		90	2901445	W188 (ADAPT TO PSA, LEM
1	-	-	-		89	2901444	W187 (ADAPT TO IMU I)
1	-	-	-		88	2901446	CABLE, ELEC, INTERCONNECT, W189 (BPP TO ADAPT)
1	-	-	-		87	1902632	COVER, BATTERY POWER PACK
1	-	-	-		86	1004260-510	NAMEPLATE
X	-	-	-		85	1902623	WIRING DIAGRAM
X	-	-	-		84	1902624	SCHEMATIC DIAGRAM, ELECTRICAL
1	-	-	-		83	1902630-011	PANEL ASSEMBLY
-	1	-	-		82	1902541	COVER, BATTERY POWER PACK
-	X	-	-		81	1902537	WIRING DIAGRAM
-	X	-	-		80	1902538	SCHEMATIC DIAGRAM, ELECTRICAL
-	1	-	-		79	1902249-021	PANEL ASSEMBLY
-	1	-	-		78	1004260-159	NAMEPLATE
1	1	1	-		77	1902140	DOOR, ACCESS (INSEP ASSY)
-	-	1	-		76	1901304-236	NAMEPLATE
-	-	X	-		75	1902192	WIRING DIAGRAM
1	1	1	-		74	1902189	WIRE LIST BB
1	1	1	-		73	1902188	WIRING HARNESS B
-	-	X	-		72	1902138	SCHEMATIC DIAGRAM, ELECTRICAL
-	-	1	-		71	1902249-011	PANEL ASSEMBLY
1	1	1	-		70	1902128	CASE, BATTERY POWER PACK
1	1	1	-		69	RE75G1R00	(1896982-097) RESISTOR MIL-R-18546
1	1	1	-		68	RE75GR715	(1896982-083) RESISTOR MIL-R-18546
1	4	4	-		67	1016151-004	NUT, SELF LOCKING
1	4	4	-		66	AN505C-4R-10	SCREW, MACHINE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	4	4	4	4		65	AN960-C416	(1897006-042) WASHER, FLAT
SEE NOTE 4	4	4	4	4		64	1015906-50	TERMINAL LUG
SEE NOTE 4	12	12	12	12		63	1006783-43	SCREW, MACHINE
	12	12	12	12		62	AN960-C10L	(1897006-017) WASHER, FLAT
SEE NOTE 4&5	1	1	1	1		61	1015818-90	CONNECTOR
	1	1	1	1		60	1900955	CABLE, ELEC, INTERCONNECT, W100 (BPP TO PTC)
	-	1	1	1		59	1900954	CABLE, ELEC, INTERCONNECT, W101 (BPP TO IMU
	4	4	4	4		58	AN535-0-3	(1897109-103) SCREW, DRIVE
	-	-	-	1		57	1901304-208	NAMEPLATE
	4	4	4	4		56	1006783-27	SCREW, MACHINE
	1	1	1	1		55	MS3105-32	DUMMY RECEPTACLE
	-	-	-	X		54	1900559	WIRING DIAGRAM
	-	-	-	1		53	1900903	WIRE LIST BB
	-	-	-	1		52	1900923	WIRING HARNESS B
	-	-	-	X		51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
	4	4	4	4		50	AN335-4	NUT, PLAIN HEX
	10	10	10	10		49	AN363C428	NUT, SELF-LOCKING
	16	11	11	11		48	AN363C1032	NUT, SELF-LOCKING
	48	20	20	20		47	1006783-19	SCREW, MACHINE
	4	4	4	4		46	1006783-57	
	14	9	9	9		45	1006783-44	
SEE NOTE 4	2	2	2	2		44	1015826-407	
SEE NOTE 4	4	4	4	4		43	1015826-411	
SEE NOTE 4	2	2	2	2		42	1015826-304	SCREW, MACHINE
	4	4	4	4		41	MS35338-82	WASHER, LOCK
SEE NOTE 4	10	7	7	7		40	1016105-004	CLAMP
SEE NOTE 4	1	1	1	1		39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4	4	1	1	1		38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4	3	3	3	3		37	1016073-123	DUMMY RECEPTACLE
	1	1	1	1		36	1900158	INVERTER, STATIC
SEE NOTE 4	1	1	1	1		35	1015953	TRANSFORMER, POWER
	1	1	1	1		34	1900795	BRACKET, TRANSFORMER HOLD DOWN
	1	1	1	1		33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4	1	1	1	1		32	1016062-001	WASHER, WEAR
SEE NOTE 4	1	1	1	1		31	1016060-017	STUD, WING HEAD
SEE NOTE 4	1	1	1	1		30	1016061-001	SPRING, EJECTOR
SEE NOTE 4	1	1	1	1		29	1015857-1	WASHER, RETAINER
	4	4	4	4		28	MS35489-6	GROMMET, RUBBER
SEE NOTE 4	3	3	3	3		27	1006783-18	SCREW, MACHINE
	2	2	2	2		26	1006783-20	SCREW, MACHINE
SEE NOTE 4	50	22	22	22		25	1016151-004	NUT, SELF-LOCKING
	5	5	5	5		24	AN960-C4L	WASHER, FLAT
SEE NOTE 4	1	1	1	1		23	1015985-201	CABLE CLAMP
SEE NOTE 4	4	4	4	4		22	1015985-203	CABLE CLAMP
	4	4	4	4		21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4	4	4	4	4		20	1016067-003	CHAIN SAFETY
SEE NOTE 4	1	1	1	1		19	1016065-013	PIN, QUICK RELEASE
SEE NOTE 4	3	3	3	3		18	1016065-011	PIN, QUICK RELEASE
	4	4	4	4		17	1900773	RETAINER, PIN
	3	3	3	3		16	AN363C632	NUT, SELF-LOCKING
	3	3	3	3		15	1006783-24	SCREW, MACHINE
	-	-	-	1		14	1900471	DOOR, ACCESS (INSEP) ASSY
	13	13	13	13		13	AN363C832	NUT, SELF-LOCKING
	9	9	9	9		12	1006783-28	SCREW, MACHINE
	1	1	1	1		11	1900818	GASKET, BACK PLATE (RFI)
	1	1	1	1		10	1900472	BACKPLATE (INSEP) ASSY
	-	-	-	1		9	1900473-011	PANEL ASSY
	2	2	2	2		8	1900822	CLAMP, BATTERY
	4	4	4	4		7	1006783-42	SCREW, MACHINE
	1	1	1	1		6	1015972-002	DUMMY CELL
	23	23	23	23		5	1015972-001	CELL, NICKEL CADMIUM
	2	2	2	2		4	1900464	BATTERY COVER (INSEP) ASSY
	2	2	2	2		3	1900461	BATTERY CASE (INSEP) ASSY
	-	-	1	1		2	1900460	COVER, BATTERY POWER PACK
	-	-	-	1		1	1900456	CASE, BATTERY POWER PACK

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

APPLICABLE DASH NO.	NEXT ASSY	USED ON
-041	1900011-041	1900011-041
-031	1900011-031	1900011-031
-021	1900011-021	1900011-021
-011	1900011-011	1900011-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

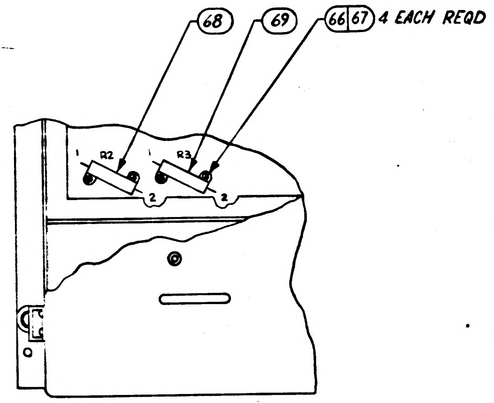
AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN L. SOMMER DATE 9 SEP 63
CHECKED J. SAYLES WILSON 18 SEP 63
APPROVAL
CONTRACT NAS 9-497
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

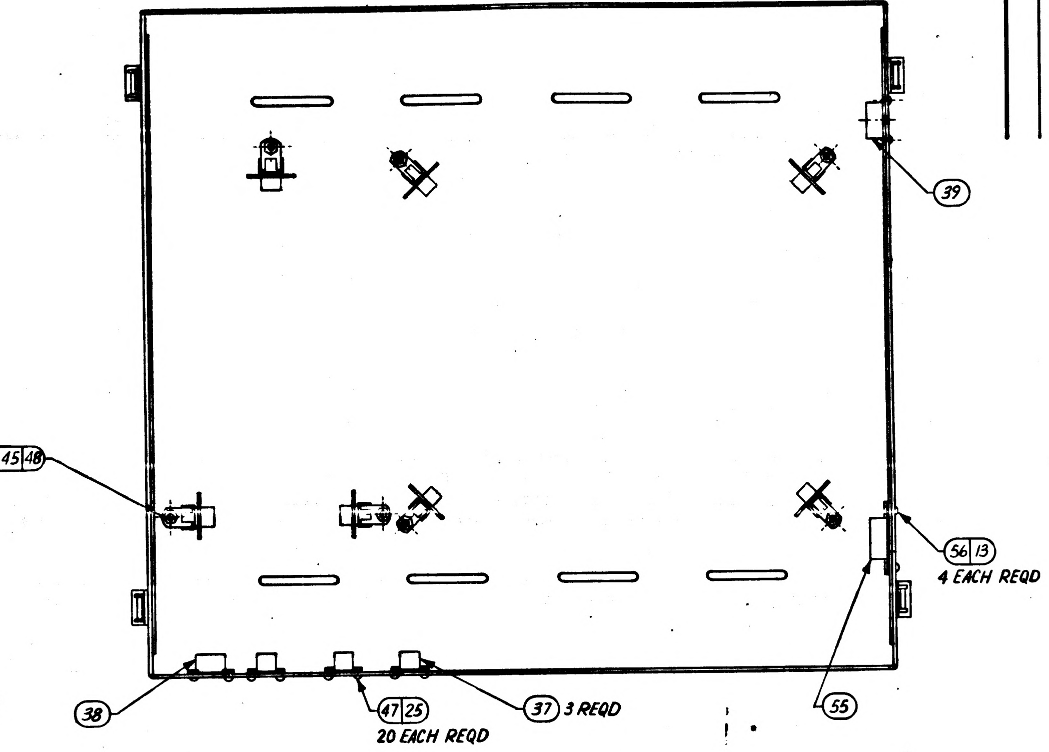
SIZE E | CODE IDENT NO. 99974 | 1900011
SCALE 1:2 | SHEET 1 OF 2

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPROVED
	AC	REPLACES REV AB WITH CHANGE PER TDRR 30107		3 JUN 66	J.K.



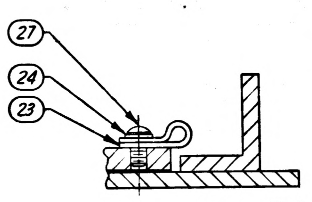
68
69
66 67 4 EACH REQD
R2
R3
1
2

DETAIL SHOWING MOUNTING OF ITEMS (68) AND (69) -021 CONFIGURATION ONLY

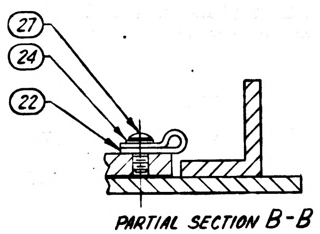


39
7 EACH REQD 40 45 48
56 13 4 EACH REQD
38
47 25 20 EACH REQD
37 3 REQD
55

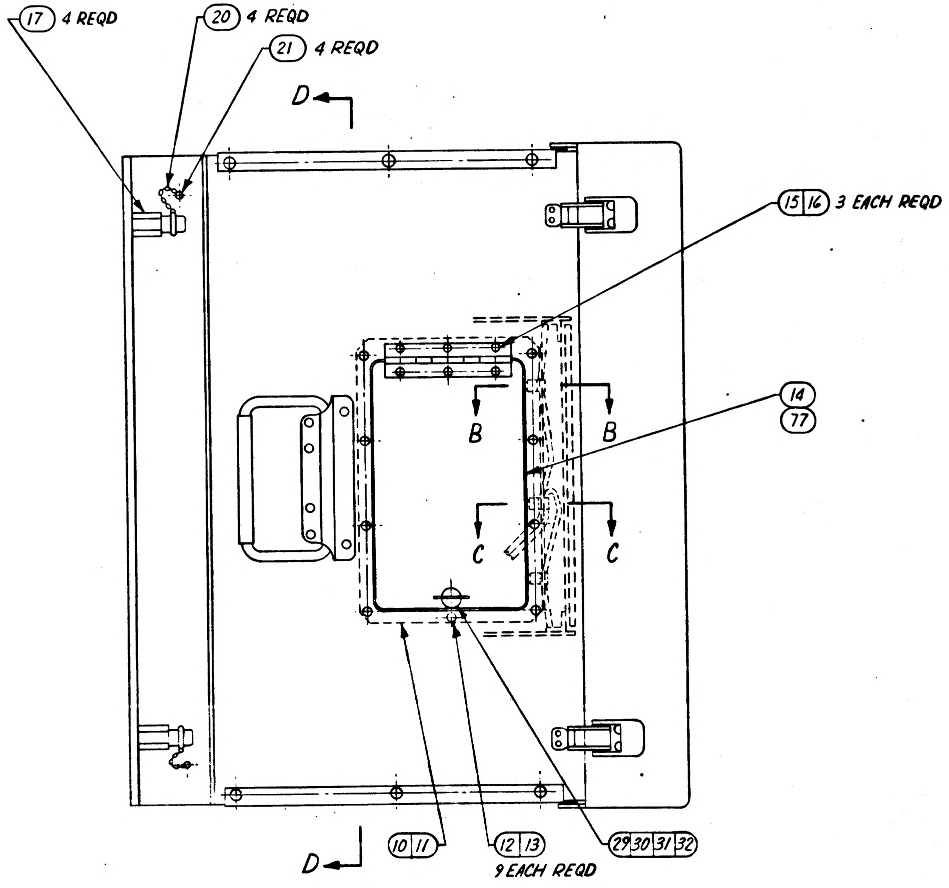
INSIDE VIEW OF COVER ITEM (2) (REF)



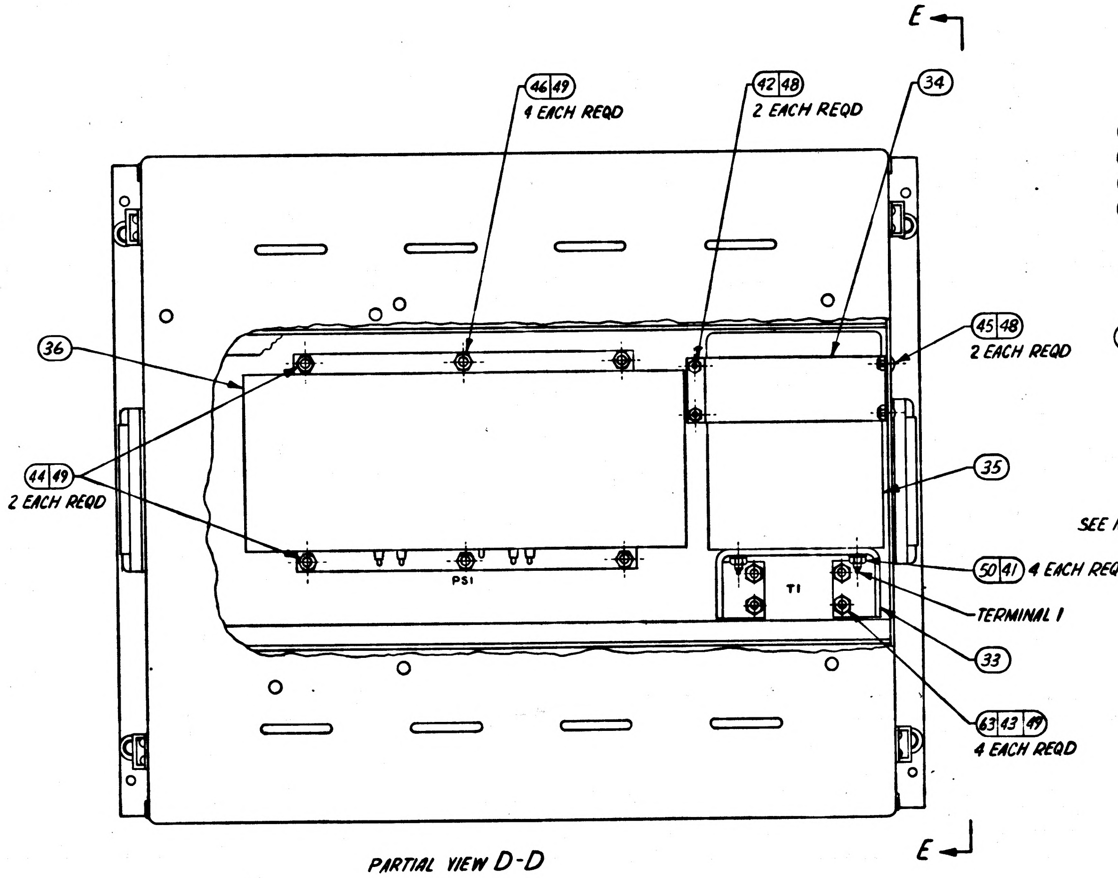
PARTIAL SECTION C-C
SCALE 2:1



PARTIAL SECTION B-B
TWO PLACES
SCALE 2:1

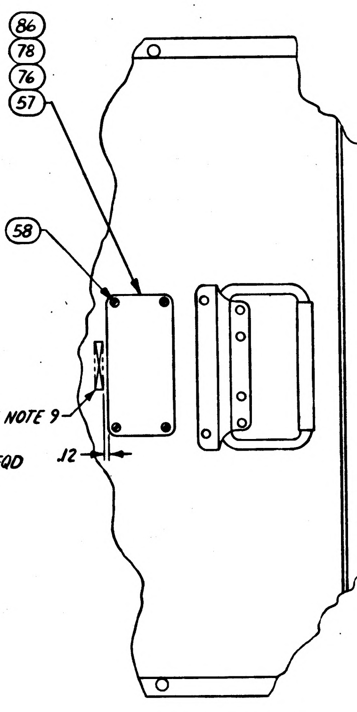


17 4 REQD
20 4 REQD
21 4 REQD
D
15 16 3 EACH REQD
B
B
14
77
C
C
10 11
12 13 9 EACH REQD
29 30 31 32
D



E
46 49 4 EACH REQD
42 48 2 EACH REQD
34
36
45 48 2 EACH REQD
44 49 2 EACH REQD
35
PS1
T1
50 41 4 EACH REQD
TERMINAL 1
33
63 43 49 4 EACH REQD
E

PARTIAL VIEW D-D



86
78
76
57
58
SEE NOTE 9
J2

PARTIAL VIEW E-E

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.
DRAWN R. W. HEISEL DATE 9 SEP 63
CHECKED J SAYLES WILSON 18 SEP 63
APPROVAL
CONTRACT NAS 9-497
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

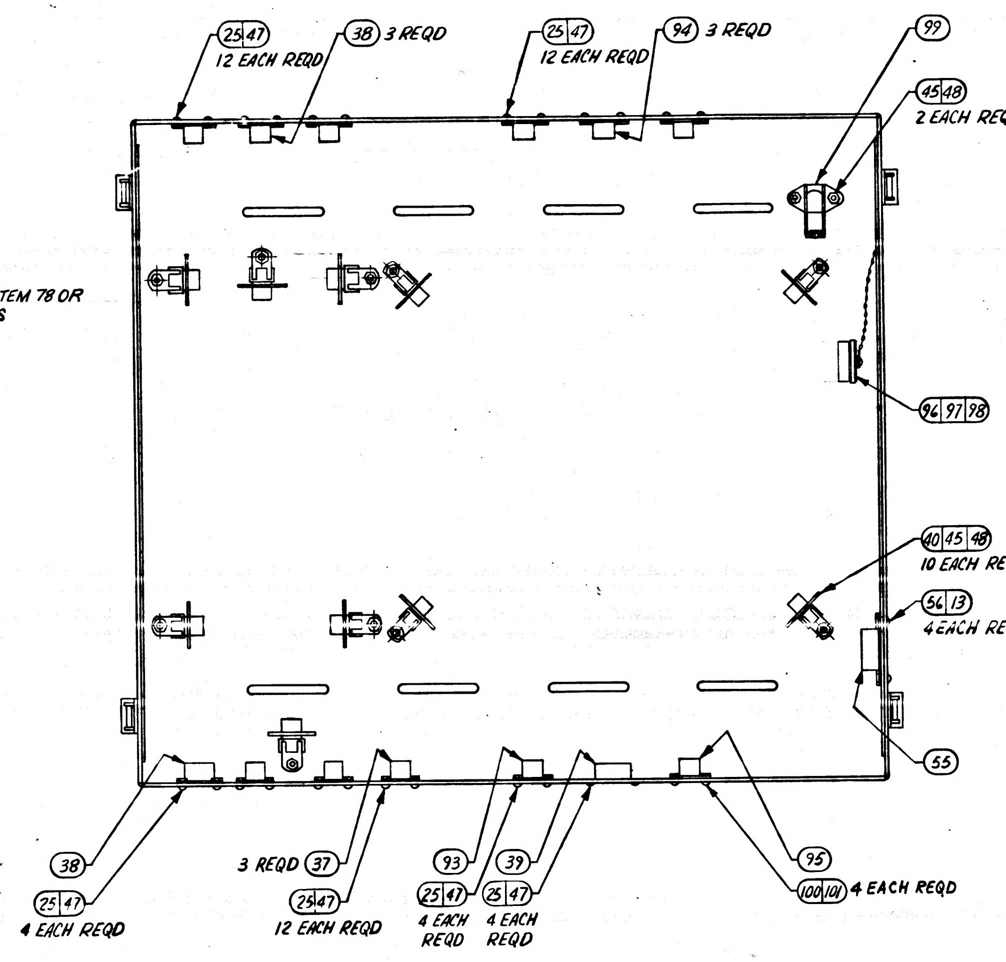
SIZE E
CODE IDENT NO. 99974
1900011
SCALE 1:2
SHEET 2 OF 2

NOTES:

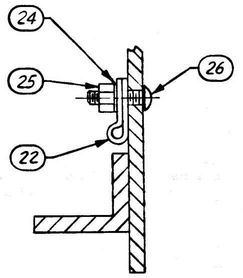
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. APPLY ITEM 114 TO ALL SCREWS NOT HAVING A LOCKING DEVICE.
3.
4. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52 OR ITEM 73.
6. ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011.
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE (+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 OR ITEM 76 OR ITEM 78 OR ITEM 86 OR ITEM 107 OR ITEM 116 IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .12 HIGH.
9. MARK APPLICABLE REVISION LETTER (REV) PER ND1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.
10. ITEMS 59, 60, 88, 89, 90, 91 & 92 ARE PART OF THIS ASSEMBLY TO THE EXTENT SPECIFIED IN THE LIST OF MATERIALS.

REVISIONS

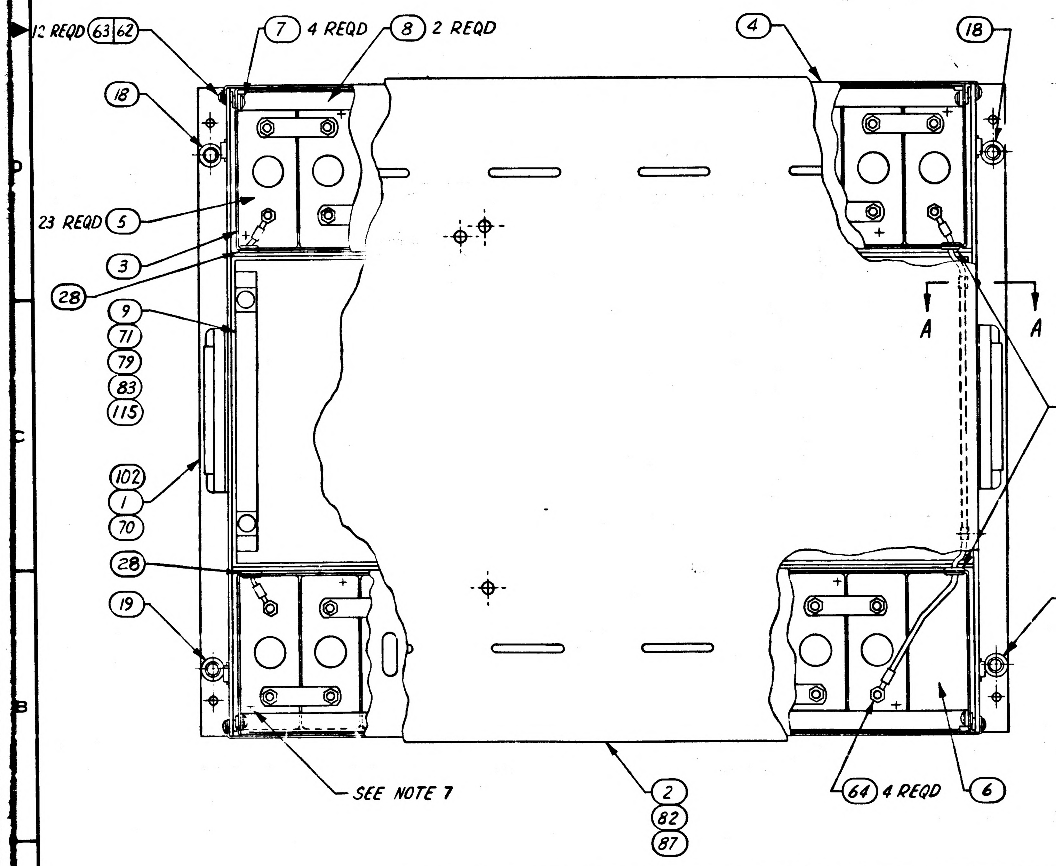
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPROVED
	AC	REPLACES REV AB WITH CHANGE PER TDRR 30107		3 JUN 66	
	AD	REVISED PER TDRR 34400		SEP 67	
	AE	REVISED PER TDRR 37304		FEB 69	



INSIDE VIEW OF COVER ITEM (87) (REF)
-041 CONFIGURATION ONLY



PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1



	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 4	1	1	–	–	–	–		109	1010630-28	SCREW, MACHINE
SEE NOTE 4	3	3	–	–	–	–		108	1006783-23	SCREW, MACHINE
	–	1	–	–	–	–		107	1004260-564	NAMEPLATE
	1	1	–	–	–	–		106	RE75GR249	(1896982-039) RESISTOR MIL-R-18546/1
SEE NOTE 4	2	2	–	–	–	–		105	1016000-13	STANDOFF
	☒	☒	–	–	–	–		104	1902673	WIRING DIAGRAM
	1	1	–	–	–	–		103	2901611	WIRING HARNESS B
	1	1	–	–	–	–		102	1902672	CASE, BATTERY POWER PACK
SEE NOTE 4	4	4	4	–	–	–		101	1016151-002	NUT, SELF LOCKING
SEE NOTE 4	4	4	4	–	–	–		100	1006783-12	SCREW, MACHINE
SEE NOTE 4	1	1	1	–	–	–		99	1010400-006	CABLE CLAMP
SEE NOTE 4	1	1	1	–	–	–		98	1016151-006	NUT, SELF LOCKING
SEE NOTE 4	1	1	1	–	–	–		97	1006783-23	SCREW, MACHINE
	1	1	1	–	–	–		96	MS3181-16C	CAP, PROTECTIVE
SEE NOTE 4	1	1	1	–	–	–		95	1897424-001	DUMMY RECEPTACLE
SEE NOTE 4	3	3	3	–	–	–		94	1016073-163	DUMMY RECEPTACLE
SEE NOTE 4	1	1	1	–	–	–		93	1016073-103	DUMMY RECEPTACLE
	1	1	1	–	–	–		92	2901447	CABLE, ELEC, INTERCONNECT, W192 (BPP TO PCT II)
	1	1	1	–	–	–		91	2901443	W186 (ADAPT TO IMU II)
	1	1	1	–	–	–		90	2901445	W188 (ADAPT TO PSA/LEM
	1	1	1	–	–	–		89	2901444	W187 (ADAPT TO IMU I)
	1	1	1	–	–	–		88	2901446	CABLE, ELEC, INTERCONNECT, W189 (BPP TO ADAPT)
	1	1	1	–	–	–		87	1902632	COVER, BATTERY POWER PACK
	–	–	1	–	–	–		86	1004260-510	NAMEPLATE
	–	–	☒	–	–	–		85	1902623	WIRING DIAGRAM
	☒	☒	☒	–	–	–		84	1902624	SCHEMATIC DIAGRAM, ELECTRICAL
	–	1	1	–	–	–		83	1902630-011	PANEL ASSEMBLY
	–	–	–	1	–	–		82	1902541	COVER, BATTERY POWER PACK
	–	–	–	☒	–	–		81	1902537	WIRING DIAGRAM
	–	–	–	☒	–	–		80	1902538	SCHEMATIC DIAGRAM, ELECTRICAL
	–	–	–	1	–	–		79	1902249-021	PANEL ASSEMBLY
	–	–	–	1	–	–		78	1004260-159	NAMEPLATE
	1	1	1	1	1	–		77	1902140	DOOR, ACCESS (INSEP ASSY)
	–	–	–	–	1	–		76	1901304-236	NAMEPLATE
	–	–	–	–	☒	–		75	1902192	WIRING DIAGRAM
	1	1	1	1	1	–		74	1902189	WIRE LIST BB
	–	–	1	1	1	–		73	1902188	WIRING HARNESS B
	–	–	–	–	☒	–		72	1902138	SCHEMATIC DIAGRAM, ELECTRICAL
	–	–	–	–	1	–		71	1902249-011	PANEL ASSEMBLY
	–	–	1	1	1	–		70	1902128	CASE, BATTERY POWER PACK
	1	1	1	1	1	–		69	RE75G1R00	(1896982-097) RESISTOR MIL-R-18546/1
	1	1	1	1	1	–		68	RE75GR715	(1896982-083) RESISTOR MIL-R-18546/1
SEE NOTE 4	6	6	4	4	4	–		67	1016151-004	NUT, SELF LOCKING
	5	5	4	4	4	–		66	AN505C-4R-10	SCREW, MACHINE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	4	4	4	4	4	4		65	AN960-C416	(1897006-042) WASHER, FLAT
SEE NOTE 4	4	4	4	4	4	4		64	1015906-50	TERMINAL LUG
SEE NOTE 4	12	12	12	12	12	12		63	1006783-43	SCREW, MACHINE
	12	12	12	12	12	12		62	AN960-C10L	(1897006-017) WASHER, FLAT
SEE NOTE 4 & 5	1	1	1	1	1	1		61	1015818-90	CONNECTOR
	1	1	1	1	1	1		60	1900955	CABLE, ELEC, INTERCONNECT, W100 (BPP TO PTC)
	–	–	–	1	1	1		59	1900954	CABLE, ELEC, INTERCONNECT, W101 (BPP TO IMU
	4	4	4	4	4	4		58	AN535-0-3	(1897109-103) SCREW, DRIVE
	–	–	–	–	–	1		57	1901304-208	NAMEPLATE
SEE NOTE 4	4	4	4	4	4	4		56	1006783-27	SCREW, MACHINE
	1	1	1	1	1	1		55	MS3105-32	DUMMY RECEPTACLE
	–	–	–	–	–	☒		54	1900559	WIRING DIAGRAM
	–	–	–	–	–	1		53	1900903	WIRE LIST BB
	–	–	–	–	–	1		52	1900923	WIRING HARNESS B
	–	–	–	–	–	☒		51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
	4	4	4	4	4	4		50	AN335-4	NUT, PLAIN HEX
	10	10	10	10	10	10		49	AN363C428	NUT, SELF-LOCKING
	16	16	16	11	11	11		48	AN363C1032	NUT, SELF-LOCKING
SEE NOTE 4	48	48	48	20	20	20		47	1006783-19	SCREW, MACHINE
SEE NOTE 4	4	4	4	4	4	4		46	1006783-57	
SEE NOTE 4	14	14	14	9	9	9		45	1006783-44	
SEE NOTE 4	2	2	2	2	2	2		44	1015826-407	
SEE NOTE 4	4	4	4	4	4	4		43	1015826-411	
SEE NOTE 4	2	2	2	2	2	2		42	1015826-304	SCREW, MACHINE
	4	4	4	4	4	4		41	MS35338-82	WASHER, LOCK
SEE NOTE 4	10	10	10	7	7	7		40	1016105-004	CLAMP
SEE NOTE 4	1	1	1	1	1	1		39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4	4	4	4	1	1	1		38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4	3	3	3	3	3	3		37	1016073-123	DUMMY RECEPTACLE
	1	1	1	1	1	1		36	1900158	INVERTER, STATIC
SEE NOTE 4	1	1	1	1	1	1		35	1015953	TRANSFORMER, POWER
	1	1	1	1	1	1		34	1900795	BRACKET, TRANSFORMER HOLD DOWN
	1	1	1	1	1	1		33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4	1	1	1	1	1	1		32	1016062-001	WASHER, WEAR
SEE NOTE 4	1	1	1	1	1	1		31	1016060-017	STUD, WING HEAD
SEE NOTE 4	1	1	1	1	1	1		30	1016061-001	SPRING, EJECTOR
SEE NOTE 4	1	1	1	1	1	1		29	1015857-1	WASHER, RETAINER
	4	4	4	4	4	4		28	MS35489-6	GROMMET, RUBBER
SEE NOTE 4	3	3	3	3	3	3		27	1006783-18	SCREW, MACHINE
SEE NOTE 4	3	3	2	2	2	2		26	1006783-20	SCREW, MACHINE
SEE NOTE 4	50	50	50	22	22	22		25	1016151-004	NUT, SELF-LOCKING
	5	5	5	5	5	5		24	AN960-C4L	WASHER, FLAT
SEE NOTE 4	1	1	1	1	1	1		23	1015985-201	CABLE CLAMP
SEE NOTE 4	4	4	4	4	4	4		22	1015985-203	CABLE CLAMP
	4	4	4	4	4	4		21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4	4	4	4	4	4	4		20	1016067-003	CHAIN SAFETY
SEE NOTE 4	1	1	1	1	1	1		19	1016065-013	PIN, QUICK RELEASE
SEE NOTE 4	3	3	3	3	3	3		18	1016065-011	PIN, QUICK RELEASE
	4	4	4	4	4	4		17	1900773	RETAINER, PIN
	3	3	3	3	3	3		16	AN363C632	NUT, SELF-LOCKING
SEE NOTE 4	3	3	3	3	3	3		15	1006783-24	SCREW, MACHINE
	–	–	–	–	–	1		14	1900471	DOOR, ACCESS (INSEP) ASSY
	13	13	13	13	13	13		13	AN363C832	NUT, SELF-LOCKING
SEE NOTE 4	9	9	9	9	9	9		12	1006783-28	SCREW, MACHINE
	1	1	1	1	1	1		11	1900818	GASKET BACK PLATE (RFI)
	1	1	1	1	1	1		10	1900472	BACKPLATE (INSEP) ASSY
	–	–	–	–	–	1		9	1900473-011	PANEL ASSY
	2	2	2	2	2	2		8	1900822	CLAMP, BATTERY
SEE NOTE 4	4	4	4	4	4	4		7	1006783-42	SCREW, MACHINE
SEE NOTE 4	1	1	1	1	1	1		6	1015972-002	DUMMY CELL
SEE NOTE 4	23	23	23	23	23	23		5	1015972-001	CELL, NICKEL CADMIUM
	2	2	2	2	2	2		4	1900464	BATTERY COVER (INSEP, ASSY)
	2	2	2	2	2	2		3	1900461	BATTERY CASE (INSEP, ASSY)
	–	–	–	–	1	1		2	1900460	COVER, BATTERY POWER PACK
	–	–	–	–	–	1		1	1900456	CASE, BATTERY POWER PACK

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

	061	051	041	031	021	011	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	CODE IDENT
	1	–	–	–	–	–	116	1004260-586	NAMEPLATE	
	1	–	–	–	–	–	115	1902630-021	PANEL ASSY	
	AR	AR	–	–	–	–	114	MIL-S-40083 (ORD)	CL30 SEALING & RETAINING COMPOUND	
SEE NOTE 4	2	2	–	–	–	–	113	1015985-006	CLAMP CABLE	
SEE NOTE 4	2	2	–	–	–	–	112	1015986-191	WASHER, SADDLE	
	2	2	–	–	–	–	111	AN960C6	(1897006-026) WASHER LOCK	
	3	3	–	–	–	–	110	MS35338-41	WASHER LOCK	

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

APPLICABLE DASH NO.	NEXT ASSY	USED ON
-061	1900342-051	1900342-051
-051	1900342-041	1900342-041
-041	1900342-031	1900342-031
-031	1900342-021	1900342-021
-021	1900342-011	1900342-011
-011	—	—

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± —
3 PLACE DECIMALS ± —
ANGLES ± —

DO NOT SCALE THIS DRAWING

MATERIAL —

APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

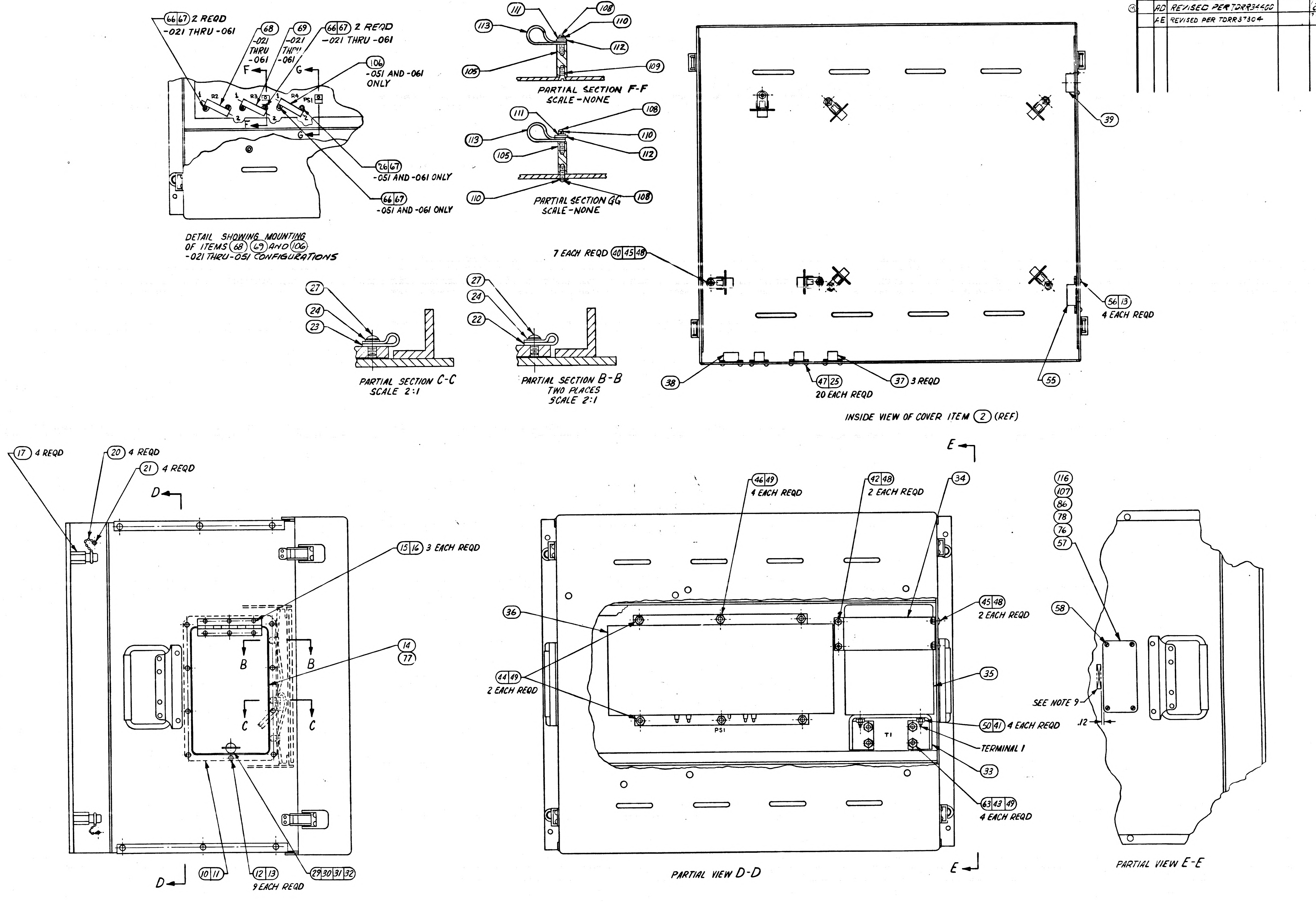
DRAWN L. SOMMER DATE SEP 63
CHECKED J SAYLES WILSO.. 19 SEP 63
APPROVAL
CONTRACT NAS 9-427
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK ASSEMBLY

SIZE E
CODE IDENT NO. 99974
1900011
SCALE 2
SHEET 1 OF 2

REVISIONS					
ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPROVED
	AC	REPLACES REV AB WITH CHANGE PER TDRR 30107		3 JUN 66	
	AD	REVISED PER TDRR34400		1 SEP 67	
	AE	REVISED PER TDRR37304		7 FEB 69	



66 67 2 REQD -021 THRU -061
68 -021 THRU -061
69 -021 THRU -061
66 67 2 REQD -021 THRU -061
106 -051 AND -061 ONLY
R2
R3
R4
PS1
F
G
26 67 -051 AND -061 ONLY
66 67 -051 AND -061 ONLY
DETAIL SHOWING MOUNTING OF ITEMS 68 69 AND 106 -021 THRU -051 CONFIGURATIONS
111
108
110
113
112
105
109
PARTIAL SECTION F-F SCALE-NONE
PARTIAL SECTION GG SCALE-NONE
27
24
23
22
PARTIAL SECTION C-C SCALE 2:1
PARTIAL SECTION B-B TWO PLACES SCALE 2:1
7 EACH REQD 40 45 48
39
56 13 4 EACH REQD
38
47 25 20 EACH REQD
37 3 REQD
55
INSIDE VIEW OF COVER ITEM 2 (REF)
17 4 REQD
20 4 REQD
21 4 REQD
D
15 16 3 EACH REQD
14
77
B
C
10 11
12 13 9 EACH REQD
29 30 31 32
46 49 4 EACH REQD
42 48 2 EACH REQD
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63 43 49 4 EACH REQD
PARTIAL VIEW D-D
116
107
86
78
76
57
58
SEE NOTE 9
J2
PARTIAL VIEW E-E

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE DECIMALS ± 3 PLACE DECIMALS ± ANGLES ±	AC ELECTRONICS DIVISION GENERAL MOTORS CORP. MILWAUKEE WIS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	DRAWN R. W. HEISEL DATE 9 SEP 63 CHECKED J SAYLES WILSON 18 SEP 63 APPROVAL CONTRACT NAS 9-497	BATTERY POWER PACK ASSEMBLY
DO NOT SCALE THIS DRAWING		
MATERIAL	NASA APPROVAL	SIZE E CODE IDENT NO. 99974 1900011
APPROVAL	MIT APPROVAL	SCALE 1:2 SHEET 2 OF 2

APOLLO G&N Specification
PS1900011 K
Original Issue Date:
Release Authority: TDRR
Class A Release
TDRR 18135

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

(Continued) **Record of Revisions**

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				AC	NASA
⑥ 7/5/66	J	29995	1, 2, 4, 7, 8, 9, 11. Now 14 pages,	MGM	----
			was 11 pages. WS/AC		
8/24/67	K	34404	1 RDL/AC	MGM EA	---

This specification consists of page i
to iii including i-I and 1 to 14 inclusive.

APPROVALS	NASA/MSC	MIT/IL	AC

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A1	ADDED 1900158-011 INVERTER STATIC	DO 51593	21 MAY 63	FK WD

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01518 **DATE** June 12, 1963

			1		1	1900158	INVERTER STATIC
			011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900030-011	1900030-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN A.J. FLUDER 19-MAR-63
MALIKOWSKI DATE 25 MAR 63
CHECKED
APPROVAL AM Bray 25 MAR 63
APPROVAL L. Goldman 6-12-63
NASA APPROVAL Jack Barnard
MIT APPROVAL Perry K Bryant

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INERTIAL COMPONENTS
TEMPERATURE CONTROLLER

CODE IDENT NO.
SIZE C
1900011
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS1900011

Class Release
TDRR

PROCUREMENT SPECIFICATION
FOR
BATTERY POWER PACK

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 06229 DATE 2/11/64

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	10396	2-10/ECO-195738			
B	10618	3,7,9,/ECO-196505			
C	10619	6 through 10			

This specification consists of page i to iii and 1 to 11 inclusive.

APOLLO G&N Specification
PS1900011 C

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

The purpose of this document is to establish the manufacturing and test requirements for procurement of the Battery Power Pack for use in the APOLLO Guidance and Navigation Ground Support Equipment.

W Kupfer 11 Feb 64
MIT/IL DATE

7/27/64
NASA/MSC DATE

PREPARED BY	**TITLE**	**DATE**
Helen V. Vaitkus	Spec Eng Writer	26 Nov 63
AC Spark Plug		
EXAMINED BY B.J. R.B.	**TITLE**	**DATE**
	GSE Design	12-3-63
AC Spark Plug		
APPROVED BY	**TITLE**	**DATE**
W Schmidt	GSE Eng	2-7-64
MIT/IL		
APPROVED BY	**TITLE**	**DATE**
MIT/IL		
APPROVED BY	**TITLE**	**DATE**
MIT/IL		

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Battery Power Pack, hereafter called the battery pack.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of invitations for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-P-116	Preservation, Methods of
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of

APOLLO G&N

ND-1002018	General Specification for APOLLO Ground Support Equipment
ND-1002023	Procedure for Serialization of Components, Assemblies, etc. for APOLLO Guidance and Navigation Equipment
ND-1015404	General Specification, Configuration, Process and Quality Control Requirements for Suppliers of High Reliability Articles for Use in Spacecraft and Supporting Equipment

DRAWINGS

APOLLO G&N

1900011	Battery Power Pack

3. REQUIREMENTS

3.1 DESCRIPTION. The battery pack shall provide the PTC with 115V, 60 cps power which is automatically fed from a battery-driven converter when line power is interrupted. The battery pack shall contain its own charger which is manually initiated and automatically terminated into a maintaining type (trickle) charge. When the battery capacity has been depleted, the battery pack shall provide an automatic switchover to an external source. In the emergency mode, direct battery voltage shall be switched as a substitute for AGE power.

3.2 GENERAL REQUIREMENTS

3.2.1 Qualification Test. A representative sample of the battery pack shall be manufactured using the methods and procedures proposed for the production lot. These shall be submitted to the NASA Inspector for qualification test at an activity designated in the contract or by the purchaser.

These qualification tests are conducted to determine whether or not the battery pack is being produced in compliance with the requirements of the contract, specification, and drawings. Failure of the battery pack to meet these requirements may result in disqualification of the supplier as determined by NASA or the purchaser.

Further production of the item by the supplier prior to approval of the procuring activity or the completion of the preproduction tests shall be at the supplier's risk. Requalification will be required at the discretion of NASA or the purchaser in the event that:

a. The supplier has modified the item.

b. The supplier has instituted a change in the material used or in his processing.

c. The specification requirements for the item have been amended or revised sufficiently to affect the character of the item.

The qualification tests will be conducted in accordance with the procedures specified in Section 4 of this specification.

3.2.2 Requalification Test. The supplier shall submit one or more battery packs to be selected from each production lot by the purchaser for submission to a designated testing activity to determine compliance of the sample with the requirements of the contract, specification, and drawings.

3.2.3 Materials and Construction. The materials used in fabricating the battery pack shall be in strict accordance with the applicable drawings and specifications referenced herein. Substitute materials and/or processes shall be selected of such quality as to ensure that the equipment will meet the requirements of this specification and shall be subject to prior approval of the purchaser.

3.2.4 Weight, Dimensions, Finish, and Marking. The weight, dimensions, finish, and marking of the battery packs shall comply with the requirements specified herein or on the applicable drawings.

3.2.5 Serial Numbers. Each battery pack shall be identified by a serial number assigned in accordance with Specification ND-1002023.

3.2.6 Workmanship. The fabrication and finish of the battery pack, its assemblies, subassemblies, and parts shall be such as to produce a unit free from any defect that would affect proper functioning in service.

3.2.7 Interchangeability. Unless otherwise specified, the battery pack and its component parts shall be physically and functionally interchangeable without selection or fitting.

3.2.8 General Specification. Unless otherwise specified, the requirements of Specification ND-1002018 apply as requirements of this specification.

3.2.9 Functional Requirements

3.2.9.1 Voltage Requirements

3.2.9.1.1 Input Voltage. The battery pack shall be capable of operating from an input voltage of 115.0±11.5V, 60±3 cps.

3.2.9.1.2 Output Voltage

a. The battery pack shall be capable of supplying to a nominal 100 VA load an output voltage of 115.0±11.5V, 60±3 cps with a maximum distortion of 5 percent for a minimum of 6 hours. The external portion of the 100 VA load shall be 26±5 percent ohms in series with the parallel combination of 139±1 percent ohms and 1.12±5 percent henries.

b. The battery pack shall be capable of supplying an emergency voltage of 28+7, -3 vdc at the rate of 5 amps for a minimum of 6 hours.

3.2.9.2 Charging Function. The battery pack shall be capable of recharging its battery cells. After the first 5 minutes of charge initiation, the charging current shall not exceed 10 amp. A trickle charge of 5 to 50 ma shall continue after the battery is fully charged.

3.2.9.3 Control Function. The battery pack shall have the following control function capabilities:

a. Capability shall exist to indicate with lamps the application of 115 vac line power, the operation of the inverter, and operation of the portable temperature controller in conjunction with the battery pack. Failure in operation shall initiate an audible and visual alarm. Manual capability shall exist to inhibit only the audible alarm. Remedy of the failure shall again initiate an audible alarm. Manual capability shall exist to reset the alarm.

3 Mar 67

b. Capability shall exist to indicate with lamps when charging is initiated, when battery is in use, and when battery is discharged. An ampere hour meter (AHM) shall indicate when charging can be initiated and the number of ampere hours used during a discharge.

c. Capability shall exist to indicate with lamps when the normal (system) gyro heater power is in use or when the portable temperature controller is used.

d. Capability shall exist to indicate with a lamp the application of emergency heater power directly to the power and servo assembly and inertial measurement unit heater circuitry. Application of this power can be initiated from the battery pack or through a remote control; however, interruption of this power can be initiated only from the battery pack.

e. Capability shall exist to permit application of power from an external auxiliary battery pack when the battery has discharged.

3.2.10 Design

3.2.10.1 Indicators. The battery pack shall provide visual and audible alarms for failures and malfunctions as well as a battery capacity indicator. When used with the transfer switch, the battery pack shall indicate the three distinct IMU heater modes. An indicator lamp shall be illuminated when power is available to charge the batteries and another lamp shall be illuminated only when the charging cycle is in progress. Lamps shall indicate when the battery is being used and when its capacity has been depleted.

3 MAR'64

4. QUALITY ASSURANCE PROVISIONS

4.1 GENERAL. Unless otherwise specified herein, the supplier is responsible for the performance of all inspection requirements prior to submission for NASA inspection and acceptance. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to NASA. Inspection records of the examinations and tests shall be kept complete and available to NASA as specified in the contract or order. The supplier shall conform to Class 3 of Specification ND-1015404.

4.1.1 Acceptance Tests. These tests shall be accomplished on each battery pack being submitted for acceptance under the contract. Acceptance test data on each unit accepted must accompany shipment to the purchaser. Acceptance tests shall be witnessed by the cognizant government inspector, a representative of the purchaser, or as the purchaser may direct in the procurement order. These tests are detailed in 4.2. Failure of the battery pack to comply with these requirements shall result in rejection of the item or lot of items.

4.1.2 Qualification and Requalification Tests. Qualification tests shall be accomplished at a NASA designated activity. These tests, as outlined in 4.3, shall be conducted after the award of the contract to determine that the product will meet all specified requirements.

Failure of the battery pack to comply with these requirements shall result in the rejection of the lot or the cessation of production, as determined by the purchaser.

4.1.3 Test Conditions

4.1.3.1 Atmospheric. Unless otherwise specified herein, the battery pack shall be subjected to tests under the following ambient conditions:

a.	Temperature	25°±10°C
b.	Relative Humidity	Not more than 90%
c.	Barometric Pressure	28 to 32 inches of Hg

4.1.3.2 Precautions. During the tests specified herein, do not expose the battery pack to spark or flame, or smoke in the test area; oxygen and at times hydrogen gases are generated when the battery cells are charging.

4.1.3.3 Test Sequence. The following tests shall be performed in the sequence specified and with the battery pack cover removed. The sequence of operations within each individual test shall be as specified.

a. Visual and Mechanical Inspection
b. Continuity
c. Normal and Alarm Function
d. Normal Power Charge
e. Discharge
f. Recharge

4.2 ACCEPTANCE TESTS

4.2.1 Visual and Mechanical Inspection. A comprehensive inspection shall be made of the battery pack to determine the extent of compliance with the requirements of this specification and Drawing 1900011, and shall at least include determination of the following:

a. Size, dimension, tolerance, weight, appearance, and markings.

b. Adequacy of materials, parts, and subassemblies; compliance with specific ratings and conformance to applicable specifications.

c. Finish, coatings, construction, markings, and nameplates, as applicable.

d. Wiring, cabling, welding, soldering, color coding, and terminals, as applicable.

e. Workmanship and cleanup.

4.2.2 Continuity. The continuity test shall be performed as specified in Table I.

4.2.3 Voltage Polarity Check. With a voltmeter connected from Pin P3-A to Pin P3-J, Pin P3-A shall be positive with respect to Pin P3-J (30 vdc nominal).

TABLE I

CONTINUITY

TERMINAL PINS		RESISTANCE (ohms)	CONDITIONS
From	To		
P1-A	P1-C	100K min	
J5-E	J2-V	100K min	P3 connected to J3, S1 open
J5-E	J2-R	100K min	P3 connected to J3, S1 open
J5-E	J2-U	100K min	P3 connected to J3, S1 open
J3-A	J3-J	100K min	S1 open, P3 removed from J3
J3-A	J3-J	5 min	S1 closed, P3 removed from J3. Operate all lamp indicator switches.
J2-B	J6-I	<1	
J2-B	J6-K	↑	
J2-A	J6-J		
J2-A	J6-L		
J2-J	J6-W		
J2-J	J6-U		
J2-H	J6-X		
J2-H	J6-V		
J2-G	J6-a		
J2-E	J6-D		
J2-F	J6-A		
J2-D	J6-B		
J2-C	J6-C		
J2-M	J6-F		
J2-M	P1-B		ICTC POWER switch "ON"
J2-V	J6-Y		
J2-V	J6-T		
J2-V	P1-C		
J2-R	J2-M	↓	
J2-R	J6-F	<1	

TABLE I (Continued)

CONTINUITY

TERMINAL PINS		RESISTANCE (ohms)	CONDITIONS
From	To		
J3-J	J5-E	<1	
J1-D	J5-E	↑	
J5-D	J6-P		
J5-D	J6-R		
J5-A	J5-B		
J1-B	J5-E		
J3-J	J4-M		
J3-J	J4-R		
J2-U	J4-F		
J2-M	J4-D		
J4-B	J6-Y		
J4-C	P1-B		
J4-C	J6-F	↓	ICTC POWER switch "ON"
J4-H	P1-A	<1	

4.2.4 Normal and Alarm Function. With a nominal 20 VA load, the external portion defined as 775±1 percent ohms in parallel with 3.33±5 percent henries, connected between pins J2-U and J2-R and pins J2-L and J2-M jumpered, the normal and alarm function test shall be performed as follows:

a. With 115V applied to pins P1-A (Hi) and P1-B (Lo), the ICTC POWER switch in the "ON" position, and the 115V OFF ALARM RESET and PTC OFF ALARM RESET switches alternately pressed, the alarm shall stop ringing.

b. With 115V removed from pins P1-A (Hi) and P1-B (Lo) and the 115V OFF ALARM RESET switch pressed, the alarm bell may stop ringing. If the alarm bell continues to ring, pressing the INVERTER OFF ALARM RESET switch shall stop it.

c. With 115.0±11.5V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo) and the ICTC POWER switch in the "OFF" position, the PRESS TO CHARGE lamp shall illuminate. With the ICTC POWER switch in the "ON" position, the 115V LINE POWER and PTC OPERATING lamps shall illuminate and 115.0±11.5 vac shall appear between pins J2-U (Hi) and J2-R (Lo). No amber or red lamps (alarm reset lamps) shall illuminate.

d. With the power removed from the pins specified in 4.2.4.a, the alarm bell shall ring and the 115V OFF ALARM RESET, INVERTER POWER, and BATTERY IN USE lamps shall illuminate. With the 115V LINE POWER—115V OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the 115V OFF ALARM RESET, INVERTER POWER, PTC OPERATING, and BATTERY IN USE lamps shall remain illuminated.

e. With the power reapplied to the pins specified in 4.2.4.a, the alarm bell shall ring again. With the 115V LINE POWER—115V OFF ALARM RESET switch actuated, the alarm bell shall stop ringing, the 115V OFF ALARM RESET, INVERTER POWER, and BATTERY IN USE lamps shall extinguish and the 115V LINE POWER lamp shall illuminate.

f. With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER—115V OFF ALARM RESET switch, and the BATTERY fuse removed, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

g. With the BATTERY fuse replaced, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

h. With the jumper removed from pins J2-L and J2-M, the PTC OPERATING lamp shall extinguish, the alarm bell shall ring, and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

i. With the jumper replaced between pins J2-L and J2-M, the alarm bell shall ring again. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm shall stop ringing, the PTC OFF ALARM RESET lamp shall extinguish, and the PTC OPERATING lamp shall illuminate.

j. With pins J6-P, J6-d, and J6-e jumpered and J6-E jumpered to J6-F, the NORMAL HEATER POWER lamp shall illuminate. With the jumper removed from J6-D and the EMERGENCY switch pressed, the NORMAL HEATER POWER lamp shall not extinguish. The jumper shall be replaced. With the jumper removed from pins J6-E and J6-F, the NORMAL HEATER POWER lamp shall extinguish and the PTC HEATER POWER lamp shall illuminate.

k. With the EMERGENCY switch actuated, the 115V OFF ALARM RESET, PTC HEATER POWER, INVERTER POWER, and PTC OPERATING lamps shall extinguish, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall illuminate, and 23 to 35 vdc shall appear between pins J6-N (Hi) and J6-P (Lo). With the EMERGENCY HEATER POWER PRESS TO TURN OFF switch actuated, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall extinguish and 23 to 35 vdc shall disappear from pins J6-N (Hi) and J6-P (Lo). The alarm shall not ring in either switchover. The 115V OFF ALARM RESET, PTC HEATER POWER, PTC OPERATING, and INVERTER POWER lamps shall illuminate.

m. Repeat 4.2.4.k, except, momentarily jumper pins J5-D and J5-E instead of actuating the EMERGENCY switch.

4.2.5 Normal Power Charge. The normal power charge test shall be performed in the following sequence. The charging period may be interrupted. If line power is lost during high or medium rate charge, the PRESS TO CHARGE switch must be pressed to continue charge.

a. With 115.0±11.5V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo), and the ICTC POWER switch in the "OFF" position, the inner dial of the AHM set to 35 amp hr, the pointer of the AHM set to 0 amp hr, the PRESS TO CHARGE lamp shall illuminate.

(1) With the red pointer of the AHM at the "FULL" position, the charging current as measured between pins J3-A (Hi) and P3-A shall be 5 to 50 ma after 5 minutes.

(2) With the red pointer rotated slowly cw and the PRESS TO CHARGE switch depressed, the charging circuit shall switch to medium rate between 0 and 2 amp hr, the current after 5 minutes shall be 2 to 6 amps and the CHARGING lamp shall illuminate.

(3) With the red pointer rotated slowly cw, the charging circuit shall switch to high charge between 6 to 10 amp hrs and the charging current after 5 minutes shall be 4 to 10 amps.

(4) Set the red pointer to 35 amp hr and continue to charge the battery. The charging circuit shall terminate automatically into a trickle rate between 2 and 0 or FULL amp hr. At that time the CHARGING lamp shall extinguish.

b. With the battery fully charged, the individual cell voltages shall be within 50 mv of the total voltage divided by the number of cells.

4.2.6 Discharge. The discharge test shall be performed in the following sequence:

a. With the 100 VA load connected between pins J2-R and J2-U, 115V removed from P1 the ICTC POWER switch in the "ON" position, and the alarm bell ringing stopped by actuating the 115V LINE POWER-115V OFF ALARM RESET switch, and INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING-PTC OFF ALARM RESET switches if necessary, the battery shall not discharge in less than 6 hours. The BATTERY IN USE lamp shall illuminate. Upon the battery discharge, the BATTERY DISCHARGED lamp shall illuminate. The BATTERY IN USE lamp shall extinguish, and the alarm bell shall ring. With the INVERTER OFF ALARM RESET switch pressed, the alarm bell shall stop ringing.

b. During the discharge period specified in 4.2.6.a, at one-hour intervals, the 100 VA load shall be temporarily replaced with the 20 VA load. Until the battery discharges, the output of the inverter measured between pins J2-U (Hi) and J2-R (Lo), for both ends, shall be as follows:

(1) Voltage: 115.0±11.5V
(2) Frequency: 60±3 cps
(3) Distortion: 5 percent max

After each voltage measurement, the 20 VA load shall be replaced with the 100 VA load and the discharge continued.

e. After the battery has been discharged, apply 28±3 vdc with a minimum capacity of 6 amp to pins J1-A (+) and J1-B (-). The INVERTER POWER lamp shall illuminate, 115.0±11.5 vac shall appear between pins J2-U (Hi) and J2-R (Lo) and the alarm bell shall ring. With the INVERTER OFF ALARM RESET switch pressed, the alarm bell shall stop ringing.

4.2.7 Recharge. With 115.0±11.5V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo), the ICTC POWER switch in the "OFF" position, the PRESS TO CHARGE-CHARGING switch actuated, and the time observed, the current between pins J3-A and P3-A shall drop to 10 amp or less after 5 minutes of charging time. With 115V momentarily removed from P1, the CHARGING lamp shall extinguish. Reinitiate the charge cycle. Continue charging until the battery is fully charged.

NOTE: Whenever possible, the battery pack should be connected to 115V, 60 cps line power to maintain a trickle charge on the battery.

4.3 QUALIFICATION AND REQUALIFICATION TESTS. Qualification and requalification tests shall consist of the tests of 4.2.

5. PREPARATION FOR DELIVERY

5.1 PRESERVATION AND PACKAGING. The battery pack shall be preserved and packaged in accordance with Specification MIL-E-17555, Level C.

5.1.1 Level C (Minimum Military Packaging). Level C packaging is that which will afford protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. This level, in general, will conform to applicable carrier rules and regulations of this level.

5.1.1.1 Cleaning. Cleaning for Level C preservation and packaging shall be in accordance with Method C-1 of Specification MIL-P-116.

5.1.1.2 Unit Protection. The battery pack shall be individually afforded unit protection in accordance with Method III of Specification MIL-P-116. Items not used within the time period specified must either be preserved or repackaged in accordance with Level A or Level B requirements if storage beyond an additional year is anticipated.

5.2 REPAIR PARTS. Repair parts shall have preservation and packaging per the applicable repair parts list and its packaging supplement.

5.3 PACKING. The equipment shall be packed in accordance with Specification MIL-E-17555 for shipment in accordance with Level C requirements.

5.4 MARKING. In addition to any special marking required by the contract or order, the marking of unit, interior packages, and exterior shipping containers shall be in accordance with Level C of Specification MIL-E-17555.

6. NOTES

Notice: When APOLLO G&N drawings, specifications, or other data are used for any purpose other than in connection with a definitely related NASA procurement operation, NASA thereby incures no responsibility nor any obligation whatsoever; and the fact that NASA may have formulated, furnished, or in any way supplied the said drawing, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

OJR/dmh

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A1	ADDED 1900158-011 INVERTER STATIC	DO 51593	21 MAY 63	FK WD
A1		CHANGED IN ACCORDANCE WITH MXC 187000		25 JUN 63	GB
A2		CHANGED IN ACCORDANCE WITH MXC 187182		25 JUN 63	GB
B		CHANGED IN ACCORDANCE WITH MXC 187524		5 JUL. 63	R.D.
C		CHANGED IN ACCORDANCE WITH MXC 187735		5 JUL 63	R.D.
D		CHANGED IN ACCORDANCE WITH MXC 188051		18 JULY 63	JHP AU
		INCORPORATES CHANGES A THRU D PER TDRR 02467		6 AUG 63	WK

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01518 **DATE** JUN12,63

QTY REQUIRED			EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		011				
		1		42	1015869-525	LIGHT, INDICATOR ASSEMBLY
		1		41	1015869-524	LIGHT, INDICATOR ASSEMBLY
		1		40	1015869-523	LIGHT, INDICATOR ASSEMBLY
		1		39	1015869-347	LIGHT, INDICATOR ASSEMBLY
		1		38	1015869-148	LIGHT, INDICATOR ASSEMBLY
		1		37	RC20GF102J	RESISTOR, FIXED
		1		36	1900314	AMPERE HOUR METER
		2		35	MIL-F-15160/02F02A32V10AS	FUSE
		1		34	1015975-001	CONN, RECEPTACLE ELECTRICAL
		1				
				32	1015873-008	FUSEHOLDER
		1		31	1015978-443	RESISTOR, FIXED
		1		30	1015925-2	TIMER, ELECTRONIC FLASHER
		1		29	1896951-005	RESISTOR, FIXED
		3		28	1896951-012	RESISTOR, FIXED
		3		27	1015967-001	SEMICONDUCTOR DEVICE, DIODE
		1		26	1015987-008	BUSHING, STRAIN RELIEF
		1		25	1015832-218	RELAY, SENSITIVE
		3		24	1015982	RELAY
		3		23	1015983	RELAY, ARMATURE
		1		22	1015971-015	CABLE ASSEMBLY
		23		21	1015972-001	BATTERY, STORAGE

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED			EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		011				
		1		20	RE75G30R1	RESISTOR
		1		19	RE75GR715	RESISTOR
		2		18	RE75G1R00	RESISTOR
		1		15	1015954	TRANSFORMER
		1		14	1015953	TRANSFORMER
		3		13	MIL-F-15160/02F02A250V5AS	FUSE
		3		12	MIL-F-15160/02F02A250V2AS	FUSE
		3		11	MIL-F-15160/02F02B250V1AS	FUSE
		4		10	MS26572-1	FUSE HOLDER
		6		9	1015873-001	FUSE HOLDER INDICATING
		1		7	MIL-L-3661ALH73LC12RN	LIGHT, INDICATOR
		1		6	MS25237-327	LAMP
		1		5	MIL-S-8372 TYPE J3	BELL
		1		2	MS25308-23	SWITCH, TOGGLE
		1		1	1900158	INVERTER STATIC

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ + +
− − −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN A.J. FLUDER 19-MAR-63
MALIKOWSKI DATE 25 MAR 63
CHECKED
APPROVAL AM Bray 25 MAR 63
APPROVAL L. Gelman 6-12-63
NASA APPROVAL Barnard
MIT APPROVAL Perry K Bryant

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK

CODE IDENT NO.
SIZE C
1900011
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS1900011 D

Class Release
TDRR

PROCUREMENT SPECIFICATION
FOR
BATTERY POWER PACK

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 06279 DATE 2/11/64

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	10395	2-10/ECO-195738			
B	10618	3,7,9,/ECO-196505			
ⓜ C	10619	6 through 10			
D	14383	8 R06/[illegible]	WK	AM	11-24-64

This specification consists of page i to iii and 1 to 11 inclusive.

f. With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER—115V OFF ALARM RESET switch, and the BATTERY fuse removed, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

g. With the BATTERY fuse replaced, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

h. With the jumper removed from pins J2-L and J2-M, the PTC OPERATING lamp shall extinguish, the alarm bell shall ring, and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

i. With the jumper replaced between pins J2-L and J2-M, the alarm bell shall ring again. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm shall stop ringing, the PTC OFF ALARM RESET lamp shall extinguish, and the PTC OPERATING lamp shall illuminate.

j. With pins J6-P, J6-d, and J6-e jumpered and J6-E jumpered to J6-F, the NORMAL HEATER POWER lamp shall illuminate. With the jumper removed from J6-d and the EMERGENCY switch pressed, the NORMAL HEATER POWER lamp shall not extinguish. The jumper shall be replaced. With the jumper removed from pins J6-E and J6-F, the NORMAL HEATER POWER lamp shall extinguish and the PTC HEATER POWER lamp shall illuminate.

k. With the EMERGENCY switch actuated, the 115V OFF ALARM RESET, PTC HEATER POWER, INVERTER POWER, and PTC OPERATING lamps shall extinguish, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall illuminate, and 23 to 35 vdc shall appear between pins J6-N (Hi) and J6-P (Lo). With the EMERGENCY HEATER POWER PRESS TO TURN OFF switch actuated, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall extinguish and 23 to 35 vdc shall disappear from pins J6-N (Hi) and J6-P (Lo). The alarm shall not ring in either switchover. The 115V OFF ALARM RESET, PTC HEATER POWER, PTC OPERATING, and INVERTER POWER lamps shall illuminate.

m. Repeat 4.2.4.k, except, momentarily jumper pins J5-D and J5-E instead of actuating the EMERGENCY switch.

APOLLO G&N Specification
PS1900011 E

Class A Release
TDRR 18135

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	10396	2-10/ECO-195738			
B	10618	3,7,9,/ECO-196505			
C	10619	6 through 10			
D	14383	8	WK	AM	11-24-64
E	18135	i, 1, 5, 6, 7, 9, 10 & 11	WK	ACM	4/7/65

This specification consists of page i to iii and 1 to 11 inclusive.

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Battery Power Pack, hereafter called the battery pack.

1.2 CLASSIFICATION. This specification covers the requirements for the following types of equipment. Unless identified by the respective type, all requirements of this specification are applicable for all types.

a. Type I: The requirements for part number 1900011-011 shall be designated as Type I.
b. Type II: The requirements for part number 1900011-021 shall be designated as Type II.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of invitations for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

APOLLO G&N

ND-1002018	General Specification for APOLLO Ground Support Equipment
ND-1002023	Procedure for Serialization of Components, Assemblies, etc., for APOLLO Guidance and Navigation Equipment
ND-1002214	General Specification for Preservation, Packing and Container Marking of APOLLO Guidance and Navigation Major Assemblies, Assemblies, Subassemblies, Parts and Associated Ground Support Equipment
ND-1015404	General Specification, Configuration, Process and Quality Control Requirements for Suppliers of High Reliability Articles for Use in Spacecraft and Supporting Equipment

DRAWINGS

APOLLO G&N

1900011	Battery Power Pack

4. QUALITY ASSURANCE PROVISIONS

4.1 GENERAL. Unless otherwise specified herein, the supplier is responsible for the performance of all inspection requirements prior to submission for NASA inspection and acceptance. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to NASA. Inspection records of the examinations and tests shall be kept complete and available to NASA as specified in the contract or order. The supplier shall conform to Class 3 of Specification ND-1015404.

4.1.1 Acceptance Tests. These tests shall be accomplished on each battery pack being submitted for acceptance under the contract. Acceptance test data on each unit accepted must accompany shipment to the purchaser. Acceptance tests shall be witnessed by the cognizant government inspector, a representative of the purchaser, or as the purchaser may direct in the procurement order. These tests are detailed in 4.2. Failure of the battery pack to comply with these requirements shall result in rejection of the item or lot of items.

4.1.2 Qualification and Requalification Tests. Qualification tests shall be accomplished at a NASA designated activity. These tests, as outlined in 4.3, shall be conducted after the award of the contract to determine that the product will meet all specified requirements.

Failure of the battery pack to comply with these requirements shall result in the rejection of the lot or the cessation of production, as determined by the purchaser.

4.1.3 Test Conditions

4.1.3.1 Atmospheric. Unless otherwise specified herein, the battery pack shall be subjected to tests under the following ambient conditions:

a.	Temperature	25°±10°C
b.	Relative Humidity	Not more than 90%
c.	Barometric Pressure	28 to 32 inches of Hg

4.1.3.2 Precautions. During the tests specified herein, do not expose the battery pack to spark or flame, or smoke in the test area; oxygen and at times hydrogen gases are generated when the battery cells are charging.

4.1.3.3 Test Sequence. The following tests shall be performed in the sequence specified and with the battery pack cover removed. The sequence of operations within each individual test shall be as specified.

a. Visual and Mechanical Inspection
b. Continuity
c. Normal and Alarm Function
d. Normal Power Charge
e. Discharge
f. Recharge

4.2 ACCEPTANCE TESTS

4.2.1 Visual and Mechanical Inspection. A comprehensive inspection shall be made of the battery pack to determine the extent of compliance with the requirements of this specification and Drawing 1900011, and shall at least include determination of the following:

a. Size, dimension, tolerance, weight, appearance, and markings.

b. Adequacy of materials, parts, and subassemblies; compliance with specific ratings and conformance to applicable specifications.

c. Finish, coatings, construction, markings, and nameplates, as applicable.

d. Wiring, cabling, welding, soldering, color coding, and terminals, as applicable.

e. Workmanship and cleanup.

4.2.2 Continuity. The continuity test shall be performed as specified in Table I.

4.2.3 Voltage Polarity Check. With a voltmeter connected from Pin P3-A to Pin P3-J, Pin P3-A shall be positive with respect to Pin P3-J (30 vdc nominal).

TABLE I

CONTINUITY

TERMINAL PINS		RESISTANCE (ohms)	CONDITIONS
From	To		
P1-A	P1-C	100K min	
J5-E	J2-V	100K min	P3 connected to J3, S1 open
J5-E	J2-R	100K min	P3 connected to J3, S1 open
J5-E	J2-U	100K min	P3 connected to J3, S1 open
J3-A	J3-J	100K min	S1 open, P3 removed from J3, J3-A positive with respect to J3-J.
J3-A	J3-J	5 min	S1 closed, P3 removed from J3: Operate all lamp indicator switches.
J2-B	J6-I	<1	
J2-B	J6-K	↑	
J2-A	J6-J		
J2-A	J6-L		
J2-J	J6-W		
J2-J	J6-U		
J2-H	J6-X		
J2-H	J6-V		
J2-G	J6-a		
J2-E	J6-D		
J2-F	J6-A		
J2-D	J6-B		
J2-C	J6-C		
J2-M	J6-F		
J2-M	P1-B		ICTC POWER switch "ON" *1
J2-V	J6-Y		
J2-V	J6-T		
J2-V	P1-C		
J2-R	J2-M		
J2-R	J6-F	↓	
J2-M	J4-D	<1	*2

TABLE I (Continued)

CONTINUITY

TERMINAL PINS		RESISTANCE (ohms)	CONDITIONS
From	To		
J3-J	J5-E	<1	
J1-D	J5-E	↑	
J5-D	J6-P		
J5-D	J6-R		
J5-A	J5-B		
J1-B	J5-E		
J3-J	J4-M		
J3-J	J4-R		
J2-U	J4-F		
J2-M	J4-D		
J4-B	J6-Y		
J4-C	P1-B		
J4-C	J6-F	↓	ICTC POWER switch "ON" *1
J4-H	P1-A	<1	
J4-C	J6-F	100K min	ICTC POWER switch "ON" *2

*1 Type I only *2 Type II only

4.2.4 Normal and Alarm Function. With a nominal 20 VA load, the external portion defined as 778±1 percent ohms in parallel with 3.32±5 percent henries, connected between pins J2-U and J2-R and pins J2-L and J2-M jumpered, the normal and alarm function test shall be performed as follows:

a. With 115V applied to pins P1-A (Hi) and P1-B (Lo), the ICTC POWER switch in the "ON" position, and the 115V OFF ALARM RESET and PTC OFF ALARM RESET switches alternately pressed, the alarm shall stop ringing.

b. With 115V removed from pins P1-A (Hi) and P1-B (Lo) and the 115V OFF ALARM RESET switch pressed, the alarm bell may stop ringing. If the alarm bell continues to ring, pressing the INVERTER OFF ALARM RESET switch shall stop it.

c. With 115.0±11.5V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo) and the ICTC POWER switch in the "OFF" position, the PRESS TO CHARGE lamp shall illuminate. With the ICTC POWER switch in the "ON" position, the 115V LINE POWER and PTC OPERATING lamps shall illuminate and 115.0±11.5 vac shall appear between pins J2-U (Hi) and J2-R (Lo). No amber or red lamps (alarm reset lamps) shall illuminate.

d. With the power removed from the pins specified in 4.2.4.a, the alarm bell shall ring and the 115V OFF ALARM RESET, INVERTER POWER, and BATTERY IN USE lamps shall illuminate. With the 115V LINE POWER—115V OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the 115V OFF ALARM RESET, INVERTER POWER, PTC OPERATING, and BATTERY IN USE lamps shall remain illuminated.

e. With the power reapplied to the pins specified in 4.2.4.a, the alarm bell shall ring again. With the 115V LINE POWER—115V OFF ALARM RESET switch actuated, the alarm bell shall stop ringing, the 115V OFF ALARM RESET, INVERTER POWER, and BATTERY IN USE lamps shall extinguish and the 115V LINE POWER lamp shall illuminate.

4.2.5 Normal Power Charge. The normal power charge test shall be performed as follows for the respective types of equipment. The charging period may be interrupted. If line power is lost during the charge cycle, the PRESS TO CHARGE switch shall be pressed to continue charge.

4.2.5.1 Type I. The normal power charge test for Type I equipment shall be performed in the following sequence:

a. With 115.0±11.5V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo), and the ICTC POWER switch in the "OFF" position, the inner dial of the AHM set to 35 amp hr, the pointer of the AHM set to 0 amp hr, the PRESS TO CHARGE lamp shall illuminate.

    (1) With the red pointer of the AHM at the "FULL" position, the charging current as measured between pins J3-A (Hi) and P3-A shall be 5 to 50 ma after 5 minutes.

    (2) With the red pointer rotated slowly cw and the PRESS TO CHARGE switch depressed, the charging circuit shall switch to medium rate between 0 and 2 amp hr, the current after 5 minutes shall be 2 to 6 amps and the CHARGING lamp shall illuminate.

    (3) With the red pointer rotated slowly cw, the charging circuit shall switch to high charge between 6 to 10 amp hrs and the charging current after 5 minutes shall be 4 to 10 amps.

    (4) With the 115V removed, the CHARGING lamp shall extinguish.

    (5) With the 115V reapplied, the battery shall be charging at a trickle rate.

    (6) When the PRESS TO CHARGE switch is depressed, the charging circuit shall switch to a high rate and the CHARGING lamp shall illuminate.

    (7) Set the red pointer to 35 amp hr and continue to charge the battery. The charging circuit shall terminate automatically into a trickle rate between 2 and 0 or FULL amp hr. At that time the CHARGING lamp shall extinguish.

b. With the battery fully charged, the individual cell voltages shall be within 50 mv of the total voltage divided by the number of cells.

4.2.5.2 Type II. The normal power charge test for Type II equipment shall be performed in the following sequence:

a. With the 100 va load connected between J2-R and J2-U, no power applied, the ICTC POWER switch in the "ON" position, the alarm bell ringing stopped by; actuating the 115V LINE POWER-115V OFF ALARM RESET switch, the INVERTER POWER-INVERTER OFF ALARM RESET switch, and the PTC OPERATING-PTC OFF ALARM RESET switch, as necessary, the battery shall be discharged for 1/2 hour, but not below a terminal voltage of 25.3 vdc.

b. With 115.0±11.5V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo), the ICTC switch in the "OFF" position, the inner dial of the AHM set to 35 amp hr and the pointer of the AHM set to 0 amp hr, the PRESS TO CHARGE lamp shall illuminate.

(1) With the red pointer of the AHM set at the "FULL" position, the charging current as measured between pins J3-A (Hi) and P3-A shall be 5 to 50 ma after 5 minutes.

(2) With the PRESS TO CHARGE switch depressed and the red pointer of the AHM rotated slowly cw, the charging circuit shall switch to a high rate between 0 and 2 amp hr and the CHARGING lamp shall illuminate. The plateau current shall be 6 to 10 amps and the plateau voltage shall be 31 to 34 vdc. Set the red pointer to 35 amp hr.

(3) With the 115V removed, the CHARGING lamp shall extinguish.

(4) With the 115V reapplied, the battery shall be charging at a trickle rate.

(5) When the PRESS TO CHARGE switch is depressed, the charging circuit shall switch to a high rate and the CHARGING lamp shall illuminate.

(6) As the battery terminal voltage rises above 34 vdc, the current shall decrease (3 amps minimum). At 37±1 vdc the current shall rise sharply. The plateau current shall be 6 to 10 amps and the plateau voltage shall be 38 to 41 vdc. Set the red pointer to 20 amp hr and continue to charge the battery.

(7) The charging circuit shall terminate automatically into a trickle rate between 0 and 2 amp hr or FULL. At that time the CHARGING lamp shall extinguish.

c. With the battery fully charged, the individual cell voltages shall be within 50 mv of the total voltage divided by the number of cells.

4.2.6 Discharge. The discharge test shall be performed in the following sequence:

a. With the 100 VA load connected between pins J2-R and J2-U, 115V removed from P1 the ICTC POWER switch in the "ON" position, and the alarm bell ringing stopped by actuating the 115V LINE POWER-115V OFF ALARM RESET switch, and INVERTER POWER-INVERTER OFF ALARM RESET AND PTC OPERATING-PTC OFF ALARM RESET switches if necessary, the battery shall not discharge in less than 6 hours. The BATTERY IN USE lamp shall illuminate. Upon the battery discharge, the BATTERY DISCHARGED lamp shall illuminate. The BATTERY IN USE lamp shall extinguish, and the alarm bell shall ring. With the INVERTER OFF ALARM RESET switch pressed, the alarm bell shall step ringing.

b. During the discharge period specified in 4.2.6.a, at one-hour intervals, the 100 VA load shall be temporarily replaced with the 20 VA load. Until the battery discharges, the output of the inverter measured between pins J2-U (Hi) and J2-R (Lo), for both ends, shall be as follows:

(1) Voltage: 115.0±11.5V
(2) Frequency: 60±3 cps
(3) Distortion: 5 percent max

After each voltage measurement, the 20 VA load shall be replaced with the 100 VA load and the discharge continued.

c. After the battery has been discharged, apply 28±3 vdc with a minimum capacity of 6 amp to pins J1-A (+) and J1-B (-). The INVERTER POWER lamp shall illuminate, 115.0±11.5 vac shall appear between pins J2-U (Hi) and J2-R (Lo) and the alarm bell shall ring. With the INVERTER OFF ALARM RESET switch pressed, the alarm bell shall stop ringing.

4.3 QUALIFICATION AND REQUALIFICATION TESTS. Qualification and requalification tests shall consist of the tests of 4.2.

5. PREPARATION FOR DELIVERY

5.1 GENERAL. The battery pack shall be prepared for delivery in accordance with Specification ND1002214. A thin sheet of polyethylene shall be placed under the vent caps and tested for leakage by inverting the cell(s) for several minutes.

6. NOTES

Notice: When APOLLO G&N drawings, specifications, or other data are used for any purpose other than in connection with a definitely related NASA procurement operation, NASA thereby incurs no responsibility nor any obligation whatsoever; and the fact that NASA may have formulated, furnished, or in any way supplied the said drawing, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

F | 1100061

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A1	ADDED 1900158-011 INVERTER STATIC	DO 51593	21 MAY 63	FK
A1		CHANGED IN ACCORDANCE WITH MXC 187000		25 JUN 63	
A2		CHANGED IN ACCORDANCE WITH MXC 187182		25 JUN 63	
B		CHANGED IN ACCORDANCE WITH MXC 187524		5 JUL. 63	R.D.
C		CHANGED IN ACCORDANCE WITH MXC 187735		5 JUL 63	R.D.
D		CHANGED IN ACCORDANCE WITH MXC 188051		18 JULY 63	JHP AU
		INCORPORATES CHANGES A THRU D PER TDRR 02467		6 AUG 63	
E		CHANGED IN ACCORDANCE WITH MXC 188464		21 AUG 63	C.A.M.
F		REPLACED WITH CHANGE BY REVISION "G" PER MXC 188667	TDRR 03425	5 SEP 63	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01518 **DATE** JUN 12, 63

Ⓕ REPLACED WITH CHANGE BY REVISION "G" PER MXC 188667

PICTURE INCOMPLETE

QTY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		42	1015869-525	LIGHT, INDICATOR ASSEMBLY
1		41	1015869-524	LIGHT, INDICATOR ASSEMBLY
1		40	1015869-523	LIGHT, INDICATOR ASSEMBLY
1		39	1015869-347	LIGHT, INDICATOR ASSEMBLY
1		38	1015869-148	LIGHT, INDICATOR ASSEMBLY
1		37	RC20GF102J	RESISTOR, FIXED
1		36	1900314	AMPERE HOUR METER
2		35	MIL-F-15160/02F02A32V10AS	FUSE
1		34	1015975-001	CONN, RECEPTACLE ELECTRICAL
1				
		32	1015873-008	FUSEHOLDER
1		31	1015978-443	RESISTOR, FIXED
1		30	1015925-2	TIMER, ELECTRONIC FLASHER
1		29	1896951-005	RESISTOR, FIXED
3		28	1896951-012	RESISTOR, FIXED
3		27	1015967-001	SEMICONDUCTOR DEVICE, DIODE
1		26	1015987-008	BUSHING, STRAIN RELIEF
1		25	1015832-218	RELAY, SENSITIVE
3		24	1015982	RELAY
3		23	1015983	RELAY, ARMATURE
1		22	1015971-015	CABLE ASSEMBLY
23		21	1015972-001	BATTERY, STORAGE

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		20	RE75G30R1	RESISTOR
1		19	RE75GR715	RESISTOR
2		18	RE75G1R00	RESISTOR
1		15	1015954	TRANSFORMER
1		14	1015953	TRANSFORMER
3		13	MIL-F-15160/02F02A250V5AS	FUSE
3		12	MIL-F-15160/02F02A250V2AS	FUSE
3		11	MIL-F-15160/02F02B250V1AS	FUSE
4		10	MS26572-1	FUSE HOLDER
6		9	1015873-001	FUSE HOLDER INDICATING
4		8	1015902-3	TERMINAL-LUG
1		7	MIL-L-3661ALH73LC12RN	LIGHT, INDICATOR
1		6	MS25237-327	LAMP
1		5	MIL-S-8372 TYPE J3	BELL
2		4	MS3108R-8S-1S	CONNECTOR, PLUG, ELECTRICAL, ANGLE 90°
2		3	MS3102R-8S-1P	CONNECTOR, RECEPTACLE, ELECT., BOX MOUNTING.
1		2	MS25308-23	SWITCH, TOGGLE
1		1	1900158	INVERTER STATIC

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19-MAR-63
MALIKOWSKI 25 MAR 63
CHECKED
APPROVAL AM Bray 25 MAR 63
APPROVAL L. Gedman 6-12-63
NASA APPROVAL Jack Barnard
MIT APPROVAL Perry K Bryant

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK

CODE IDENT NO.
SIZE C
1900011
SCALE —
SHEET

MIL 1078C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS1900011 F

Class A Release
TDRR 18135

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	10395	2-10/ECO-195738			
B	10618	3,7,9,/ECO-196505			
C	10619	6 through 10			
D	14383	8 ECO/[illegible]	WK	AM	11-24-64
E	18135	i, 1, 5, 6, 7, 9, 10 & 11 ECO/[illegible]	WK	ACM	4/7/65
F	21053	8, 9 ECO/[illegible]	WK	ACM	7/21/65

This specification consists of page i to iii and 1 to 11 inclusive.

f. With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER—115V OFF ALARM RESET switch, and the BATTERY fuse removed, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

g. With the BATTERY fuse replaced, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

h. Type II: With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER—115V OFF ALARM RESET switch, and P4 removed from J4, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

i. Type II: With P4 connected to J4, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

j. With the jumper removed from pinsJ2-L and J2-M, the PTC OPERATING lamp shall extinguish, the alarm bell shall ring, and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

k. With the jumper replaced between pins J2-L and J2-M, the alarm bell shall ring again. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm shall stop ringing, the PTC OFF ALARM RESET lamp shall extinguish, and the PTC OPERATING lamp shall illuminate.

m. With pins J6-P, J6-d, and J6-e jumpered and J6-E jumpered to J6-F, the NORMAL HEATER POWER lamp shall illuminate. With the jumper removed from J6-d and the EMERGENCY switch pressed, the NORMAL HEATER POWER lamp shall not extinguish. The jumper shall be replaced. With the jumper removed from pins J6-E and J6-F, the NORMAL HEATER POWER lamp shall extinguish and the PTC HEATER POWER lamp shall illuminate.

n. With the EMERGENCY switch actuated, the 115V OFF ALARM RESET, PTC HEATER POWER, INVERTER POWER, and PTC OPERATING lamps shall extinguish, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall illuminate, and 23 to 35 vdc shall appear between pins J6-N (Hi) and J6-P (Lo). With the EMERGENCY HEATER POWER PRESS TO TURN OFF switch actuated, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall extinguish and 23 to 35 vdc shall disappear from pins J6-N (Hi) and J6-P (Lo). The alarm shall not ring in either switchover. The 115V OFF ALARM RESET, PTC HEATER POWER, PTC OPERATING, and INVERTER POWER lamps shall illuminate.

o. Repeat 4.2.4.n, except, momentarily jumper pins J5-D and J5-E instead of actuating the EMERGENCY switch.

4.2.5 Normal Power Charge. The normal power charge test shall be performed as follows for the respective types of equipment. The charging period may be interrupted. If line power is lost during the charge cycle, the PRESS TO CHARGE switch shall be pressed to continue charge.

4.2.5.1 Type I. The normal power charge test for Type I equipment shall be performed in the following sequence:

a. With 115.0±11.5V, 60±3 applied to pins P1-A (Hi) and P1-B (Lo), and the ICTC POWER switch in the "OFF" position, the inner dial of the AHM set to 35 amp hr, the pointer of the AHM set to 0 amp hr, the PRESS TO CHARGE lamp shall illuminate.

  (1) With the red pointer of the AHM at the "FULL" position, the charging current as measured between pins J3-A (Hi) and P3-A shall be 5 to 50 ma after 5 minutes.

  (2) With the red pointer rotated slowly cw and the PRESS TO CHARGE switch depressed, the charging circuit shall switch to medium rate between 0 and 2 amp hr, the current after 5 minutes shall be 2 to 6 amps and the CHARGING lamp shall illuminate.

  (3) With the red pointer rotated slowly cw, the charging circuit shall switch to high charge between 6 to 10 amp hrs and the charging current after 5 minutes shall be 4 to 10 amps.

  (4) With the 115V removed, the CHARGING lamp shall extinguish.

  (5) With the 115V reapplied, the battery shall be charging at a trickle rate.

  (6) When the PRESS TO CHARGE switch is depressed, the charging circuit shall switch to a high rate and the CHARGING lamp shall illuminate.

  (7) Set the red pointer to 35 amp hr and continue to charge the battery. The charging circuit shall terminate automatically into a trickle rate between 2 and 0 or FULL amp hr. At that time the CHARGING lamp shall extinguish.

b. With the battery fully charged, the individual cell voltages shall be within 50 mv of the total voltage divided by the number of cells.

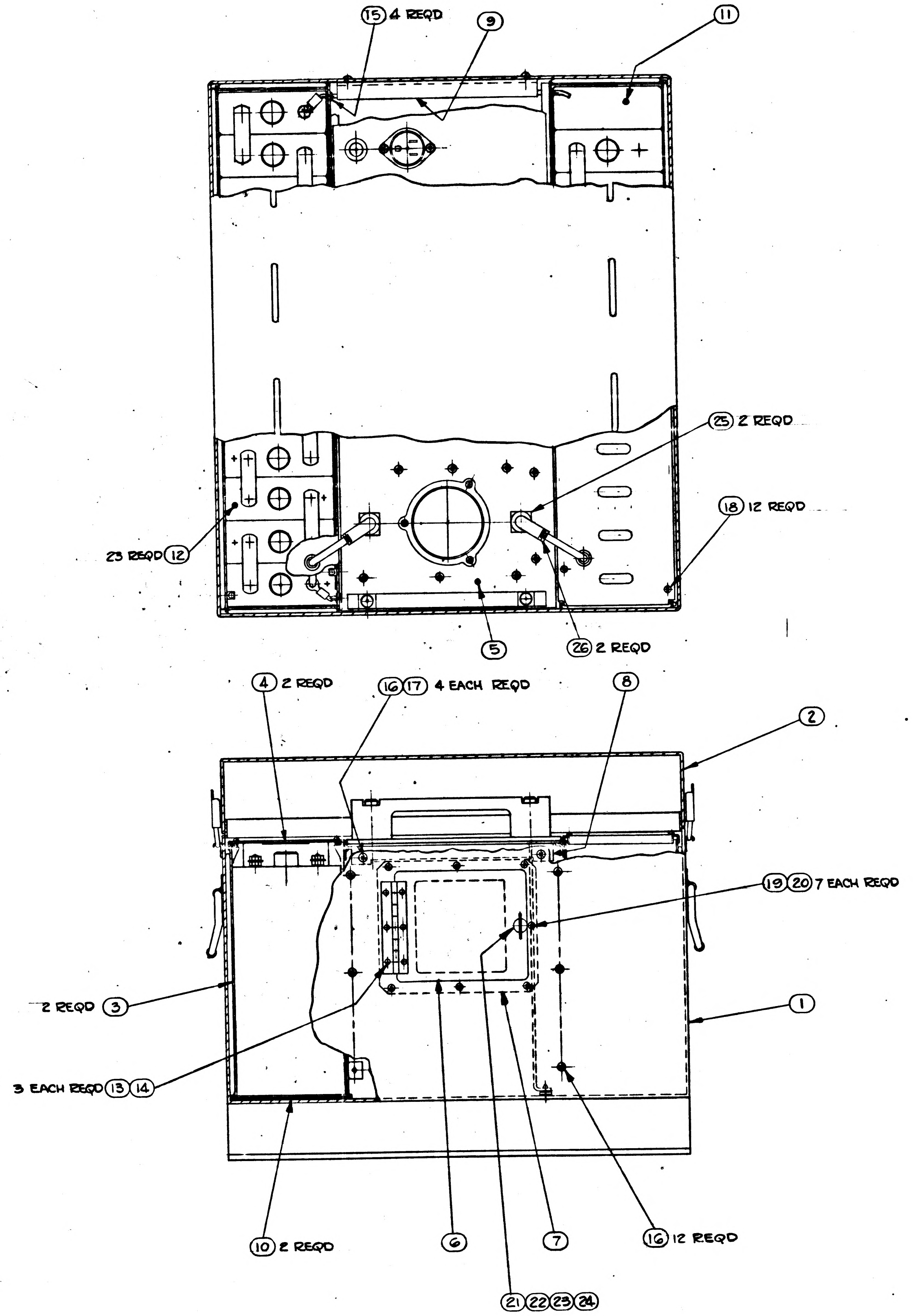
4.2.5.2 Type II. The normal power charge test for Type II equipment shall be performed in the following sequence:

a. With the 100 va load connected between J2-R and J2-U, no power applied, the ICTC POWER switch in the "ON" position, the alarm bell ringing stopped by; actuating the 115V LINE POWER-115V OFF ALARM RESET switch, the INVERTER POWER-INVERTER OFF ALARM RESET switch, and the PTC OPERATING-PTC OFF ALARM RESET switch, as necessary the battery shall be discharged for 1/2 hour, but not below a terminal voltage of 25.3 vdc.

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
G		REPLACES REVISION "F" WITH CHANGE PER MXC-188667 TDR 03425		5 SEP 63	

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. ASSEMBLE PER
3. INSPECT PER

DRAWINGS FOR REFERENCE:
SCHEMATIC DIAGRAM, ELEC
WIRING DIAGRAM



FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01518 DATE 9/17/63
(G) REPLACES REVISION "F" WITH CHANGE PER MXC 188667

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			2		26	MS-3108R-85-15	CONNECTOR, PLUG, ELECTRICAL
			2		25	MS-3102R-85-1P	CONNECTOR, RECEPTACLE, ELECTRICAL
			1		24	1016062-001	WASHER, WEAR
			1		23	1016060-017	STUD, WING HEAD
			1		22	1016061-001	SPRING, EJECTOR
			1		21	1015857-1	WASHER, RETAINER
			7		20	AN363C832	NUT, SELF-LOCKING
			7		19	1006783-28	SCREW, BUTTON HEAD
			12		18	MS35216-27	SCREW, PAN HEAD
			4		17	AN363C1024	NUT, SELF-LOCKING
			16		16	1006783-37	SCREW, BUTTON HEAD
			4		15	MS35489-4	RUBBER GROMMET
			3		14	AN363C632	NUT, SELF-LOCKING
			3		13	1006783-24	SCREW, BUTTON HEAD
			23		12	1015972	CELL, NICKEL CAD
			1		11	1900469	CELL, DUMMY
			2		10	1900468	PAD, RUBBER
			1		9	1900470	ANGLE BRACKET, RIGHT
			1		8	1900467	ANGLE BRACKET, LEFT
			1		7	1900472	BACKPLATE (INSEP) ASSY
			1		6	1900471	DOOR ACCESS (INSEP) ASSY
			1		5	1900473	PANEL ASSY
			2		4	1900464	COVER-BATTERY CASE (INSEP) ASSY
			2		3	1900461	BATTERY CASE (INSEP) ASSY
			1		2	1900460	COVER-BATTERY POWER PACK (INSEP) ASSY
			1		1	1900456	OUTER CASE (INSEP) ASSY

LIST OF PARTS AND MATERIALS

1900011 G

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − − − DECIMALS + − − − ANGLES + − − −
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Orgel DATE 19 JUL 63
CHECKED WILSON 29 JUL 63
APPROVAL 7-29-63
APPROVAL 9/23/63
NASA APPROVAL 9/24/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

CODE IDENT NO. | SIZE E | 1900011
SCALE 1:2 | SHEET OF

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

APOLLO G&N Specification
PS1900011 G

Class A Release
TDRR 18135

PROCUREMENT SPECIFICATION
FOR
BATTERY POWER PACK

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	10395	2-10/ECO-195738			
B	10618	3,7,9,/ECO-196505			
C	10619	6 through 10			
D	14383	8	WK	AM	11-24-64
E	18135	i, 1, 5, 6, 7, 9, 10 & 11	WK	ACM	4/7/65
F	21053	8, 9	WK	ACM	7/21/65
G	22673	8	WK	ACM	9/24/65

This specification consists of page i to iii and 1 to 11 inclusive.

f. Type I: With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER-115V OFF ALARM RESET switch, and the BATTERY fuse removed, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

g. Type I: With the BATTERY fuse replaced, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

h. Type II: With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER-115V OFF ALARM RESET switch, and P4 removed from J4, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

i. Type II: With P4 connected to J4, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

j. With the jumper removed from pins J2-L and J2-M, the PTC OPERATING lamp shall extinguish, the alarm bell shall ring, and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

k. With the jumper replaced between pins J2-L and J2-M, the alarm bell shall ring again. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm shall stop ringing, the PTC OFF ALARM RESET lamp shall extinguish, and the PTC OPERATING lamp shall illuminate.

m. With pins J6-P, J6-d, and J6-e jumpered and J6-E jumpered to J6-F, the NORMAL HEATER POWER lamp shall illuminate. With the jumper removed from J6-d and the EMERGENCY switch pressed, the NORMAL HEATER POWER lamp shall not extinguish. The jumper shall be replaced. With the jumper removed from pins J6-E and J6-F, the NORMAL HEATER POWER lamp shall extinguish and the PTC HEATER POWER lamp shall illuminate.

APOLLO G&N Specification
P81900011 H

Class A Release
TDRR 18135

PROCUREMENT SPECIFICATION
FOR
BATTERY POWER PACK

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	
A	10395	2-10/ECO-195738			
B	10618	3,7,9,/ECO-196505			
C	10619	6 through 10			
D	14383	8	WK	AM	11-24-64
E	18135	i, 1, 5, 6, 7, 9, 10 & 11	WK	ACM	4/7/65
F	21053	8, 9	WK	ACM	7/21/65
G	22673	8	WK	ACM	9/24/65
H	25899	1, 7-9	WK	----	2/3/66

This specification consists of page i to iii and 1 to 11 inclusive.

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Battery Power Pack, hereafter called the battery pack.

1.2 CLASSIFICATION. This specification covers the requirements for the following types of equipment. Unless identified by the respective type, all requirements of this specification are applicable for all types.

a. Type I: The requirements for part number 1900011-011 shall be designated as Type I.
b. Type II: The requirements for part number 1900011-021 shall be designated as Type II.
c. Type III: The requirements for part number 1900011-031 shall be designated as Type III.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of invitations for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

APOLLO G&N

ND-1002018	General Specification for APOLLO Ground Support Equipment
ND-1002023	Procedure for Serialization of Components, Assemblies, etc., for APOLLO Guidance and Navigation Equipment
ND-1002214	General Specification for Preservation, Packing and Container Marking of APOLLO Guidance and Navigation Major Assemblies, Assemblies, Subassemblies, Parts and Associated Ground Support Equipment
ND-1015404	General Specification, Configuration, Process and Quality Control Requirements for Suppliers of High Reliability Articles for Use in Spacecraft and Supporting Equipment

DRAWINGS

APOLLO G&N

1900011	Battery Power Pack

TABLE I (Continued)

CONTINUITY

TERMINAL PINS		RESISTANCE	CONDITIONS
From	To	(ohms)	
J3-J	J5-E	<1	
J1-D	J5-E	↑	
J5-D	J6-P		
J5-D	J6-R		
J5-A	J5-B		
J5-G	J5-F	*3	
J1-B	J5-E		
J3-J	J4-M		
J3-J	J4-R		
J2-U	J4-F		
J2-M	J4-D		
J4-B	J6-Y		
J4-C	P1-B		
J4-C	J6-F	↓	ICTC POWER switch "ON" *1
J4-H	P1-A	<1	
J5-H	J5-G	100K min *3	
J4-C	J6-F	100K min	ICTC POWER switch "ON" *2
*1 Type I only. *2 Type II and Type III only. *3 Type III only.			

4.2.4 Normal and Alarm Function. With a nominal 20VA load, the external portion defined as 775±1 percent ohms is parallel with 3.33±5 percent henries, connected between pins J2-U and J2-R and pins J2-L and J2-M jumpered, the normal and alarm function test shall be performed as follows:

a. With 115V applied to pins P1-A (Hi) and P1-B (Lo), the ICTC POWER switch in the "ON" position, and the 115V OFF ALARM RESET and PTC OFF ALARM RESET switches alternately pressed, the alarm shall stop ringing. For Type III equipment only, a resistance of <1 ohm shall exist between pins J5-H and J5-G.

b. With 115V removed from pins P1-A (Hi) and P1-B (Lo) and the 115V OFF ALARM RESET switch pressed, the alarm bell may stop ringing. If the alarm bell continues to ring, pressing the INVERTER OFF ALARM RESET switch shall stop it.

c. With 115.0±11.5V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo) and the ICTC POWER switch in the "OFF" position, the PRESS TO CHARGE lamp shall illuminate. With the ICTC POWER switch in the "ON" position, the 115V LINE POWER and PTC OPERATING lamps shall illuminate and 115.0±11.5 vac shall appear between pins J2-U (Hi) and J2-R (Lo). No amber or red lamps (alarm reset lamps) shall illuminate.

d. With the power removed from the pins specified in 4.2.4.a, the alarm bell shall ring and the 115V OFF ALARM RESET, INVERTER POWER, and BATTERY IN USE lamps shall illuminate. With the 115V LINE POWER—115V OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the 115V OFF ALARM RESET, INVERTER POWER, PTC OPERATING, and BATTERY IN USE lamps shall remain illuminated.

e. With the power reapplied to the pins specified in 4.2.4.a, the alarm bell shall ring again. With the 115V LINE POWER— 115V OFF ALARM RESET switch actuated, the alarm bell shall stop ringing, the 115V OFF ALARM RESET, INVERTER POWER, and BATTERY IN USE lamps shall extinguish and the 115V LINE POWER lamp shall illuminate.

f. Type I: With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER—115V OFF ALARM RESET switch, and the BATTERY fuse removed, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

g. Type I: With the BATTERY fuse replaced, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

h. Type II and Type III: With the power removed from the pins specified in 4.2.4.a, the alarm bell ringing stopped by actuating the 115V LINE POWER-115V OFF ALARM RESET switch, and P4 removed from J4, the INVERTER POWER and the PTC operating lamps shall extinguish, the alarm bell shall ring, the INVERTER OFF ALARM RESET lamps shall illuminate, and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OPERATING PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing; however, the INVERTER OFF ALARM RESET lamp shall remain illuminated and the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

i. Type II and Type III: With P4 connected to J4, the alarm bell shall ring again. With the INVERTER POWER-INVERTER OFF ALARM RESET and PTC OFF ALARM RESET switches actuated, the alarm bell shall stop ringing, the INVERTER OFF ALARM RESET and PTC OFF ALARM RESET lamps shall extinguish, and the INVERTER POWER and PTC OPERATING lamps shall illuminate.

j. With the jumper removed from pins J2-L and J2-M, the PTC OPERATING lamp shall extinguish, the alarm bell shall ring, and the PTC OFF ALARM RESET lamp shall illuminate and extinguish intermittently. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm bell shall stop ringing; however, the PTC OFF ALARM RESET lamp shall continue to illuminate and extinguish intermittently.

k. With the jumper replaced between pins J2-L and J2-M, the alarm bell shall ring again. With the PTC OPERATING-PTC OFF ALARM RESET switch actuated, the alarm shall stop ringing, the PTC OFF ALARM RESET lamp shall extinguish, and the PTC OPERATING lamp shall illuminate.

m. With pins J6-P, J6-d, and J6-e jumpered and J6-E jumpered to J6-F, the NORMAL HEATER POWER lamp shall illuminate. With the jumper removed from J6-d and the EMERGENCY switch pressed, the NORMAL HEATER POWER lamp shall not extinguish. The jumper shall be replaced. With the jumper removed from pins J6-E and J6-F, the NORMAL HEATER POWER lamp shall extinguish and the PTC HEATER POWER lamp shall illuminate.

n. With the EMERGENCY switch actuated, the 115V OFF ALARM RESET, PTC HEATER POWER, INVERTER POWER, and PTC OPERATING lamps shall extinguish, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall illuminate, and 23 to 35 vdc shall appear between pins J6-N (Hi) and J6-P (Lo). With the EMERGENCY HEATER POWER PRESS TO TURN OFF switch actuated, the EMERGENCY HEATER POWER PRESS TO TURN OFF lamp shall extinguish and 23 to 35 vdc shall disappear from pins J6-N (Hi) and J6-P (Lo). The alarm shall not ring in either switchover. The 115V OFF ALARM RESET, PTC HEATER POWER, PTC OPERATING, and INVERTER POWER lamps shall illuminate.

o. Repeat 4.2.4.n, except, momentarily jumper pins J5-D and J5-E instead of actuating the EMERGENCY switch.

4.2.5 Normal Power Charge. The normal power charge test shall be performed as follows for the respective types of equipment. The charging period may be interrupted. If line power is lost during the charge cycle, the PRESS TO CHARGE switch shall be pressed to continue charge.

4.2.5.1 Type I. The normal power charge test for Type I equipment shall be performed in the following sequence:

a. With 115.0±11.5V, 60±3 applied to pins P1-A (Hi) and P1-B (Lo), and the ICTC POWER switch in the "OFF" position, the inner dial of the AHM set to 35 amp hr, the pointer of the AHM set to 0 amp hr, the PRESS TO CHARGE lamp shall illuminate.

    (1) With the red pointer of the AHM at the "FULL" position, the charging current as measured between pins J3-A (Hi) and P3-A shall be 5 to 50 ma after 5 minutes.

    (2) With the red pointer rotated slowly cw and the PRESS TO CHARGE switch depressed, the charging circuit shall switch to medium rate between 0 and 2 amp hr, the current after 5 minutes shall be 2 to 6 amps and the CHARGING lamp shall illuminate.

    (3) With the red pointer rotated slowly cw, the charging circuit shall switch to high charge between 6 to 10 amp hrs and the charging current after 5 minutes shall be 4 to 10 amps.

    (4) With the 115V removed, the CHARGING lamp shall extinguish.

    (5) With the 115V reapplied, the battery shall be charging at a trickle rate.

    (6) When the PRESS TO CHARGE switch is depressed, the charging circuit shall switch to a high rate and the CHARGING lamp shall illuminate.

    (7) Set the red pointer to 35 amp hr and continue to charge the battery. The charging circuit shall terminate automatically into a trickle rate between 2 and 0 or FULL amp hr. At that time the CHARGING lamp shall extinguish.

b. With the battery fully charged, the individual cell voltages shall be within 50 mv of the total voltage divided by the number of cells.

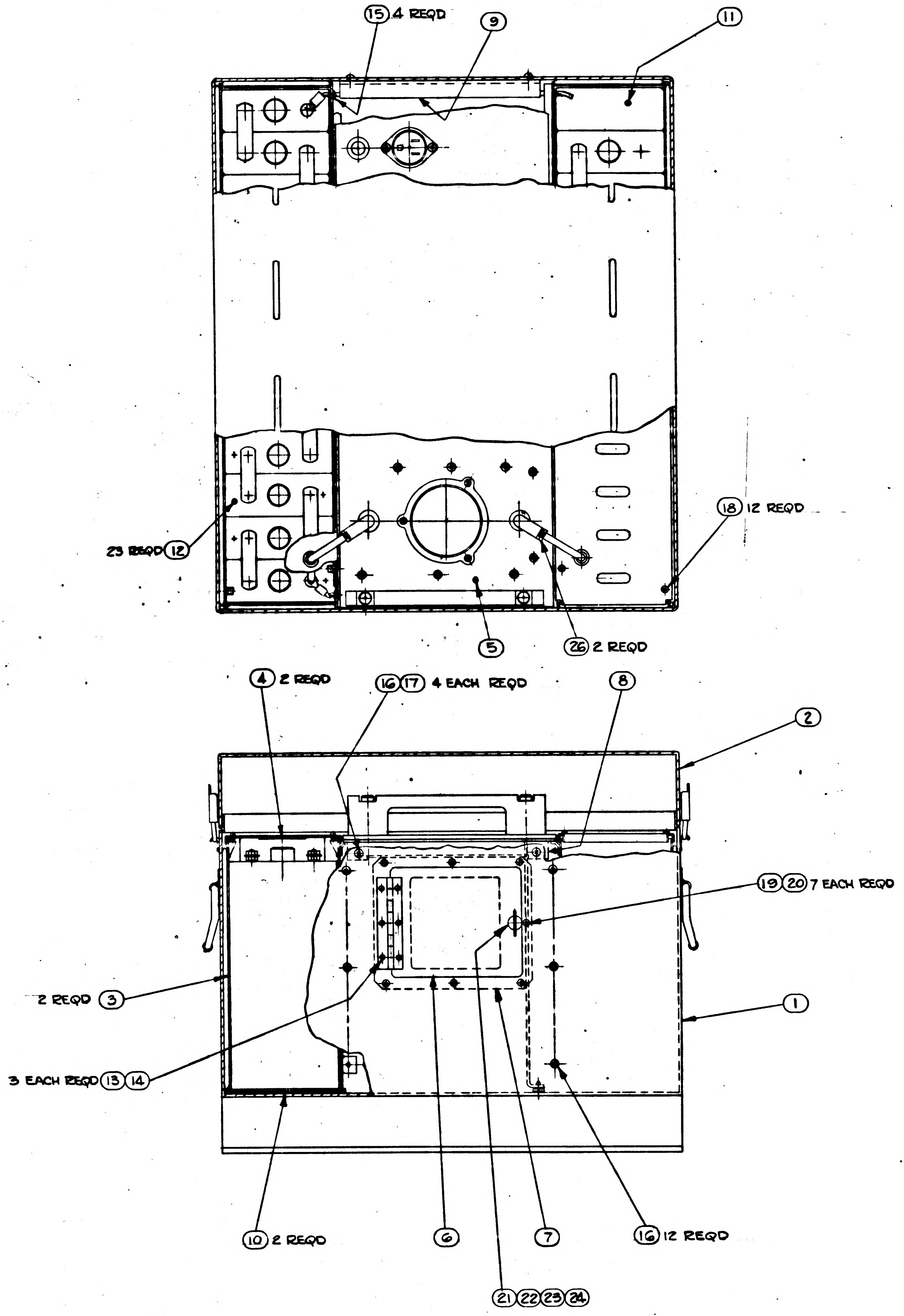
4.2.5.2 Type II and Type III. The normal power charge test for Type II and Type III equipment shall be performed in the following sequence:

a. With the 100 va load connected between J2-R and J2-U, no power applied, the ICTC POWER switch in the "ON" position, the alarm bell ringing stopped by; actuating the 115V LINE POWER-115V OFF ALARM RESET switch, the INVERTER POWER-INVERTER OFF ALARM RESET switch, and the PTC OPERATING-PTC OFF ALARM RESET switch, as necessary the battery shall be discharged for 1/2 hour, but not below a terminal voltage of 25.3 vdc.

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. ASSEMBLE PER
3. INSPECT PER

DRAWINGS FOR REFERENCE:
SCHEMATIC DIAGRAM, ELEC
WIRING DIAGRAM

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
ⓖ G		REPLACES REVISION "F" WITH CHANGE PER MXC-188667 TDR 03		5 SEP 63	
H	E4	REMOVED ITEM 25 (2) P/N MS-3102R-8S-1P & ASSOC INFO., PER MXC-189088		6 OCT 63	
J		REPLACED WITH CHANGE BY REV "K" PER MXC 190348 PER TDRR 062		18 OCT 63	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01518 DATE 8/12/63

Ⓖ REPLACES REVISION "F" WITH CHANGE PER MXC 188667

Ⓙ REPLACED WITH CHANGE BY REV "K"

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2		26	MS-3108R-8S-1S	CONNECTOR, PLUG, ELECTRICAL
			1		24	1016062-001	WASHER, WEAR
			1		23	1016060-017	STUD, WING HEAD
			1		22	1016061-001	SPRING, EJECTOR
			1		21	1015857-1	WASHER, RETAINER
			7		20	AN363C832	NUT, SELF-LOCKING
			7		19	1006783-28	SCREW, BUTTON HEAD
			12		18	MS35216-27	SCREW, PAN HEAD
			4		17	AN363C1024	NUT, SELF-LOCKING
			16		16	1006783-37	SCREW, BUTTON HEAD
			4		15	MS35489-4	RUBBER GROMMET
			3		14	AN363C632	NUT, SELF-LOCKING
			3		13	1006783-24	SCREW, BUTTON HEAD
			23		12	1015972	CELL, NICKEL CAD
			1		11	1900469	CELL, DUMMY
			2		10	1900468	PAD, RUBBER
			1		9	1900470	ANGLE BRACKET, RIGHT
			1		8	1900467	ANGLE BRACKET, LEFT
			1		7	1900472	BACKPLATE (INSEP) ASSY
			1		6	1900471	DOOR ACCESS (INSEP) ASSY
			1		5	1900473	PANEL ASSY
			2		4	1900464	COVER-BATTERY CASE (INSEP) ASSY
			2		3	1900461	BATTERY CASE (INSEP) ASSY
			1		2	1900460	COVER-BATTERY POWER PACK (INSEP) ASSY
			1		1	1900456	OUTER CASE (INSEP) ASSY
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Ozgal DATE 19 JUL 63
CHECKED WILSON 29 JUL 63
APPROVAL 7-29-63
APPROVAL 9/23/63
NASA APPROVAL 9/24/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

CODE IDENT NO. SIZE E 1900011
SCALE 1:2 SHEET OF

1900011

PROCUREMENT SPECIFICATION

FOR

BATTERY POWER PACK

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Battery Power Pack, hereafter called the battery pack.

1.2 CLASSIFICATION. This specification covers the requirements for the following types of equipment. Unless identified by the respective type, all requirements of this specification are applicable for all types.

a. Type I: The requirements for part number 1900011-011 shall be designated as Type I.
b. Type II: The requirements for part number 1900011-021 shall be designated as Type II.
c. Type III: The requirements for part number 1900011-031 shall be designated as Type III.
d. Type IV: The requirements for part numbers 1900011-041 and -051 shall be designated as Type IV.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of invitations for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

APOLLO G&N

ND-1002018	General Specification for APOLLO Ground Support Equipment
ND-1002023	Procedure for Serialization of Components, Assemblies, etc., for APOLLO Guidance and Navigation Equipment
ND-1002214	General Specification for Preservation, Packing and Container Marking of APOLLO Guidance and Navigation Major Assemblies, Assemblies, Subassemblies, Parts and Associated Ground Support Equipment
ND-1015404	General Specification, Configuration, Process and Quality Control Requirements for Suppliers of High Reliability Articles for Use in Spacecraft and Supporting Equipment

DRAWINGS

APOLLO G&N

1900011	Battery Power Pack

(7) Set the red pointer to 35 amp hr and continue to charge the battery. The charging circuit shall terminate automatically into a trickle rate between 2 and 0 or FULL amp hr. At that time the CHARGING lamp shall extinguish.

b. With the battery fully charged, the individual cell voltages shall be within 50 mv of the total voltage divided by the number of cells.

4.2.5.2 Type II, Type III and Type IV. The normal power charge test for Type II, Type III and Type IV equipment shall be performed in the following sequence:

a. With the 100 va load connected between J2-R and J2-U, no power applied, the ICTC POWER switch in the "ON" position, the alarm bell ringing stopped by actuating the 115V LINE POWER-115V OFF ALARM RESET switch, the INVERTER POWER-INVERTER OFF ALARM RESET switch, and the PTC OPERATING-PTC OFF ALARM RESET switch, as necessary the battery shall be discharged for 1/2 hour, but not below a terminal voltage of 25.3 vdc.

b. With 115.0±2.0V, 60±3 cps applied to pins P1-A (Hi) and P1-B (Lo), the ICTC switch in the "OFF" position, the inner dial of the AHM set to 35 amp hr for Types II and III (30 amp hr for Type IV) and the pointer of the AHM set to 0 amp hr, the PRESS TO CHARGE lamp shall illuminate.

(1) With the red pointer of the AHM set at the "FULL" position, the charging current as measured between pins J3-A (Hi) and P3-A shall be 5 to 50 ma after 5 minutes.

(2) With the PRESS TO CHARGE switch depressed and the red pointer of the AHM rotated slowly cw, the charging circuit shall switch to a high rate between 0 and 2 amp hr and the CHARGING lamp shall illuminate. The plateau current shall be 4 to 8 amps and the plateau voltage shall be 30.5 to 33.5 vdc. Set the red pointer to 35 amp hr for Types II and III or 30 amp hr for Type IV.

(3) With the 115V removed, the CHARGING lamp shall extinguish.

(4) With the 115V reapplied, the battery shall be charging at a trickle rate.

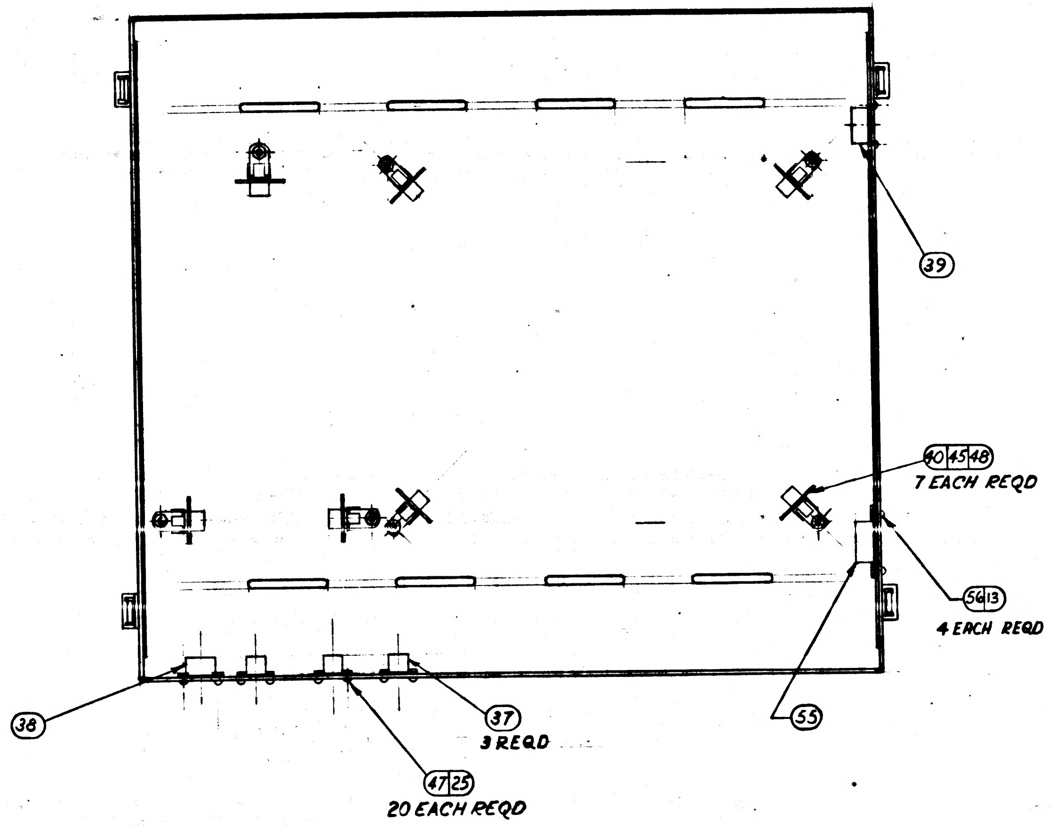
(5) When the PRESS TO CHARGE switch is depressed, the charging circuit shall switch to a high rate and the CHARGING lamp shall illuminate.

(6) As the battery terminal voltage rises above 34 vdc, the current shall decrease (3 amps minimum). At 37±1 vdc the current shall rise sharply. The plateau current shall be 4 to 10 amps and the plateau voltage shall be 37 to 41 vdc. Set the red pointer to 20 amp hr and continue to charge the battery.

(7) The charging circuit shall terminate automatically into a trickle rate between 0 and 2 amp hr or FULL. At that time the CHARGING lamp shall extinguish.

1900011
SH 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K		REPLACES REV."J" WITH CHANGE PER MXC 90348 REVISED PER TDR 06285		13 ?? 63	
M		CHANGE IN ACCORDANCE WITH MXC-191045		20 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764 PER TDRR 06291		30 DEC 63	J.E.L.



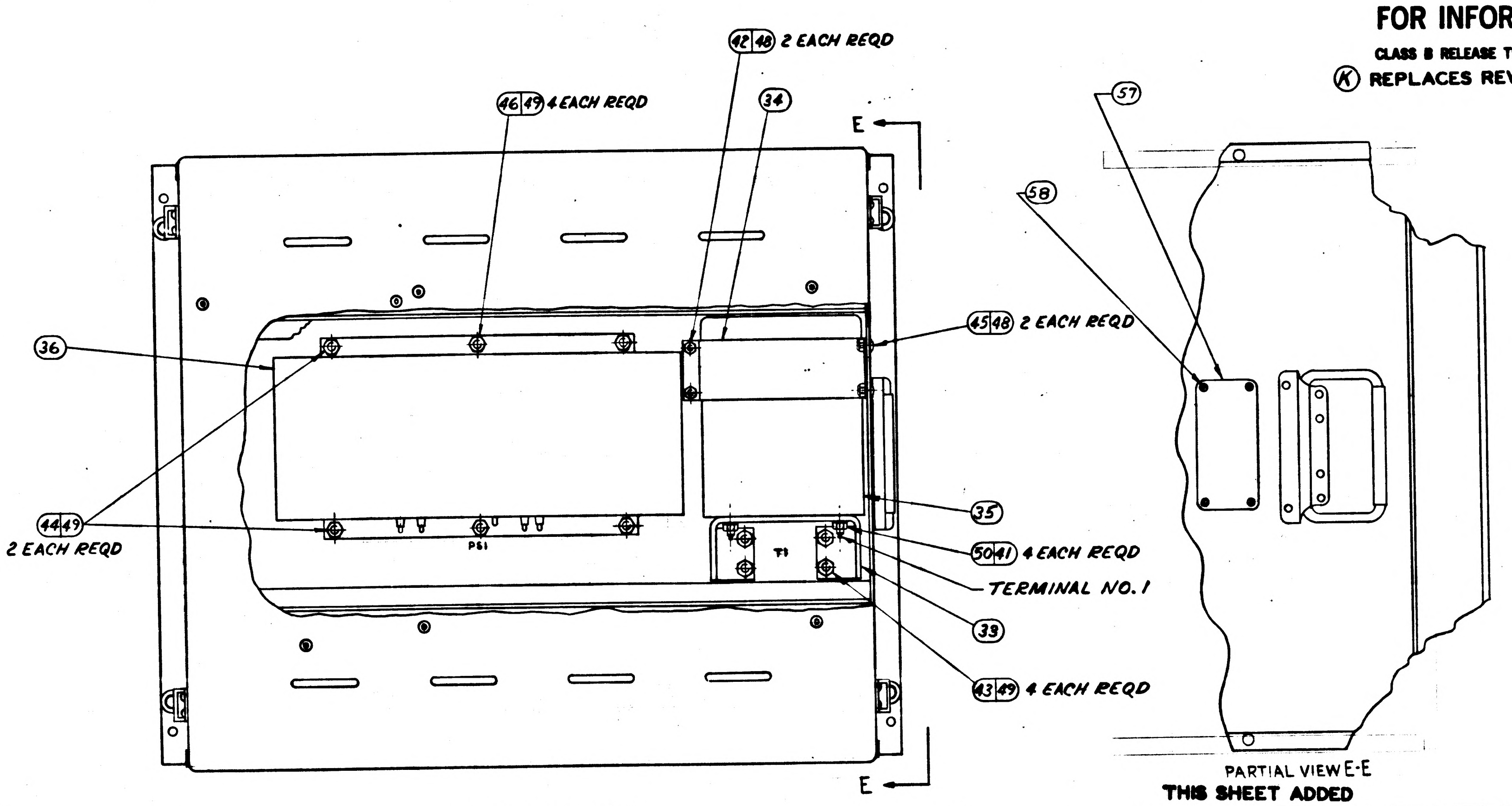
39
40 45 48
7 EACH REQD
56 13
4 EACH REQD
38
37
3 REQD
55
47 25
20 EACH REQD

INSIDE VIEW OF COVER ITEM 2 (REF)

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01518 6/12/63 DATE

Ⓚ REPLACES REV"J" WITH CHANGE



42 48 2 EACH REQD
46 49 4 EACH REQD
34
E
36
45 48 2 EACH REQD
44 49
2 EACH REQD
35
PS1
T1
50 41 4 EACH REQD
TERMINAL NO. 1
33
43 49 4 EACH REQD
E
57
58

PARTIAL VIEW D-D

PARTIAL VIEW E-E

THIS SHEET ADDED

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
- — - — - —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 9 SEP 63 DATE
CHECKED WILSON 18 SEP 63
APPROVAL 18 Sep 63
APPROVAL 2/11/64
NASA APPROVAL
MIT APPROVAL 11 Feb 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

CODE IDENT NO. SIZE E 1900011
SCALE 1:2 SHEET 2 OF 2

1900011
SH 2

INCHES
PHOTOGRAPHIC SCALE ONLY

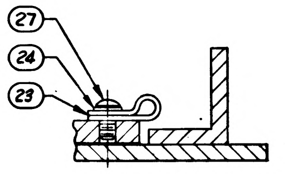
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01518 DATE 6/12/63

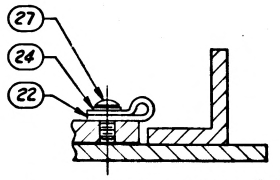
Ⓚ REPLACES REV "J" WITH CHANGE

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K		ADDED SHEET-2 REPLACES REV. "J" WITH CHANGE PER MXC 190348 REVISED PER TDR 06215		3 OCT 63 3-1-64	[illegible]
L		CHANGE IN ACCORDANCE WITH MXC-190602		26 DEC 63	J.E.L.
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
N		CHANGE IN ACCORDANCE WITH MXC-191345		27 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764		30 DEC 63	J.E.L.
R		CHANGE IN ACCORDANCE WITH MXC-192010		3 JAN 64	J.E.L.
S		CHANGE IN ACCORDANCE WITH MXC-192485		6 JAN 64	J.E.L.
T		CHANGE IN ACCORDANCE WITH CM 192960 PER TDRR 06291		JAN 64	J.E.

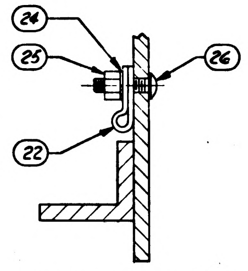
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. ASSEMBLE PER ND
3. INSPECT PER ND
4. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52.
6. ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE(+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 IN ACCORDANCE WITH ND 1002023, LETTERS AND NUMERALS TO BE .12 HIGH.



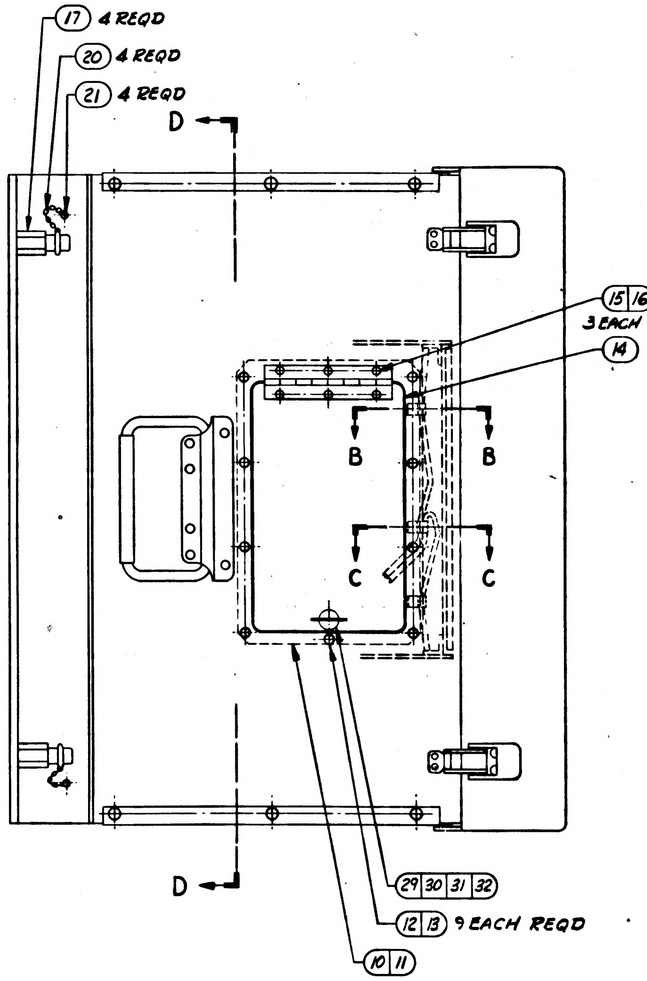
PARTIAL SECTION C-C
SCALE 2:1

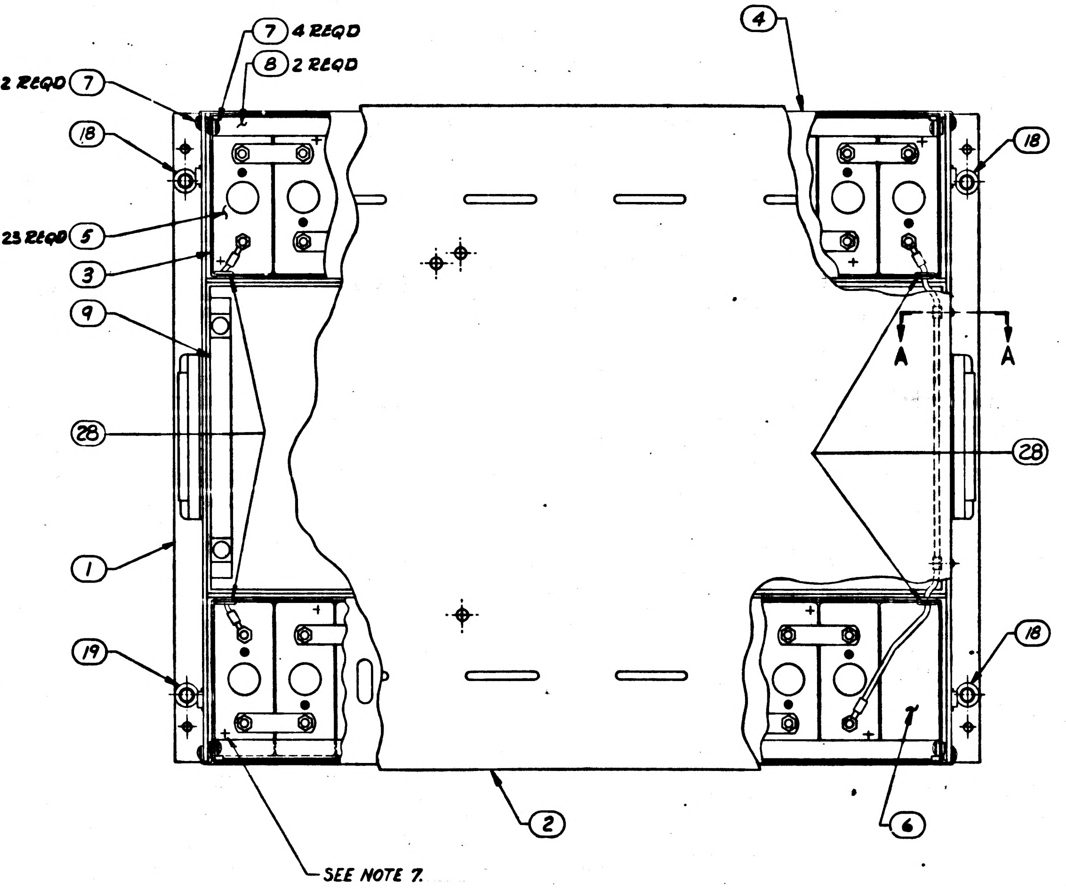


PARTIAL SECTION B-B
TWO PLACES
SCALE 2:1



PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1





				011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 4&5				1		61	1015818-90	CONNECTOR
				1		60	1900955	CABLE, ELEC, INTERCONNECT, W100 (BPP TO PTC)
				1		59	1900954	CABLE, ELEC., INTERCONNECT, W101 (BPP TO IMU)
				4		58	AN535-0-3	(1897109-103) SCREW, DRIVE
				1		57	1901304-208	NAMEPLATE
				4		56	1006873-27	SCREW, MACHINE
				1		55	MS3105-32	DUMMY RECEPTACLE
				X		54	1900559	WIRING DIAGRAM
				1		53	1900903	WIRE LIST BB
				1		52	1900923	WIRING HARNESS B
				X		51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
				4		50	AN335-4	NUT, PLAIN HEX
				10		49	AN363C428	NUT, SELF-LOCKING
				11		48	AN363C1032	NUT, SELF-LOCKING
				16		47	1006783-19	SCREW, MACHINE
				4		46	1006783-57	SCREW, MACHINE
				9		45	1006783-44	SCREW, MACHINE
SEE NOTE 4				2		44	1015826-407	SCREW, MACHINE
SEE NOTE 4				4		43	1015826-411	SCREW, MACHINE
SEE NOTE 4				2		42	1015826-304	SCREW, MACHINE
				4		41	MS35338-82	WASHER, LOCK
SEE NOTE 4				7		40	1016105-004	CLAMP
SEE NOTE 4				1		39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4				1		38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4				3		37	1016073-123	DUMMY RECEPTACLE
				1		36	1900158	INVERTER, STATIC
SEE NOTE 4				1		35	1015953	TRANSFORMER, POWER
				1		34	1900795	BRACKET, TRANSFORMER HOLD DOWN
				1		33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4				1		32	1016062-001	WASHER, WEAR
SEE NOTE 4				1		31	1016060-017	STUD, WING HEAD
SEE NOTE 4				1		30	1016061-001	SPRING, EJECTOR
SEE NOTE 4				1		29	1015857-1	WASHER, RETAINER
				4		28	MS35489-6	GROMMET, RUBBER
SEE NOTE 4				3		27	1006783-18	SCREW, MACHINE
				2		26	1006783-20	SCREW, MACHINE
SEE NOTE 4				18		25	1010617-4	NUT, SELF-LOCKING
				5		24	AN960-C4L	WASHER, FLAT
SEE NOTE 4				1		23	1015985-201	CABLE CLAMP
SEE NOTE 4				4		22	1015985-203	CABLE CLAMP
				4		21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4				4		20	1016067-003	CHAIN SAFETY
SEE NOTE 4				1		19	1016065-013	PIN, QUICK RELEASE
SEE NOTE 4				3		18	1016065-011	PIN, QUICK RELEASE
				4		17	1900773	RETAINER, PIN
				3		16	AN363C632	NUT, SELF-LOCKING
				3		15	1006783-24	SCREW, MACHINE
				1		14	1900471	DOOR, ACCESS (INSEP) ASSY
				13		13	AN363C832	NUT, SELF-LOCKING
				9		12	1006783-28	SCREW, MACHINE
				1		11	1900818	GASKET, BACKPLATE (RF)
				1		10	1900472	BACKPLATE (INSEP) ASSY
				1		9	1900473	PANEL ASSY
				2		8	1900822	CLAMP, BATTERY
				16		7	1006783-42	SCREW, MACHINE
				1		6	1015972-002	BATTERY, STORAGE
				23		5	1015972-001	CELL, NICKEL CADMIUM
				2		4	1900464	BATTERY COVER (INSEP) ASSY
				2		3	1900461	BATTERY CASE (INSEP) ASSY
				1		2	1900460	COVER, BATTERY POWER PACK
				1		1	1900456	CASE, BATTERY POWER PACK

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
T	P
S	P
R	P
P	P
N	M
M	M
L	K
K	K

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900011-011	1900030-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. Sommer DATE 9 SEP 63
CHECKED Wilson 18 SEP 63
APPROVAL 18 Sep 63
APPROVAL 2/1/64
NASA APPROVAL
MIT APPROVAL 1/1/64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

CODE IDENT NO. SIZE E 1900011
SCALE 1:2 SHEET 1 OF 2

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1900011
SHT 1 OF 2

FOR INFORMATION ONLY

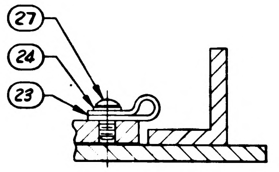
CLASS B RELEASE TDR No. 01518 DATE 6/12/63

Ⓚ REPLACES REV J WITH CHANGE

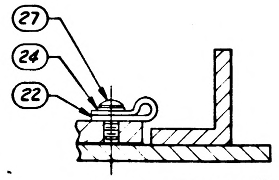
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
K		ADDED SHEET-2 REPLACES REV. "J" WITH CHANGE PER MXC 190348 REVISED PER TDR 06215		8 OCT 63 2-66	RW
L		CHANGE IN ACCORDANCE WITH MXC-190602		20 DEC 63	J.E.L.
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
N		CHANGE IN ACCORDANCE WITH MXC-191345		27 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764		30 DEC 63	J.E.L.
R		CHANGE IN ACCORDANCE WITH MXC-192010		3 JAN 64	J.E.L.
S		CHANGE IN ACCORDANCE WITH MXC-192485		6 JAN 64	J.E.L.
T		CHANGE IN ACCORDANCE WITH CM 192406 PER TDRC 06-91		7 JAN 64	J.E.L.
U		CHANGE IN ACCORDANCE WITH CM 195054		24 FEB 64	
V		CHANGE IN ACCORDANCE WITH CM 196083		16 MAR 64	
W		CHANGE IN ACCORDANCE WITH CM 196168 PER TDRR 08220		27 MAR 64	J.K.

NOTES:

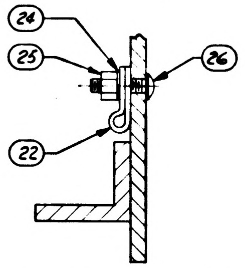
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2.
3.
4. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52.
6. ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE(+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 IN ACCORDANCE WITH ND 1002023, LETTERS AND NUMERALS TO BE .12 HIGH.
9. MARK APPLICABLE REVISION LETTER (REV) PER ND 1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.



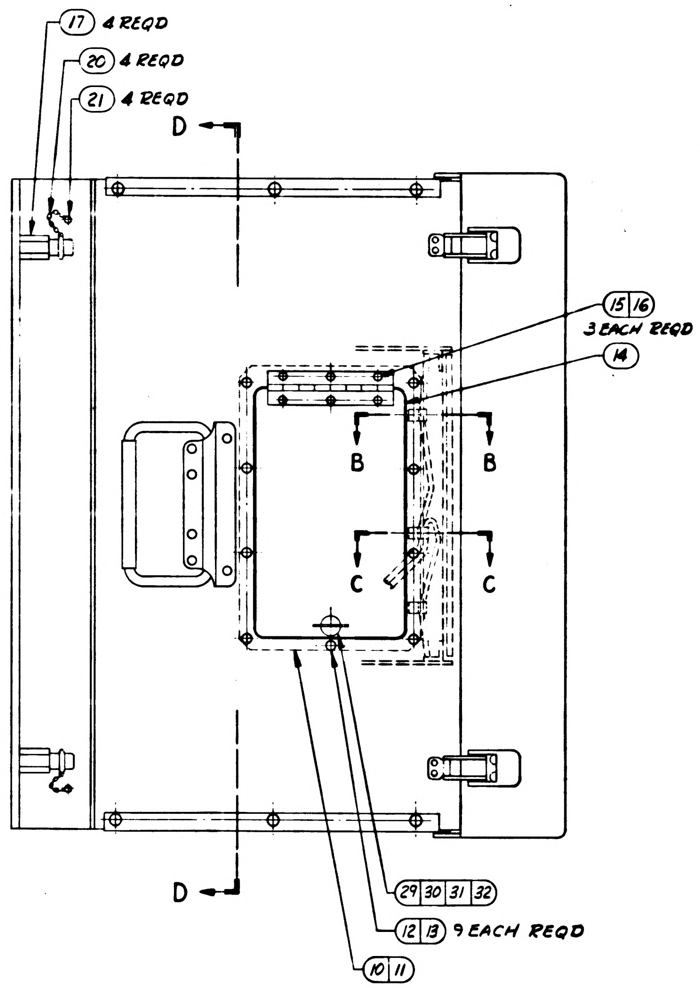
PARTIAL SECTION C-C
SCALE 2:1

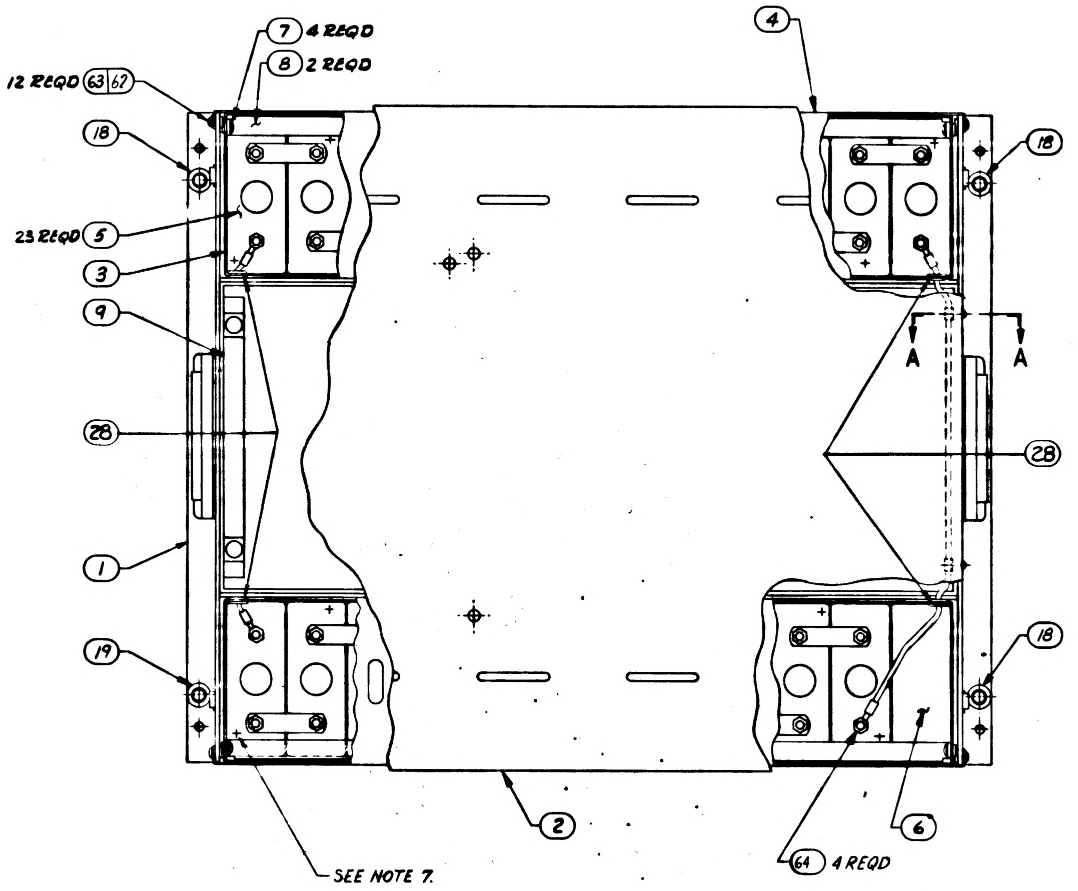


PARTIAL SECTION B-B
TWO PLACES
SCALE 2:1



PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1





				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 4				4		64	1015902-50	TERMINAL LUG
SEE NOTE 4				12		63	1006783-23	SCREW, MACHINE
				12		62	AN 960-C10L	(1897006-017) WASHER - FLAT
SEE NOTE 4 & 5				1		61	1015818-90	CONNECTOR
				1		60	1900955	CABLE, ELEC, INTERCONNECT, W100 (BPP TO PTC)
				1		59	1900954	CABLE, ELEC., INTERCONNECT, W101 (BPP TO IMC)
				4		58	AN535-0-3	(1897109-103) SCREW, DRIVE
				1		57	1901304-208	NAMEPLATE
				4		56	1006873-27	SCREW, MACHINE
				1		55	MS3105-32	DUMMY RECEPTACLE
				X		54	1900559	WIRING DIAGRAM
				1		53	1900903	WIRE LIST BB
				1		52	1900923	WIRING HARNESS B
				X		51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
				4		50	AN335-4	NUT, PLAIN HEX
				10		49	AN363C428	NUT, SELF-LOCKING
				11		48	AN363C1032	NUT, SELF-LOCKING
				16		47	1006783-19	SCREW, MACHINE
				4		46	1006783-57	SCREW, MACHINE
				9		45	1006783-44	SCREW, MACHINE
SEE NOTE 4				2		44	1015826-407	SCREW, MACHINE
SEE NOTE 4				4		43	1015826-411	SCREW, MACHINE
SEE NOTE 4				2		42	1015826-304	SCREW, MACHINE
				4		41	MS35338-82	WASHER, LOCK
SEE NOTE 4				7		40	1016105-004	CLAMP
SEE NOTE 4				1		39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4				1		38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4				3		37	1016073-123	DUMMY RECEPTACLE
				1		36	1900158	INVERTER, STATIC
SEE NOTE 4				1		35	1015953	TRANSFORMER, POWER
				1		34	1900795	BRACKET, TRANSFORMER HOLD DOWN
				1		33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4				1		32	1016062-001	WASHER, WEAR
SEE NOTE 4				1		31	1016060-017	STUD, WING HEAD
SEE NOTE 4				1		30	1016061-001	SPRING, EJECTOR
SEE NOTE 4				1		29	1015857-1	WASHER, RETAINER
				4		28	MS 35489-6	GROMMET, RUBBER
SEE NOTE 4				3		27	1006783-18	SCREW, MACHINE
				2		26	1006783-20	SCREW, MACHINE
SEE NOTE 4				22		25	1016151-004	NUT, SELF-LOCKING
				5		24	AN960-C4L	WASHER, FLAT
SEE NOTE 4				1		23	1015985-201	CABLE CLAMP
SEE NOTE 4				4		22	1015985-203	CABLE CLAMP
				4		21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4				4		20	1016067-003	CHAIN SAFETY
SEE NOTE 4				1		19	1016065-013	PIN, QUICK RELEASE
SEE NOTE 4				3		18	1016065-011	PIN, QUICK RELEASE
				4		17	1900773	RETAINER, PIN
				3		16	AN363C632	NUT, SELF-LOCKING
				3		15	1006783-24	SCREW, MACHINE
				1		14	1900471	DOOR, ACCESS (INSEP) ASSY
				13		13	AN363C832	NUT, SELF-LOCKING
				9		12	1006783-28	SCREW, MACHINE
				1		11	1900818	GASKET, BACKPLATE (RFI)
				1		10	1900472	BACKPLATE (INSEP) ASSY
				1		9	1900473	PANEL ASSY
				2		8	1900822	CLAMP, BATTERY
				4		7	1006783-42	SCREW, MACHINE
				1		6	1015972-002	BATTERY, STORAGE
				23		5	1015972-C01	CELL NICKEL CADMIUM
				2		4	1900464	BATTERY COVER (INSEP) ASSY
				2		3	1900461	BATTERY CASE (INSEP) ASSY
				1		2	1900460	COVER, BATTERY POWER PACK
				1		1	1900456	CASE, BATTERY POWER PACK

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
W	W
V	P
U	P
T	P
S	P
R	P
P	P
N	M
M	M
L	K
K	K

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900011-011	1900030-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Sommer DATE 9 SEP 63
CHECKED WILSON 18 SEP 63
APPROVAL 18 Sep 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

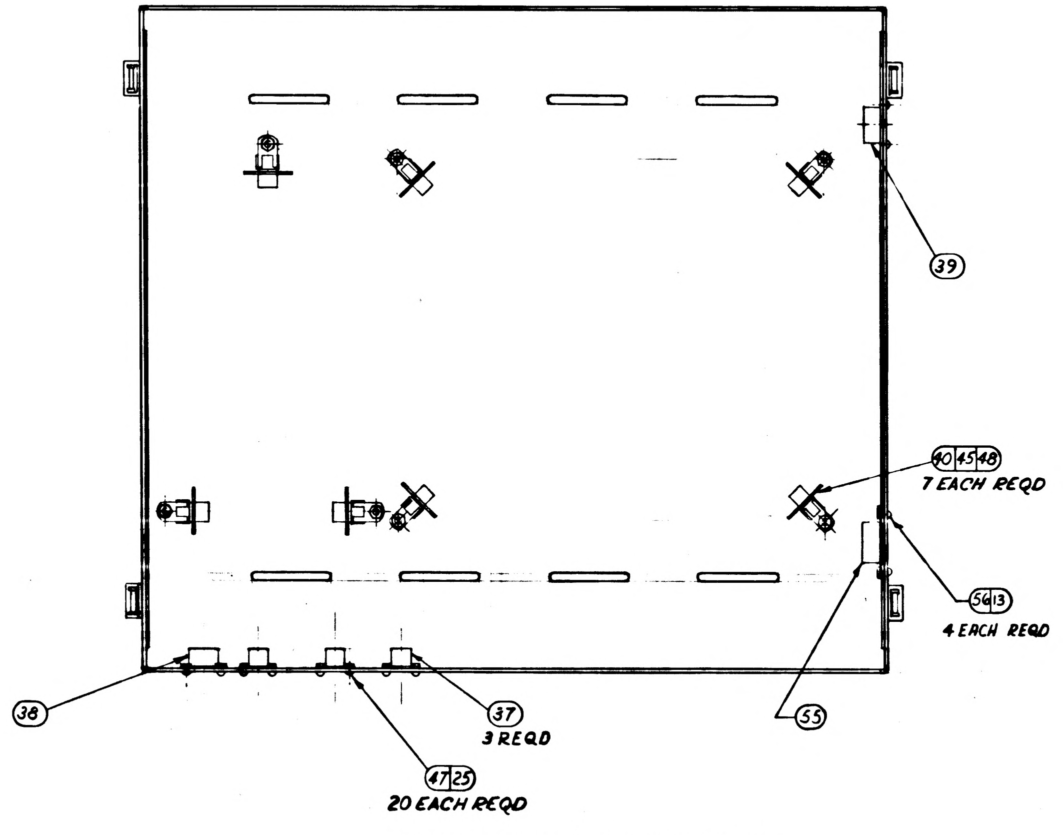
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK ASSEMBLY

CODE IDENT NO. SIZE E 1900011
SCALE 1:2 SHEET 1 OF 2

1900011 SHT 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
K		REPLACES REV."J" WITH CHANGE PER MXC 90348 REVISED PER TDR C-285		15 63	
M		CHANGE IN ACCORDANCE WITH MXC-191C45		26 DEC 63	J.E.L
P		CHANGE IN ACCORDANCE WITH MXC-191764 PER TDRR 22291		30 DEC 63	J.E.L.
W		CHANGE IN ACCORDANCE WITH CA 196160 PER TDRR 08220		27 MAR 64	J.K.



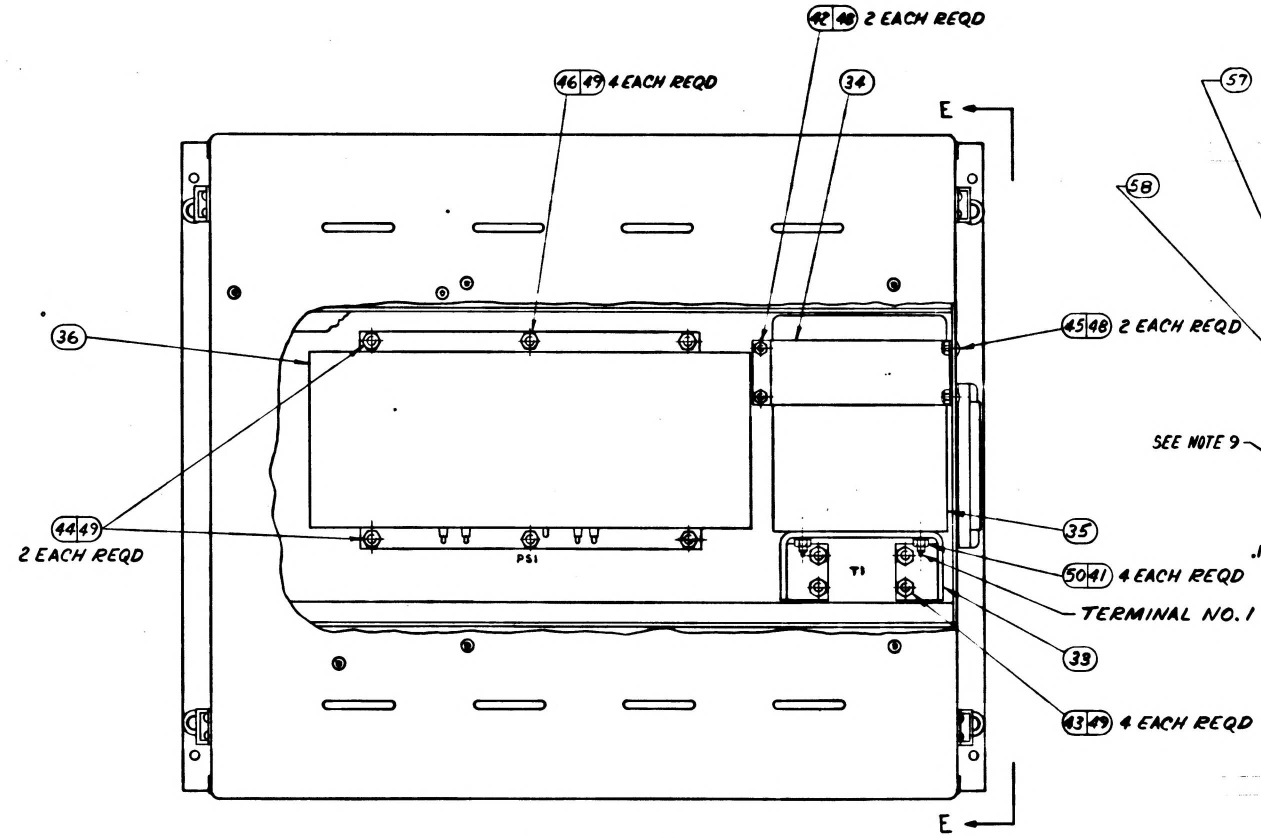
39
40 45 48
7 EACH REQD
56 13
4 EACH REQD
38
37
3 REQD
55
47 25
20 EACH REQD

INSIDE VIEW OF COVER ITEM 2(REF)

FOR INFORMATION ONLY

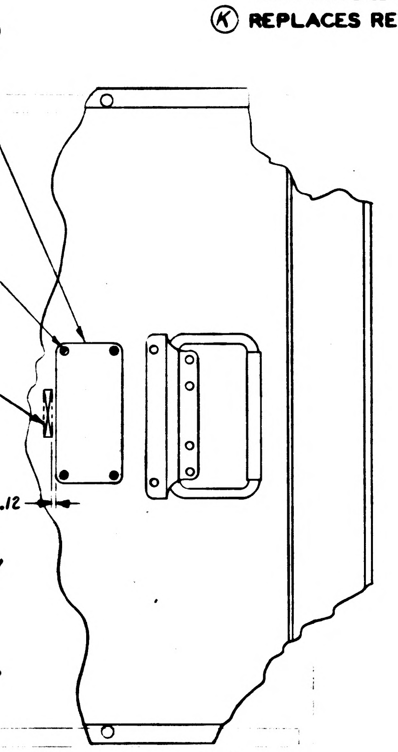
CLASS B RELEASE TDR No. 0518 6/12/63 DATE

Ⓚ REPLACES REV"J" WITH CHANGE



42 48 2 EACH REQD
46 49 4 EACH REQD
34
E
36
45 48 2 EACH REQD
44 49
2 EACH REQD
PS1
T1
35
50 41 4 EACH REQD
TERMINAL NO. 1
33
43 49 4 EACH REQD
E

PARTIAL VIEW D-D



57
58
SEE NOTE 9
.12

PARTIAL VIEW E-E

THIS SHEET ADDED

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 9 SEP 63 DATE
CHECKED WILSON 18 SEP 63
APPROVAL 18 Sep 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

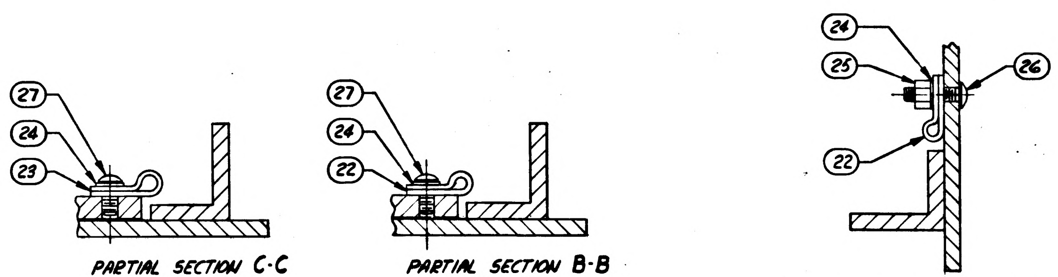
CODE IDENT NO.
SIZE E
1900011
SCALE 1:2
SHEET 2 OF 2

1900011
SH 2

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01519 DATE 6/12/64
Ⓚ REPLACES REV "J" WITH CHANGE

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K		ADDED SHEET-2 REPLACES REV. J MXC 190348 REVISED PER TDR 06215		8 OCT 63 2-1-64	
L		CHANGE IN ACCORDANCE WITH MXC-190602		26 DEC 63	J.E.L.
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
N		CHANGE IN ACCORDANCE WITH MXC-191345		27 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764		30 DEC 63	J.E.L.
R		CHANGE IN ACCORDANCE WITH MXC-192010		3 JAN 64	J.E.L.
S		CHANGE IN ACCORDANCE WITH MXC-192485		6 JAN 64	J.E.L.
T		CHANGE IN ACCORDANCE WITH CM 192960 PER TDRR 06291		7 JAN 64	J.E.L.
U		CHANGE IN ACCORDANCE WITH CM 195054		24 FEB 64	
V		CHANGE IN ACCORDANCE WITH CM 96083		6 MAR 64	
W		CHANGE IN ACCORDANCE WITH CM 196168 PER TDRR 08220		27 MAR 64	J.K.
Y		REVISED PER TDRR 11569		25 FEB 64	

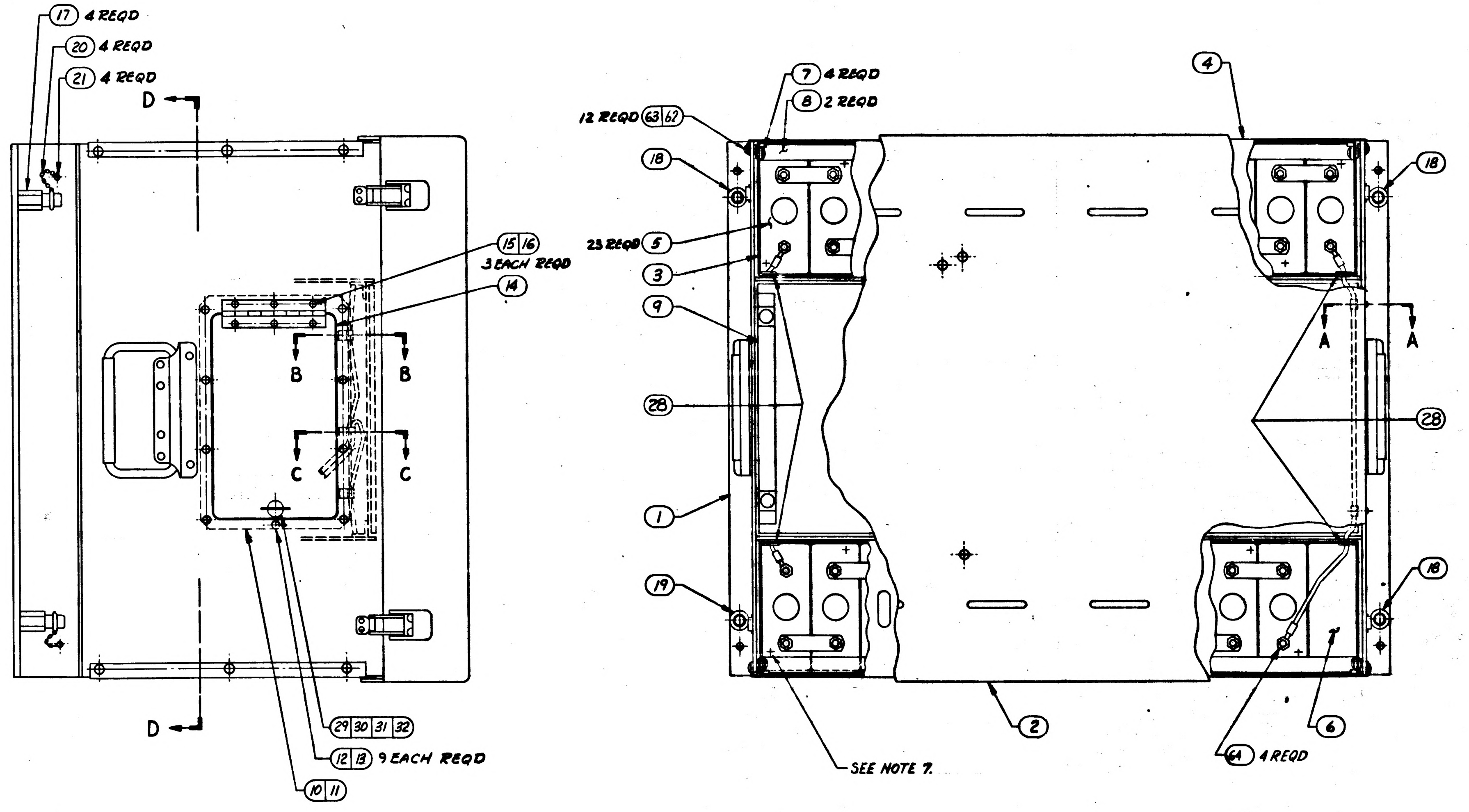
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2.
3.
4. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52.
6. ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE (+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 IN ACCORDANCE WITH ND 1002023, LETTERS AND NUMERALS TO BE .12 HIGH.
9. MARK APPLICABLE REVISION LETTER (REV) PER ND 1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.



PARTIAL SECTION C-C
SCALE 2:1

PARTIAL SECTION B-B
TWO PLACES
SCALE 2:1

PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1



	QTY REQD 011	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	4	65	AN960-C416	1897006-042 WASHER, FLAT
SEE NOTE 4	4	64	1015902-50	TERMINAL LUG
SEE NOTE 4	12	63	1006783-43	SCREW, MACHINE
	12	62	AN 960-C10L	(1897006-017) WASHER - FLAT
SEE NOTE 4 & 5	1	61	1015818-90	CONNECTOR
	1	60	1900955	CABLE, ELEC, INTERCONNECT, W100 (BPP TO PTC)
	1	59	1900954	CABLE, ELEC, INTERCONNECT, W101 (BPP TO IMU)
	4	58	AN535-0-3	(1897109-103) SCREW, DRIVE
	1	57	1901304-208	NAMEPLATE
	4	56	1006873-27	SCREW, MACHINE
	1	55	MS3105-32	DUMMY RECEPTACLE
	X	54	1900559	WIRING DIAGRAM
	1	53	1900903	WIRE LIST BB
	1	52	1900923	WIRING HARNESS B
	X	51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
	4	50	AN335-4	NUT, PLAIN HEX
	10	49	AN363C428	NUT, SELF-LOCKING
	11	48	AN363C1032	NUT, SELF-LOCKING
	16	47	1006783-19	SCREW, MACHINE
	4	46	1006783-57	SCREW, MACHINE
	9	45	1006783-44	SCREW, MACHINE
SEE NOTE 4	2	44	1015826-407	SCREW, MACHINE
SEE NOTE 4	4	43	1015826-411	SCREW, MACHINE
SEE NOTE 4	2	42	1015826-304	SCREW, MACHINE
	4	41	MS35338-82	WASHER, LOCK
SEE NOTE 4	7	40	1016105-004	CLAMP
SEE NOTE 4	1	39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4	1	38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4	3	37	1016073-123	DUMMY RECEPTACLE
	1	36	1900158	INVERTER, STATIC
SEE NOTE 4	1	35	1015953	TRANSFORMER, POWER
	1	34	1900795	BRACKET, TRANSFORMER HOLD DOWN
	1	33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4	1	32	1016062-001	WASHER, WEAR
SEE NOTE 4	1	31	1016060-017	STUD, WING HEAD
SEE NOTE 4	1	30	1016061-001	SPRING, EJECTOR
SEE NOTE 4	1	29	1015857-1	WASHER, RETAINER
	4	28	MS 35489-6	GROMMET, RUBBER
SEE NOTE 4	3	27	1006783-18	SCREW, MACHINE
	2	26	1006783-20	SCREW, MACHINE
SEE NOTE 4	22	25	1016151-004	NUT, SELF-LOCKING
	5	24	AN960-C4L	WASHER, FLAT
SEE NOTE 4	1	23	1015985-201	CABLE CLAMP
SEE NOTE 4	4	22	1015985-203	CABLE CLAMP
	4	21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4	4	20	1016067-003	CHAIN SAFETY
SEE NOTE 4	1	19	1016065-018	PIN, QUICK RELEASE
SEE NOTE 4	3	18	1016065-011	PIN, QUICK RELEASE
	4	17	1900773	RETAINER, PIN
	3	16	AN363C632	NUT, SELF-LOCKING
	3	15	1006783-24	SCREW, MACHINE
	1	14	1900471	DOOR, ACCESS (INSEP) ASSY
	13	13	AN363C832	NUT, SELF-LOCKING
	9	12	1006783-28	SCREW, MACHINE
	1	11	1900818	GASKET, BACKPLATE (RFI)
	1	10	1900472	BACKPLATE (INSEP) ASSY
	1	9	1900473	PANEL ASSY
	2	8	1900822	CLAMP, BATTERY
	4	7	1006783-42	SCREW, MACHINE
	1	6	1015972-002	BATTERY, STORAGE
	23	5	1015972-001	CELL, NICKEL CADMIUM
	2	4	1900464	BATTERY COVER (INSEP) ASSY
	2	3	1900461	BATTERY CASE (INSEP) ASSY
	1	2	1900460	COVER, BATTERY POWER PACK
	1	1	1900456	CASE, BATTERY POWER PACK

QUANTITY REQUIRED — EFFECTIVITY — LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
W	W
V	P
U	P
T	P
S	P
R	P
P	P
N	M
M	M
L	K
K	K

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900011-011	1900030-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

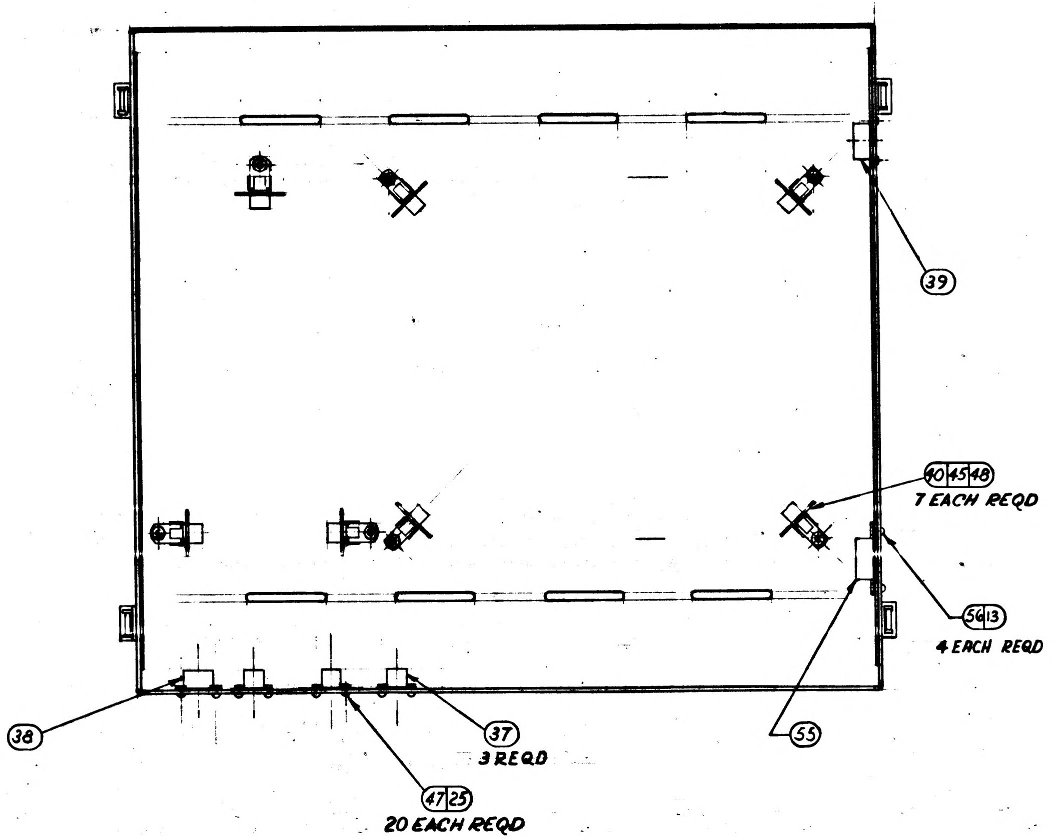
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. Sommer DATE 9 SEP 63
CHECKED Wilson 18 SEP 63
APPROVAL 18 Sep 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

BATTERY POWER PACK
ASSEMBLY

CODE IDENT NO. SIZE E 1900011
SCALE 1:2 SHEET 1 OF 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
K		REPLACES REV J WITH CHANGE PER MXC 90348 REVISED PER TDR 06285		19 DEC 63	
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764 PER TDRR 06291		30 DEC 63	J.E.L.
W		CHANGE IN ACCORDANCE WITH CM 196168 PER TDRR 08220		27 MAR 66	J.K.
Y		REVISED PER TDRR 11569		25 AUG 66	



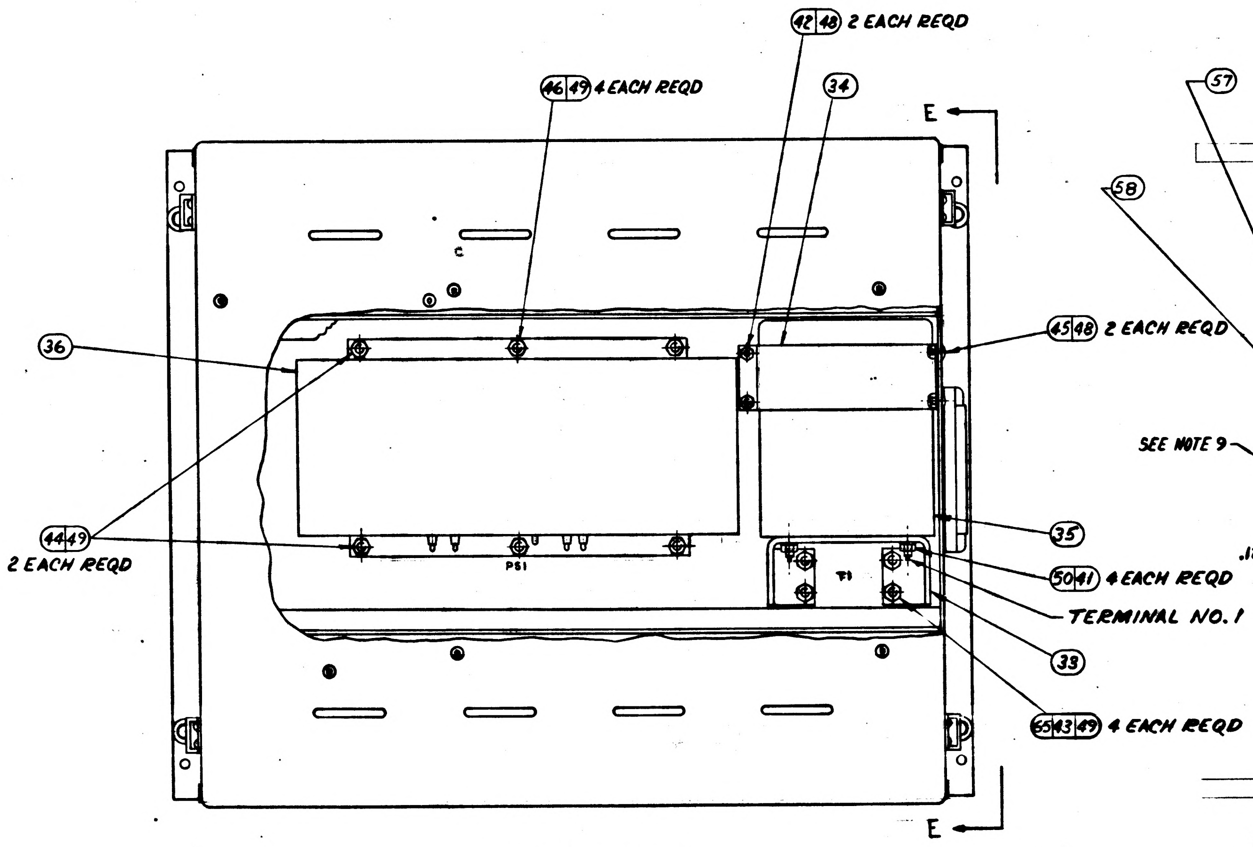
39
40 45 48 7 EACH REQD
56 13 4 EACH REQD
55
37 3 REQD
47 25 20 EACH REQD
38

INSIDE VIEW OF COVER ITEM 2 (REF)

FOR INFORMATION ONLY

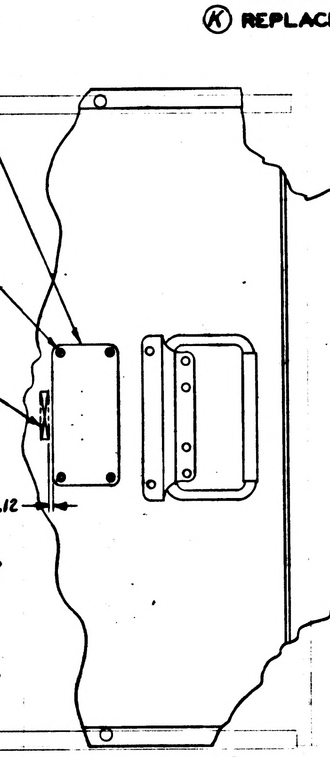
CLASS B RELEASE TDR No. 01518 6/12/63 DATE

Ⓚ REPLACES REV "J" WITH CHANGE



42 48 2 EACH REQD
46 49 4 EACH REQD
34
E
36
45 48 2 EACH REQD
44 49 2 EACH REQD
PS1
T1
35
50 41 4 EACH REQD
TERMINAL NO. 1
33
65 43 49 4 EACH REQD
E

PARTIAL VIEW D-D



57
58
SEE NOTE 9
.12

PARTIAL VIEW E-E

THIS SHEET ADDED

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± ± ±	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	ACSP PN	
	DRAWN 9 SEP 63 DATE CHECKED WILSON 18 SEP 63 APPROVAL 18 Sep 63 APPROVAL 2/11/64	BATTERY POWER PACK ASSEMBLY
DO NOT SCALE THIS DRAWING		
MATERIAL —	NASA APPROVAL G.C. 2/11/64	CODE IDENT NO. / SIZE E / 1900011
CONTRACT NAS9-497	MIT APPROVAL 11 Feb 64	SCALE 1:2 / SHEET 2 OF 2

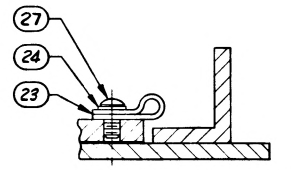
1900011

1800011 S TH2

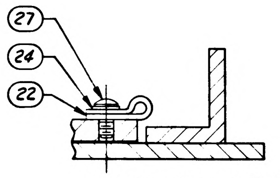
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
K		ADDED SHEET-2 REPLACES REV. "J" WITH CHANGE PER MXC 190348 REVISED PER TDR 06215		8 OCT 63	RW
L		CHANGE IN ACCORDANCE WITH MXC-190602		26 DEC 63	J.E.L.
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
N		CHANGE IN ACCORDANCE WITH MXC-191345		27 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764		30 DEC 63	J.E.L.
R		CHANGE IN ACCORDANCE WITH MXC-192010		3 JAN 64	J.E.L.
S		CHANGE IN ACCORDANCE WITH MXC-192485		6 JAN 64	J.E.L.
T		CHANGE IN ACCORDANCE WITH CM 192465 PER TDRR 06291		7 JAN 64	
U		CHANGE IN ACCORDANCE WITH CM 195054		24 FEB 64	
V		CHANGE IN ACCORDANCE WITH CM 96083		6 MAR 64	
W		CHANGE IN ACCORDANCE WITH CM 196168 PER TDRR 08220		27 MAR 64	J.K.
Y		REVISED PER TDRR 11569		25 AUG 64	WP
Z		REVISED AND UPGRADED TO CLASS A PER TDRR 17587		24 MAR 65	EM

NOTES:

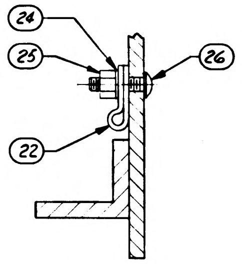
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2.
3.
4. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
5. ITEM 61, NOT SHOWN, MATES WITH ITEM 52 OR ITEM 73.
6. ASSEMBLY SHALL MEET THE REQUIREMENTS OF PS-1900011
7. BATTERY CELLS SHALL BE CONNECTED IN SERIES, POSITIVE(+) TO NEGATIVE, AS SHOWN IN TOP VIEW.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 57 OR ITEM 76 IN ACCORDANCE WITH ND 1002023, LETTERS AND NUMERALS TO BE .12 HIGH.
9. MARK APPLICABLE REVISION LETTER (REV) PER ND 1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.



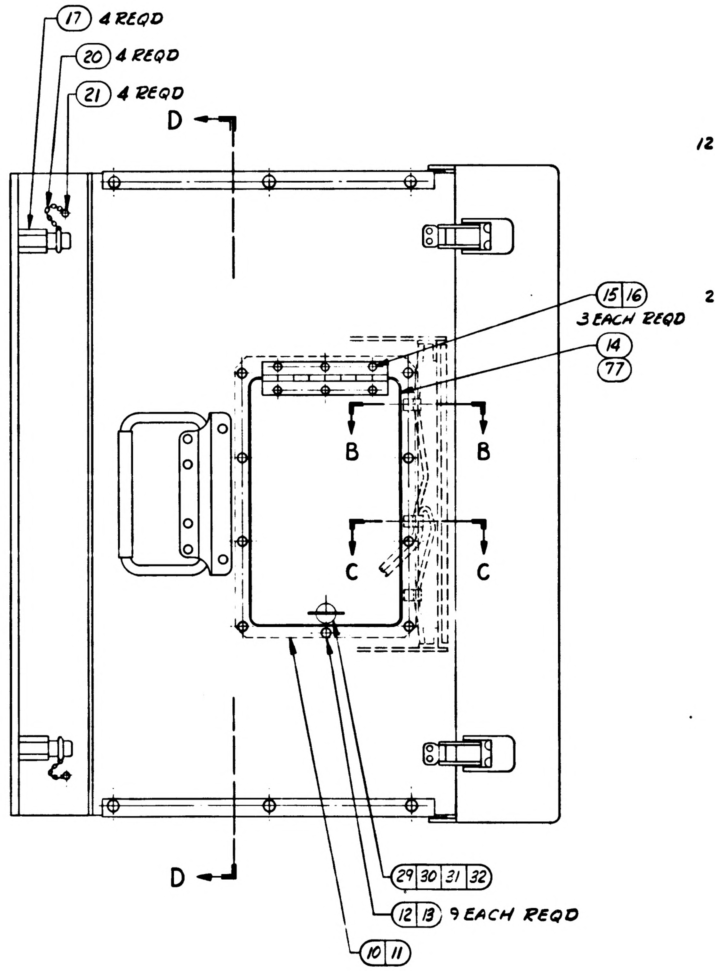
PARTIAL SECTION C-C
SCALE 2:1

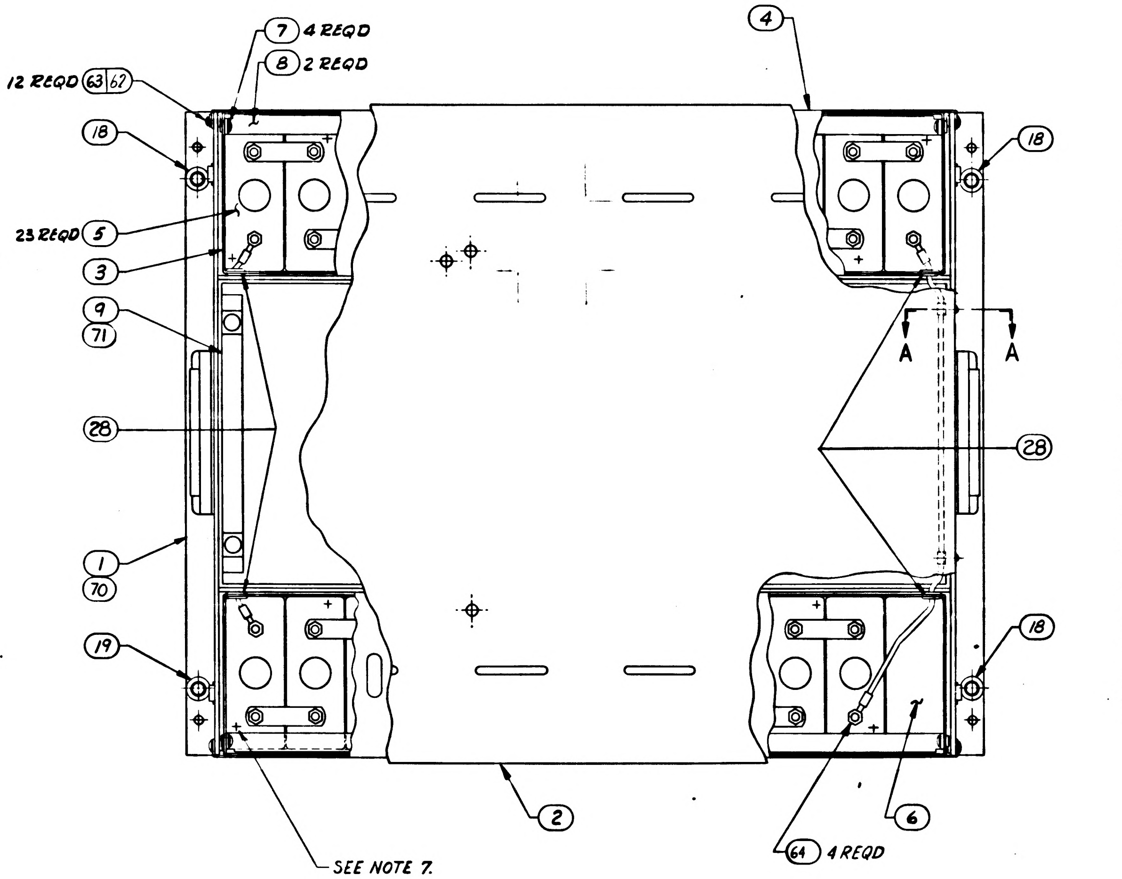


PARTIAL SECTION B-B
TWO PLACES
SCALE 2:1



PARTIAL SECTION A-A
TWO PLACES
SCALE 2:1





						ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			4	4		65	AN960-C416	1897006-042 WASHER, FLAT
SEE NOTE 4			4	4		64	1015902-50	TERMINAL LUG
SEE NOTE 4			12	12		63	1006783-43	SCREW, MACHINE
			12	12		62	AN 960-C10L	(1897006-017) WASHER - FLAT
SEE NOTE 4 & 5			1	1		61	1015818-90	CONNECTOR
			1	1		60	1900955	CABLE, ELEC, INTERCONNECT, W100 (BPP TO PTC)
			1	1		59	1900954	CABLE, ELEC., INTERCONNECT, W101 (BPP TO IMU)
			4	4		58	AN535-0-3	(1897109-103) SCREW, DRIVE
			–	1		57	1901304-208	NAMEPLATE
			4	4		56	1006873-27	SCREW, MACHINE
			1	1		55	MS3105-32	DUMMY RECEPTACLE
			–	X		54	1900559	WIRING DIAGRAM
			–	1		53	1900903	WIRE LIST BB
			–	1		52	1900923	WIRING HARNESS B
			–	X		51	1900650	SCHEMATIC DIAGRAM, ELECTRICAL
			4	4		50	AN335-4	NUT, PLAIN HEX
			10	10		49	AN363C428	NUT, SELF-LOCKING
			11	11		48	AN363C1032	NUT, SELF-LOCKING
			20	20		47	1006783-19	SCREW, MACHINE
			4	4		46	1006783-57	SCREW, MACHINE
			9	9		45	1006783-44	SCREW, MACHINE
SEE NOTE 4			2	2		44	1015826-407	SCREW, MACHINE
SEE NOTE 4			4	4		43	1015826-411	SCREW, MACHINE
SEE NOTE 4			2	2		42	1015826-304	SCREW, MACHINE
			4	4		41	MS35338-82	WASHER, LOCK
SEE NOTE 4			7	7		40	1016105-004	CLAMP
SEE NOTE 4			1	1		39	1016073-183	DUMMY RECEPTACLE
SEE NOTE 4			1	1		38	1016073-143	DUMMY RECEPTACLE
SEE NOTE 4			3	3		37	1016073-123	DUMMY RECEPTACLE
			1	1		36	1900158	INVERTER, STATIC
SEE NOTE 4			1	1		35	1015953	TRANSFORMER, POWER
			1	1		34	1900795	BRACKET, TRANSFORMER HOLD DOWN
			1	1		33	1900479	BRACKET, TRANSFORMER
SEE NOTE 4			1	1		32	1016062-001	WASHER, WEAR
SEE NOTE 4			1	1		31	1016060-017	STUD, WING HEAD
SEE NOTE 4			1	1		30	1016061-001	SPRING, EJECTOR
SEE NOTE 4			1	1		29	1015857-1	WASHER, RETAINER
			4	4		28	MS35489-6	GROMMET, RUBBER
SEE NOTE 4			3	3		27	1006783-18	SCREW, MACHINE
			2	2		26	1006783-20	SCREW, MACHINE
SEE NOTE 4			22	22		25	1016151-004	NUT, SELF-LOCKING
			5	5		24	AN960-C4L	WASHER, FLAT
SEE NOTE 4			1	1		23	1015985-201	CABLE CLAMP
SEE NOTE 4			4	4		22	1015985-203	CABLE CLAMP
			4	4		21	AN535-4-3	SCREW, DRIVE
SEE NOTE 4			4	4		20	1016067-003	CHAIN SAFETY
SEE NOTE 4			1	1		19	1016065-013	PIN, QUICK RELEASE
SEE NOTE 4			3	3		18	1016065-011	PIN, QUICK RELEASE
			4	4		17	1900773	RETAINER, PIN
			3	3		16	AN363C632	NUT, SELF-LOCKING
			3	3		15	1006783-24	SCREW, MACHINE
			–	1		14	1900471	DOOR, ACCESS (INSEP) ASSY
			13	13		13	AN363C832	NUT, SELF-LOCKING
			9	9		12	1006783-28	SCREW, MACHINE
			1	1		11	1900818	GASKET, BACKPLATE (RFI)
			1	1		10	1900472	BACKPLATE (INSEP) ASSY
			–	1		9	1900473-011	PANEL ASSY
			2	2		8	1900822	CLAMP, BATTERY
			4	4		7	1006783-42	SCREW, MACHINE
			1	1		6	1015972-002	DUMMY CELL
			23	23		5	1015972-C01	CELL, NICKEL CADMIUM
			2	2		4	1900464	BATTERY COVER (INSEP) ASSY
			2	2		3	1900461	BATTERY CASE (INSEP) ASSY
			1	1		2	1900460	COVER, BATTERY POWER PACK
			–	1		1	1900456	CASE, BATTERY POWER PACK
			021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1	–		77	1902140	DOOR, ACCESS (INSEP ASSY)
		1	–		76	1901304-236	NAMEPLATE
		X	–		75	1902192	WIRING DIAGRAM
		1	–		74	1902189	WIRE LIST B-B
		1	–		73	1902188	WIRING HARNESS B
		X	–		72	1902138	SCHEMATIC DIAGRAM, ELECTRICAL
		1	–		71	1902249-011	PANEL ASSEMBLY
		1	–		70	1902128	CASE, BATTERY POWER PACK
		1	–		69	RE75G1R00	(1896982-097) RESISTOR MIL-R-18546/1
		1	–		68	RE75GR715	(1896982-083) RESISTOR MIL-R-18546/1
		4	–		67	1016151-004	NUT, SELF LOCKING
		4	–		66	AN505C-4R-10	SCREW, MACHINE
		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS	

SHEET 1	SHEET 2
Z	Z
Y	Y
W	W
V	P
U	P
T	P
S	P
R	P
P	P
N	M
M	M
L	K
K	K

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900011-021		021
1900011-011	1900030-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

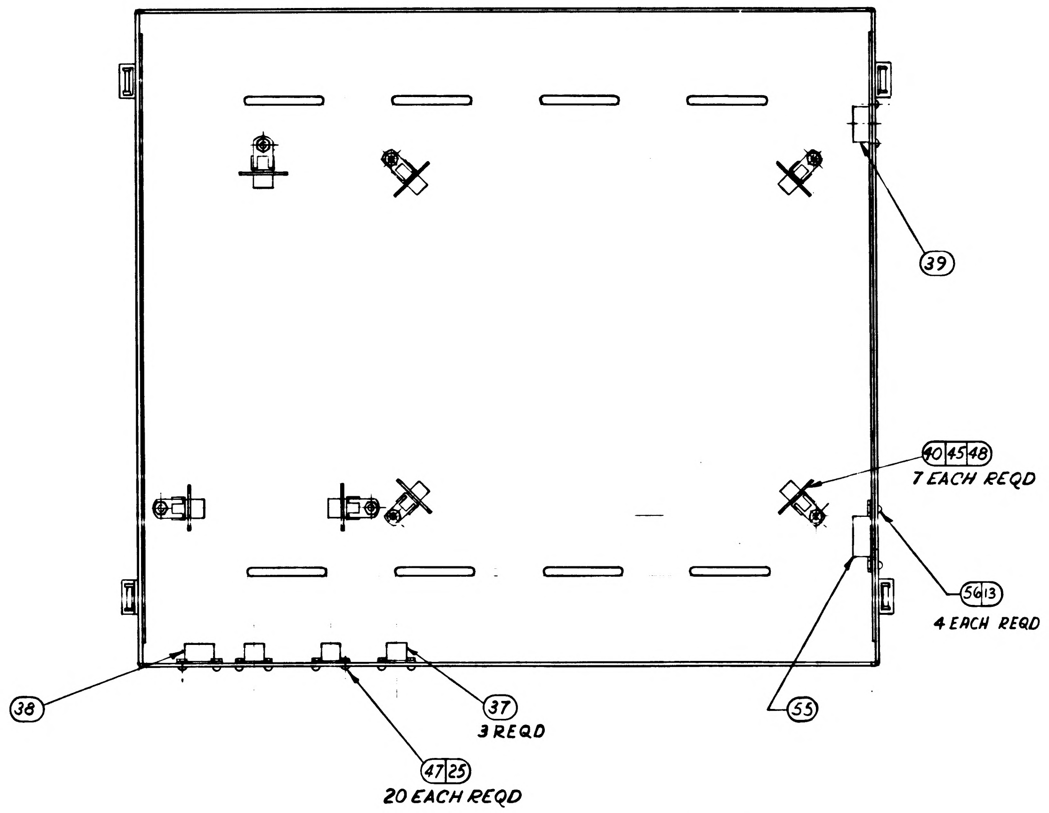
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN SOMMER DATE 9 SEP 63
CHECKED WILSON 18 SEP 63
APPROVAL 18 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

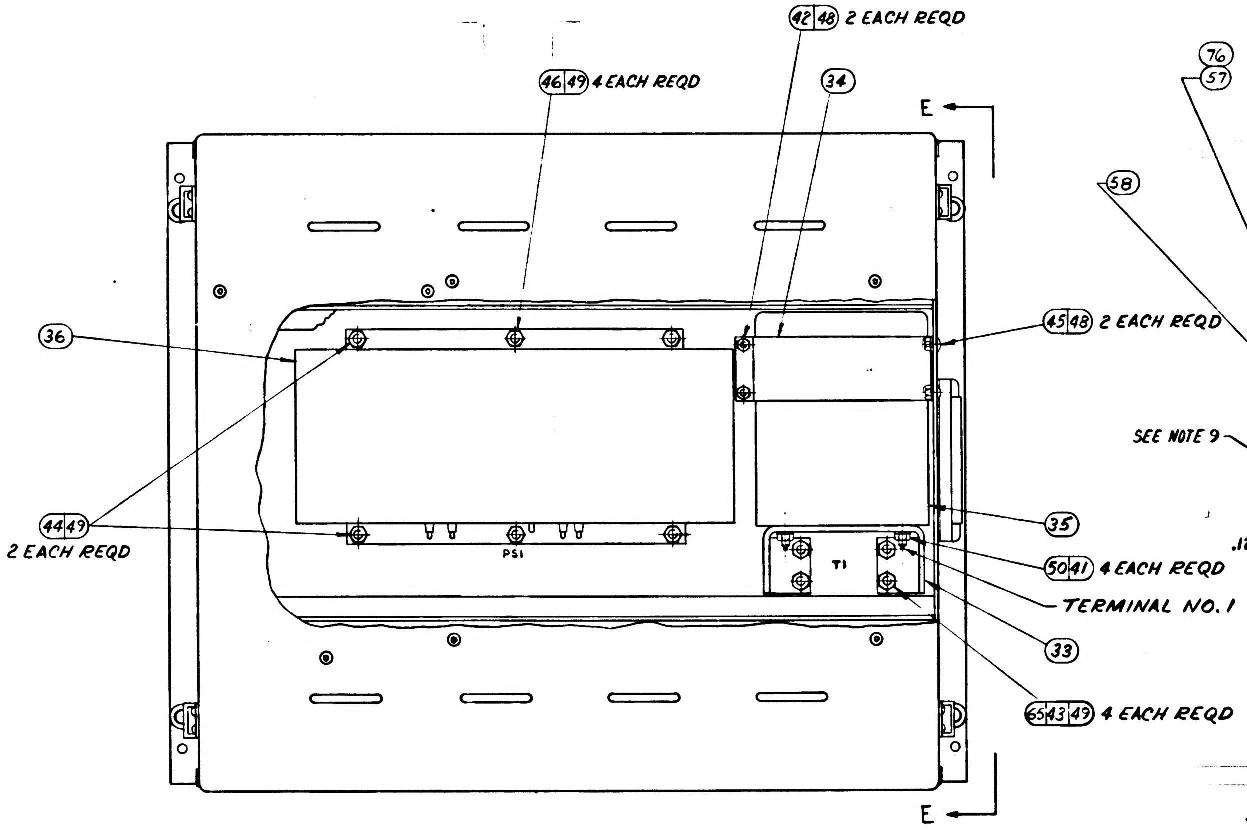
BATTERY POWER PACK
ASSEMBLY

CODE IDENT NO.
SIZE E
1900011
SCALE 1:2
SHEET 1 OF 2

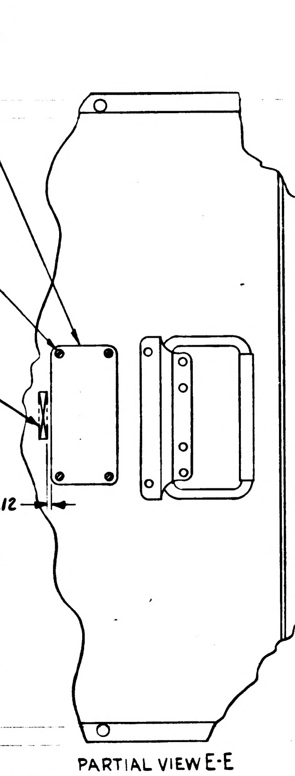
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
K		REPLACES REV."J" WITH CHANGE PER MXC 90348 REVISED PER TDR 06285		63	
M		CHANGE IN ACCORDANCE WITH MXC-191045		26 DEC 63	J.E.L.
P		CHANGE IN ACCORDANCE WITH MXC-191764 PER TDRR 06291		30 DEC 63	J.E.L.
W		CHANGE IN ACCORDANCE WITH CH 196168 PER TDRR 08220		27 MAR 64	J.K.
Y		REVISED PER TDRR 11569		25 AUG 64	
Z		REVISED AND UPGRADED TO CLASS A PER TDRR 17587		24 MAR 65	


39
40 45 48
7 EACH REQD
56 13
4 EACH REQD
38
37
3 REQD
55
47 25
20 EACH REQD

INSIDE. VIEW OF COVER ITEM 2 (REF)

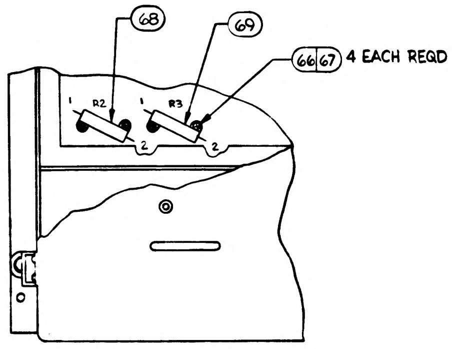

42 48 2 EACH REQD
46 49 4 EACH REQD
34
E
36
45 48 2 EACH REQD
44 49
2 EACH REQD
PS1
T1
35
50 41 4 EACH REQD
TERMINAL NO. 1
33
65 43 49 4 EACH REQD
E

PARTIAL VIEW D-D


76
57
58
SEE NOTE 9
.12

PARTIAL VIEW E-E

THIS SHEET ADDED


68
69
66 67 4 EACH REQD
1
R2
2
1
R3
2

DETAIL SHOWING MOUNTING OF ITEMS (68) AND (69)

-021 CONFIGURATION ONLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES + — + — + — — — — — — —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	ACSP PN	
	DRAWN 9 SEP 63 DATE	BATTERY POWER PACK ASSEMBLY
	CHECKED WILSON 18 SEP 63	
	APPROVAL RH 18 Sep 63	
DO NOT SCALE THIS DRAWING	APPROVAL 2/11/64	
MATERIAL —	NASA APPROVAL	CODE IDENT NO. · SIZE E · 1900011
CONTRACT NAS9-497	MIT APPROVAL	SCALE 1:2 · SHEET 2 OF 2

1900011
SHT 2

APOLLO G&N Specification
PS-1900011

Class Release
TDRR

PROCUREMENT SPECIFICATION
FOR
BATTERY POWER PACK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 06279 **DATE** 2/11/64

Record of Revisions

Revision Letter	TDRR No.	Pages Revised	Approvals		Date
			MIT	NASA	

This specification consists of page i to iii and 1 to 11 inclusive.

PROCUREMENT SPECIFICATION
FOR
BATTERY POWER PACK

The purpose of this document is to establish the manufacturing and test requirements for procurement of the Battery Power Pack for use in the APOLLO Guidance and Navigation Ground Support Equipment.

W Kupfer 11 Feb 64
MIT/IL DATE

NASA/MSC DATE

PROCUREMENT SPECIFICATION
FOR
BATTERY POWER PACK

1. SCOPE

1.1 PURPOSE. This specification establishes the requirements for the procurement of the Battery Power Pack, hereafter called the battery pack.

2. APPLICABLE DOCUMENTS

2.1 EFFECTIVE ISSUES. The following documents of the issue in effect on the date of invitations for bids form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-P-116	Preservation, Methods of
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of

APOLLO G&N

ND-1002018	General Specification for APOLLO Ground Support Equipment
ND-1002023	Procedure for Serialization of Components, Assemblies, etc. for APOLLO Guidance and Navigation Equipment
ND-1015404	General Specification, Configuration, Process and Quality Control Requirements for Suppliers of High Reliability Articles for Use in Spacecraft and Supporting Equipment

DRAWINGS

APOLLO G&N

1900011	Battery Power Pack

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

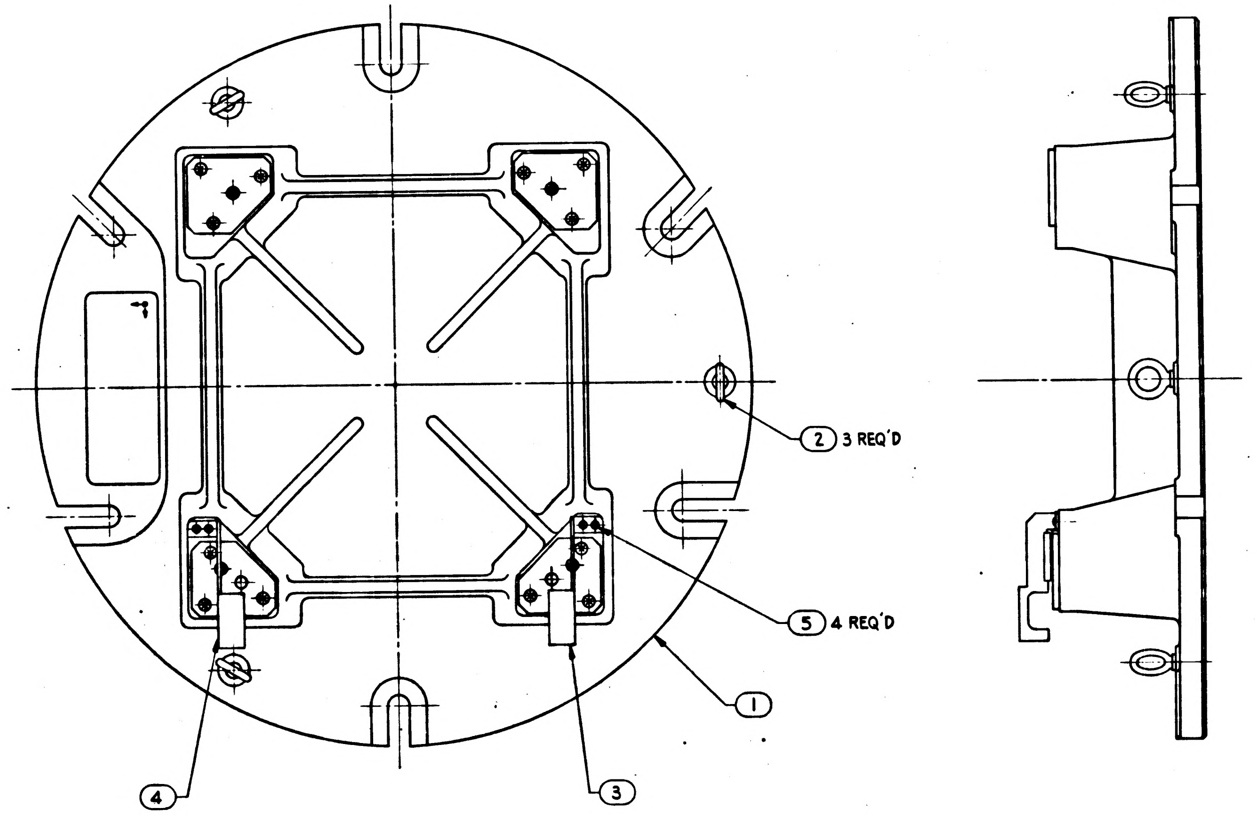
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		REDRAWN AND REVISED-WAS "C" SIZE WORD DRAWING	D.O. 51551	6-MAY-63	A.J.G.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

THE FOLLOWING ITEM IS NOT SHOWN ON THE CONFIGURATION:

ITEM ⑥

IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267).



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ac468 DATE 5 June 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			3		6	1015917-001	T-BOLT - MODIFIED
			4		5	MS-35216-25	SCREW-PAN HEAD
			1		4	1900150	RETAINER-ALIGNMENT TOOL (INSERT
			1		3	1900157	RETAINER-ALIGNMENT TOOL (INSERT
			3		2	1015916-002	BOLT-EYE
			1		1	1900149	FIXTURE IMU MTG, ROTARY TABLE (INSERT

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900005	1900005	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. Fuder DATE 9-MAR-63
CHECKED MALIKOWSKI 25-MAR-63
APPROVAL R.C. Hulttunen 25-Mar-63
APPROVAL A.J. KODEL 25-MAR-63
NASA APPROVAL
L Gedeman 6-4-63
MIT APPROVAL 6 Jun 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

IMU MOUNTING FIXTURE
ASSEMBLY

CODE IDENT NO | SIZE E | 1900012
SCALE 1:2 | SHEET

1900012 A

1900013

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		LIST OF MATERIALS ADDED TDRR 02788	DO 51867	12 AUG 63	WET DH

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 **DATE** 28 Aug 1963

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			4			MS-16555-52	PIN-STRAIGHT
			6			1899979	WASHER-SPRING, BELLEVILLE
			3			1899976	COLLAR-CENTERING
			3			1899967	BALL
			3			1899965	INSERT-OPTICS MTG
			4				SCREW-SHOULDER
			1				↑ ↑ ↑ , LINE
			1				, LINE BASE
			1				, PLANE
			1				, PLANE BASE
			1				INSERT-BALL MT, STATIONARY
			2			AN960B1016	WASHER-FLAT
			6			AN526C1032R8	SCREW-MACH, TRUSS HD.
			2			AN363C524	NUT-HEX
			2			NAS70V328-563	WASHER-FIBRE
			4			AN960C516	WASHER-FLAT
			6			↑ -11	↑ ↑ ↑ ↑
			3			-50	
			6			-67	
			2			-62	
			14			MS16995-66	SCREW-HEX. SOC. HD.
			21			MS35338-83	WASHER-LOCK
			2			MS171658	PIN-SPRING
			3			MS171536	PIN-SPRING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A. J. Fludez DATE 19-MAR-63
MALIKOWSKI 25 MAR 63
CHECKED
APPROVAL AM Bray 25 MAR 63
APPROVAL L. Gediman 8/27/63
NASA APPROVAL [illegible] 8/14/63
MIT APPROVAL L. E. Larson 8/23/63

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SPACECRAFT CENTER
HOUSTON, TEXAS

NAVIGATION BASE FIXTURE
OPTICS

CODE IDENT NO.
SIZE C
1900013
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900013

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		LIST OF MATERIALS ADDED TDRR 02788	DO 51867	12 AUG 63	WET DH
Ⓜ B	-	REPLACED WITH CHANGE BY REVISION C PER MXC-189685 PER TDRR 03880	-	20-SEPT-63 15 OCT 63	M.G. WR

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 **DATE** 28 Aug 1963

Ⓑ REPLACED WITH CHANGE BY REV C PER MXG189685

			4			MS-16555-52	PIN-STRAIGHT
			6			1899979	WASHER-SPRING, BELLEVILLE
			3			1899976	COLLAR-CENTERING
			3			1899967	BALL
			3			1899965	INSERT-OPTICS MTG
			4				SCREW-SHOULDER
			1				↑ ↑ ↑ , LINE
			1				, LINE BASE
			1				, PLANE
			1				, PLANE BASE
			1				INSERT-BALL MT, STATIONARY
			2			AN960B1016	WASHER-FLAT
			6			AN526C1032R8	SCREW-MACH, TRUSS HD.
			2			AN363C524	NUT-HEX
			2			NAS70V328-563	WASHER-FIBRE
			4			AN960C516	WASHER-FLAT
			6			↑ -11	↑ ↑ ↑ ↑
			3			-50	
			6			-67	
			2			-62	
			14			MS16995-66	SCREW-HEX. SOC. HD.
			21			MS35338-83	WASHER-LOCK
			2			MS171658	PIN-SPRING
			3			MS171536	PIN-SPRING
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900030	1900030	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER 19-MAR-63 DATE
MALIKOWSKI 25 MAR 63
CHECKED
APPROVAL AM Bray 25 MAR 63
APPROVAL L Gediman 8/27/63
NASA APPROVAL 8/28/63
MIT APPROVAL 8/23/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

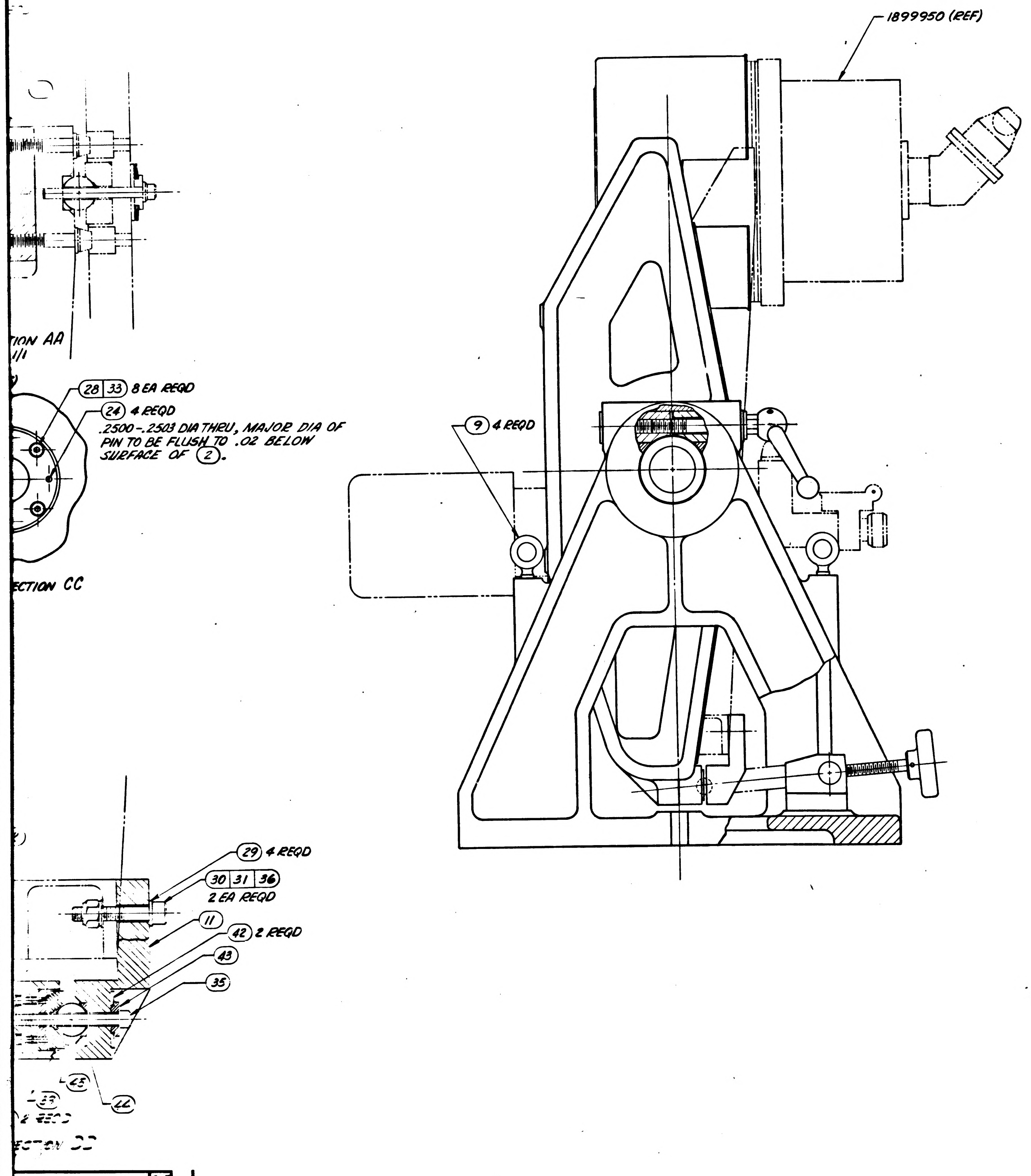
NAVIGATION BASE FIXTURE
OPTICS

CODE IDENT NO.
SIZE C
1900013
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		REPLACES REVISION B WITH CHANGE PER MXC-189685 PER TDRR 03880	—	20-SEPT-63	H.G.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 DATE 28 Aug 63

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			AR		49	MIL-L-6085A	OIL, LUBRICATING (ES-89)
			AR		48	MIL-G-3278A	GREASE, LUBRICATING (ES-134)
					47		
			2		46	1900725-001	HANDLE, SHAFT LOCK
			3		45	1899967	BALL, PRECISION
			3		44	1899965	INSERT, OPTICS MOUNTING
			3		43	1899976	COLLAR, CENTERING
			6		42	1899979	WASHER, SPRING, BELLEVILLE
			1		41	1011566	INSERT, BALL MOUNT, STATIONARY
			1		40	1011739	INSERT ASSY, BALL MOUNT, LINE
			1		39	1011738	INSERT ASSY, BALL MOUNT, PLANE
			2		38	AN960B1016	WASHER, FLAT
			6		37	AN526C1032R8	SCREW, TRUSS HD
			2		36	MS16998-62	
			3		35	MS16998-50	
			6		34	MS16995-67	
			14		33	MS16995-66	
			6		32	MS16995-11	SCREW, CAP, SOCKET HD
			2		31	AN363C524	NUT, HEX
			2		30	NAS 70V328-563	WASHER, FIBRE
			4		29	AN 960 C 516	WASHER, FLAT
			21		28	MS 35338-83	WASHER, LOCK
			2		27	AN960C10	WASHER, FLAT
			3		26	MS 171537	PIN, SPRING
			2		25	MS16995-37	SCREW, CAP, SOCKET HD
			12		24	1016093-001	PIN, STEP
			1		23		SPRING, MP
			1		22		KNOB
			1		21	1900590	GUARD, BELLOWS, INSEP ASSY
			1		20	1900589	SCREW, DIFFERENTIAL
			1		19	1900588	SEAT, SPRING
			1		18	1900587	PIVOT, ANCHOR
			1		17	1900586	PIVOT, MOVING
			1		16	1900585	BLOCK, MOVING
			1		15	1900584	BLOCK, ANCHOR
			2		14	1900583	SPACER, BALL MOUNT
			2		13	1900582	PAD, UPPER
			1		12	1900581	PAD, LOWER
			1		11	1900580	MOUNT, BALL, LOWER
			2		10	1900579	WASHER, THRUST
			4		9	1015916-002	BOLT, EYE, WELDLESS
			1		8	1900577-002	STUD, SHAFT LOCK
			1		7	1900577-001	STUD, SHAFT LOCK
			2		6	1900576	BUSHING, CLAMP
			1		5	1900575-002	BUSHING, CLAMP, [illegible]
			1		4	1900575-001	BUSHING, CLAMP, RH THD
			2		3	1900574	SLEEVE, TRUNNION
			1		2	1900573	CRADLE, FIXTURE, INSEP ASSY
			1		1	1900572	YOKE, FIXTURE
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

Ⓒ1 REPLACES REV B WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — —
DECIMALS + — — —
ANGLES + — — —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-479

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Grahman DATE 19 MAR 63
CHECKED WILSON 3-5-63
APPROVAL
APPROVAL G. Gahman
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FIXTURE,
OPTICS NAVIGATION BASE,
ASSEMBLY

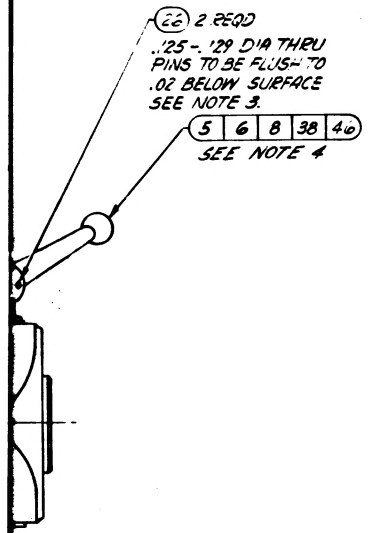
CODE IDENT NO.
SIZE J3
1900013
SCALE 1/2
SHEET 1 OF 1

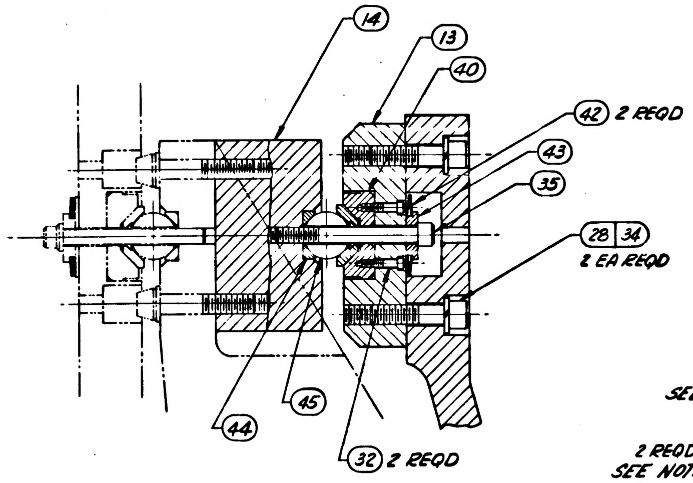
1900013

900013 S-

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1z4


(26) 2 REQD
.125-.129 DIA THRU
PINS TO BE FLUSH TO
.02 BELOW SURFACE
SEE NOTE 3.
5 6 8 38 40
SEE NOTE 4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42 2 REQD
43
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28 34
2 EA REQD
44
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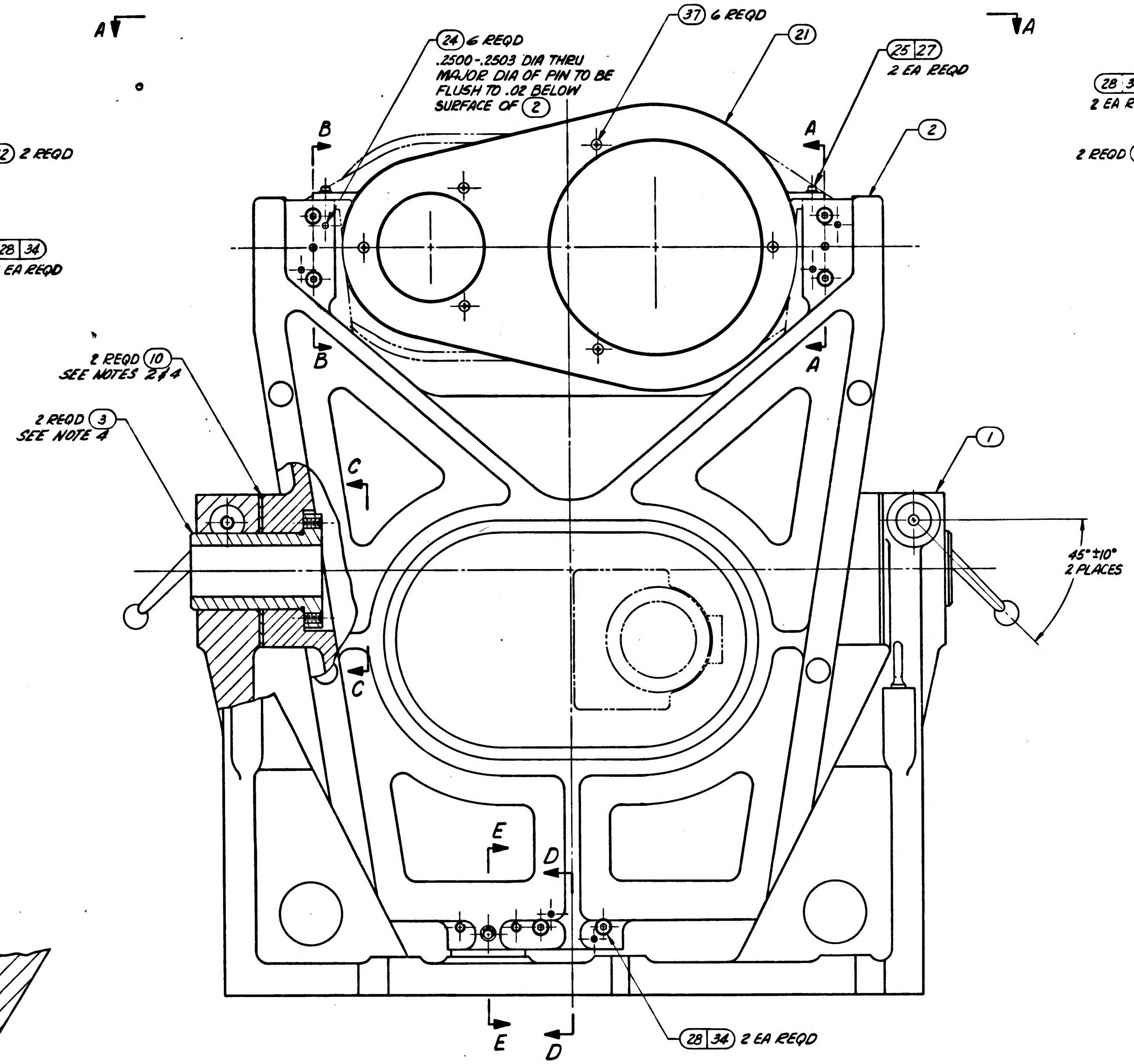
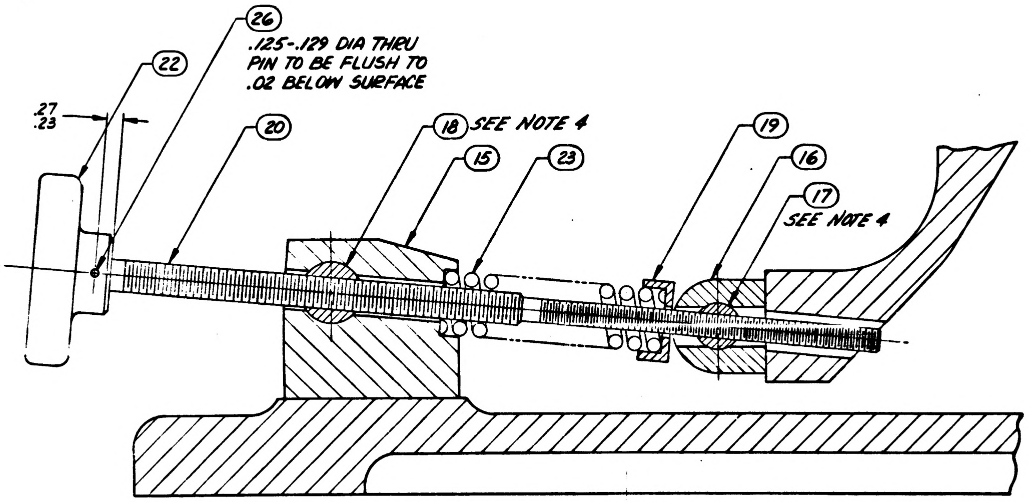
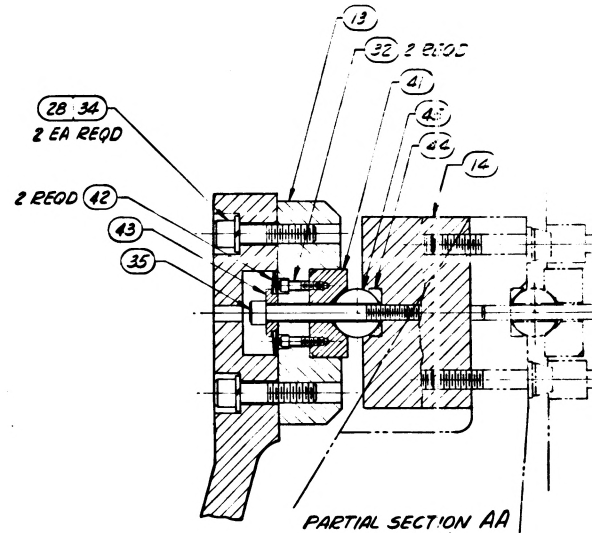
32 2 REQD

PARTIAL SECTION BB
SCALE 1/1

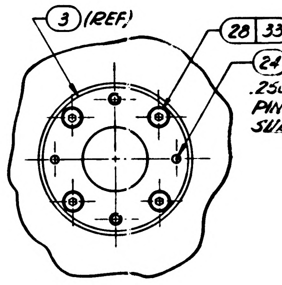

A
A
37 6 REQD
21
24 6 REQD
.2500-.2503 DIA THRU
MAJOR DIA OF PIN TO BE
FLUSH TO .02 BELOW
SURFACE OF 2
25 27
2 EA REQD
2
B
B
A
A
2 REQD 10
SEE NOTES 2 & 4
2 REQD 3
SEE NOTE 4
1
45°±10°
2 PLACES
C
C
E
D
E
D
28 34 2 EA REQD


26
.125-.129 DIA THRU
PIN TO BE FLUSH TO
.02 BELOW SURFACE
22
.27
.23
20
18 SEE NOTE 4
15
23
19
16
17
SEE NOTE 4

PARTIAL SECTION EE
SCALE 1/1


13
32 2 REQD
41
28 34
2 EA REQD
2 REQD 42
43
35
14

PARTIAL SECTION AA
SCALE 1/1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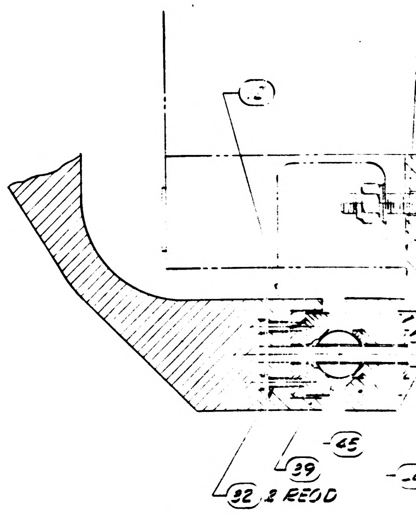
28 33
24

PARTIAL SECTION CC


45
39
32 2 REQD

PARTIAL SECTION DD
SCALE 1/1

1900013 SHT 1

1900013

INCHES
PHOTOGRAPHIC SCALE ONLY

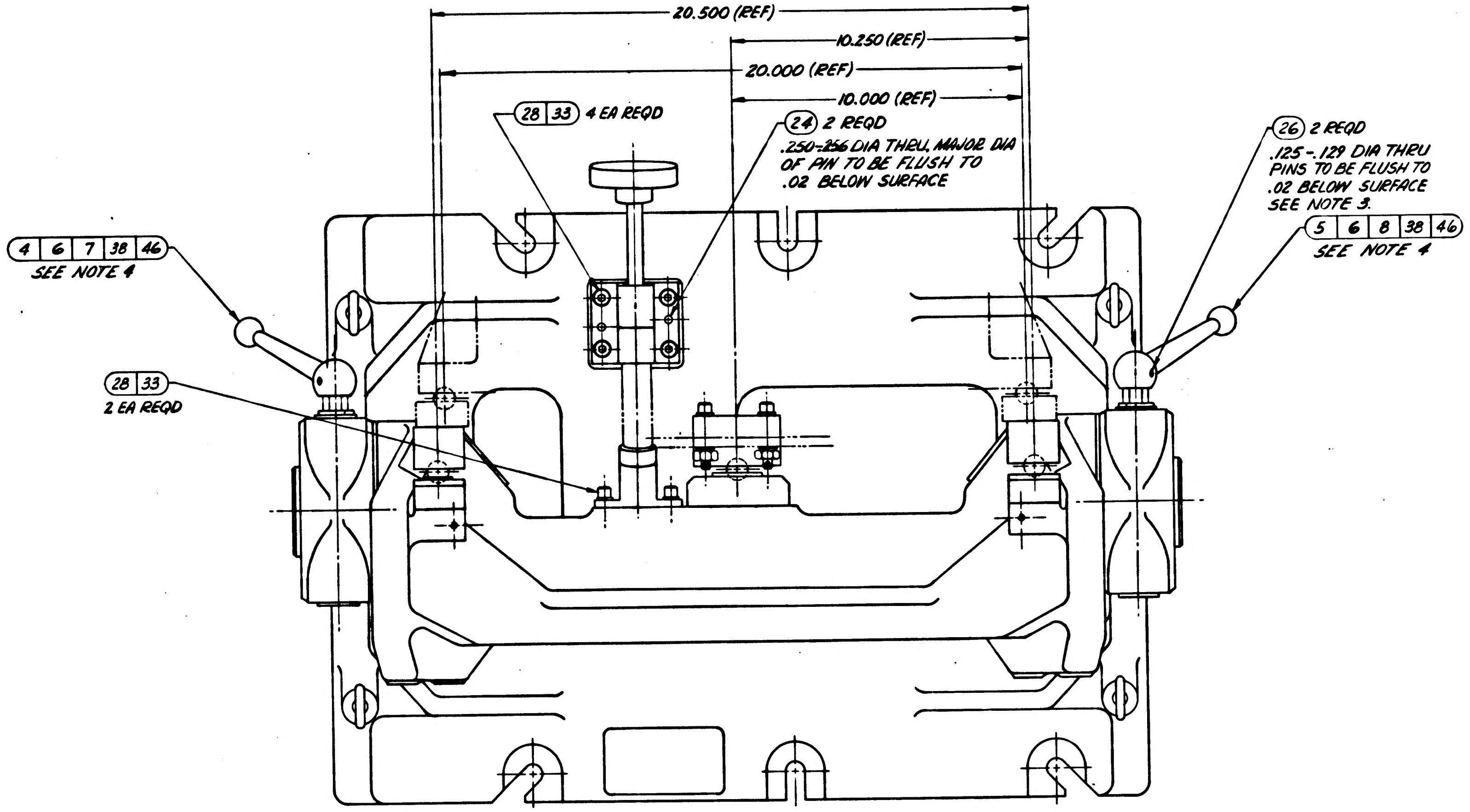
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

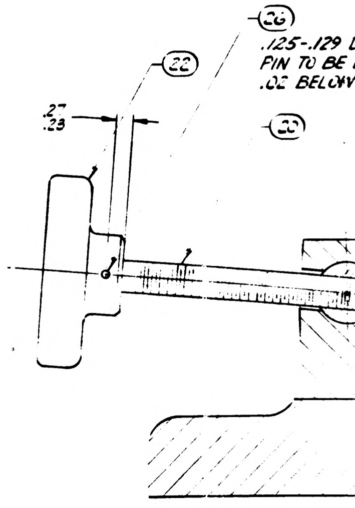
2. MACHINE ⑩ TO ALLOW .003 MAX END PLAY; SURFACE ROUGHNESS NOT TO EXCEED $\sqrt[32]{}$ AND SURFACES TO BE PARALLEL WITHIN .0005.

3. PIN ㊻ TO ⑦ AND ㊼ TO ⑧ AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.

4. LUBRICATION:
   - A. APPLY THIN COAT OF ㊽ TO ALL SCREW THREADS AND ⑰ & ⑱.
   - B. APPLY THIN FILM OF ㊾ TO BEARING SURFACES OF ③, ④, ⑤, ⑥ AND ⑩.

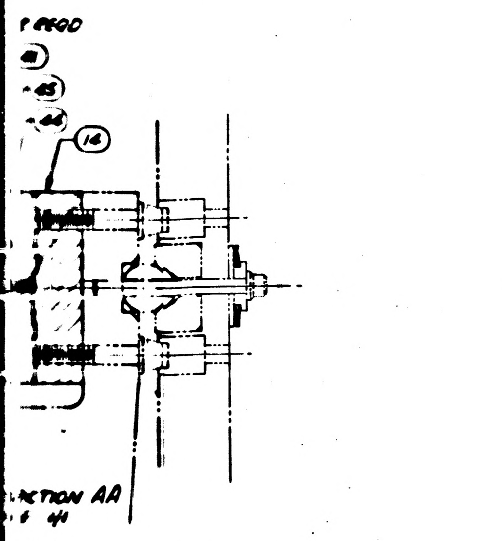

20.500 (REF)
10.250 (REF)
20.000 (REF)
10.000 (REF)
28 | 33 4 EA REQD
㉔ 2 REQD
.250-.256 DIA THRU, MAJOR DIA OF PIN TO BE FLUSH TO .02 BELOW SURFACE
㉖ 2 REQD
.125-.129 DIA THRU PINS TO BE FLUSH TO .02 BELOW SURFACE SEE NOTE 3.
5 | 6 | 8 | 38 | 46
SEE NOTE 4
4 | 6 | 7 | 38 | 46
SEE NOTE 4
28 | 33
2 EA REQD

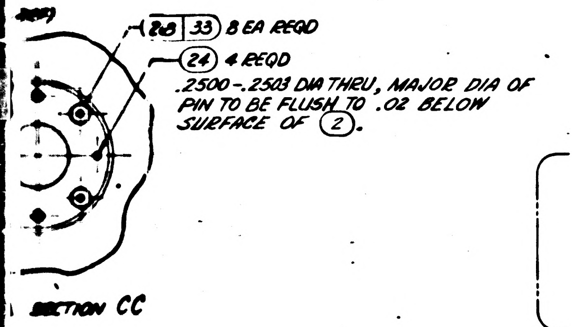
VIEW AA
㉑ NOT SHOWN


㉖
.125-.129
PIN TO BE
.02 BELOW
㉒
.27
.23

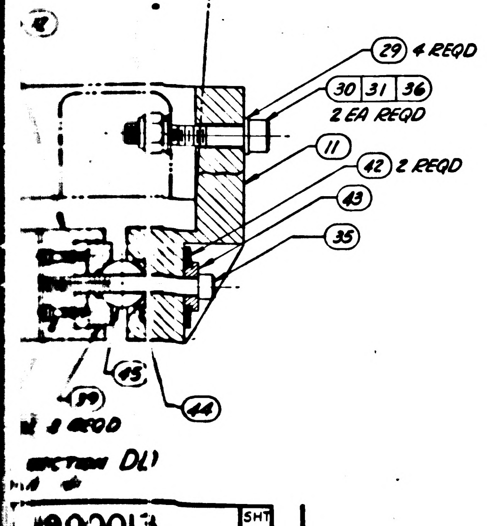
1900013

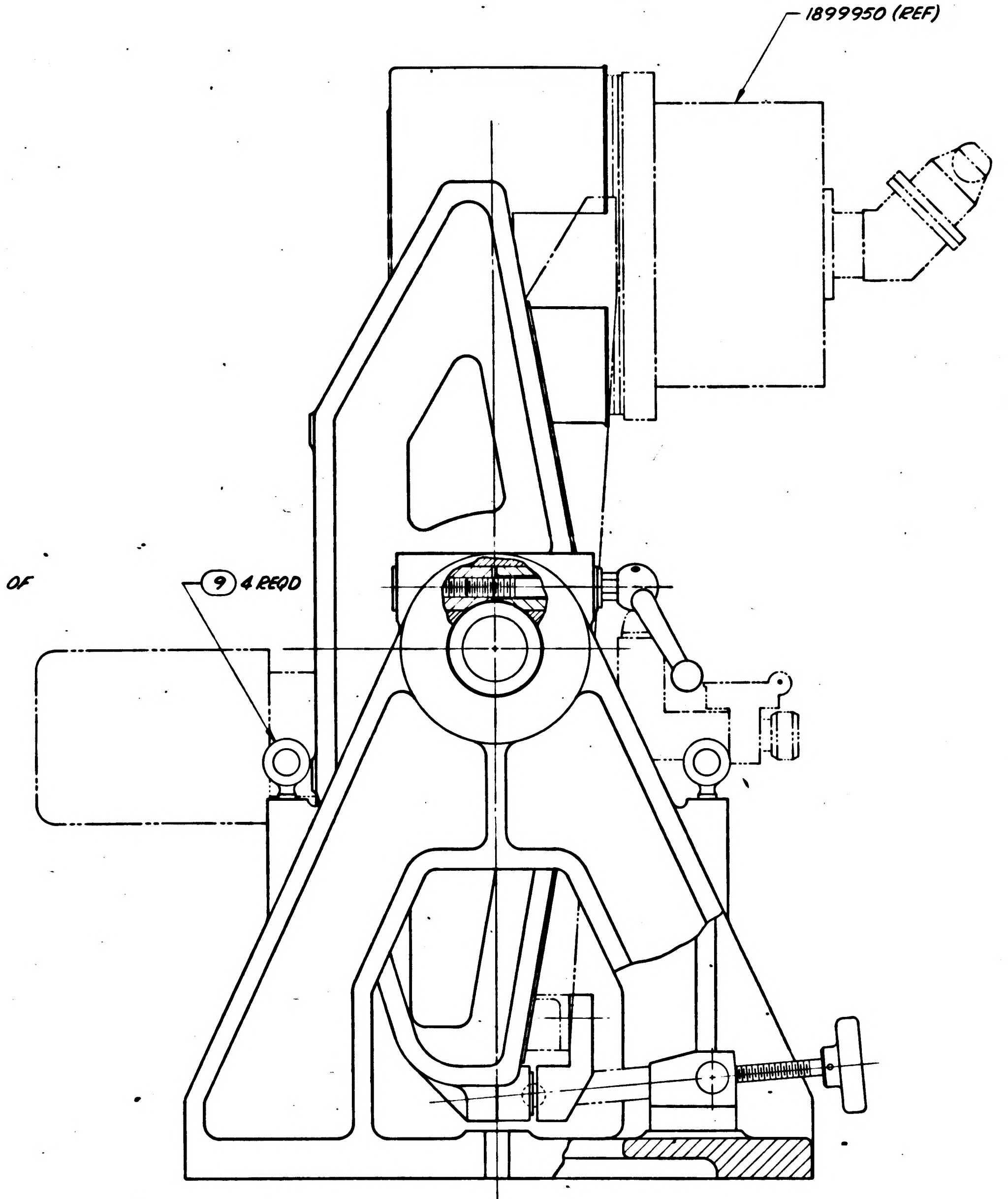
S	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		REPLACES REVISION B WITH CHANGE PER MXC-189685 PER TDRR 03880	—	20-SEPT-63	M.G.
D		CHANGE IN ACCORDANCE WITH CM 194673 08151		4 FEB 64	
E		CHANGE IN ACCORDANCE WITH CM 195279 08152		1 MAR 64	





28 | 33 8 EA REQD
24 4 REQD
.2500-.2503 DIA THRU, MAJOR DIA OF PIN TO BE FLUSH TO .02 BELOW SURFACE OF 2.
SECTION CC





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 DATE 21 aug 63

SEE NOTE 5

QUANTITY REQUIRED							
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			8		52	1015917-001	T-BOLTS
			4		51	AN-535-0-4	SCREW-DRIVE
			1		50	1901304-210	NAMEPLATE
			AR		49	MIL-L-6085A	OIL, LUBRICATING (ES-89)
			AR		48	MIL-G-3278A	GREASE, LUBRICATING (ES-134)
			1		47	MS 171536	PIN-SPRING
			2		46	1900725-001	HANDLE, SHAFT LOCK
			3		45	1900963	BALL, PRECISION
			3		44	1900972	INSERT, OPTICS MOUNTING
			3		43	1900962	COLLAR, CENTERING
			6		42	1899979	WASHER, SPRING, BELLEVILLE
			1		41	1900968	INSERT, BALL MOUNT, STATIONARY
			1		40	1900970-011	INSERT ASSY, BALL MOUNT, LINE
			1		39	1900969-011	INSERT ASSY, BALL MOUNT, PLANE
			2		38	AN960C816	(1897006-082) WASHER-FLAT
			6		37	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
			2		36	MS16998-62	
			3		35	MS16998-50	
			6		34	MS16995-67	
			14		33	MS16995-66	
			6		32	MS16995-11	SCREW, CAP, SOCKET HD
			2		31	AN363C524	(1896990-051) NUT-HEX
			2		30	NAS 70V328-563	WASHER, FIBRE
			4		29	AN960C516	(1897006-052) WASHER-FLAT
			21		28	MS 35338-83	WASHER, LOCK
			2		27	AN960C10	(1897006-017) WASHER-FLAT
			2		26	MS 171537	PIN, SPRING
			2		25	MS16995-37	SCREW, CAP, SOCKET HD
			12		24	1016093-001	PIN, STEP
			1		23	1901606-001	SPRING, MP
			1		22	1900632	KNOB
			1		21	1900590	GUARD, BELLOWS, INSEP ASSY
			1		20	1900589	SCREW, DIFFERENTIAL
			1		19	1900588	SEAT, SPRING
			1		18	1900587	PIVOT, ANCHOR
			1		17	1900586	PIVOT, MOVING
			1		16	1900585	BLOCK, MOVING
			1		15	1900584	BLOCK, ANCHOR
			2		14	1900583	SPACER, BALL MOUNT
			2		13	1900582	PAD, UPPER
			1		12	1900581	PAD, LOWER
			1		11	1900580	MOUNT, BALL, LOWER
			2		10	1900579	WASHER, THRUST
			4		9	1015916-002	BOLT, EYE, WELDLESS
			1		8	1900577-002	STUD, SHAFT LOCK
			1		7	1900577-001	STUD, SHAFT LOCK
			2		6	1900576	BUSHING, CLAMP
			1		5	1900575-002	BUSHING, CLAMP, LH THD
			1		4	1900575-001	BUSHING, CLAMP, RH THD
			2		3	1900574	SLEEVE, TRUNNION
			1		2	1900573	CRADLE, FIXTURE, INSEP ASSY
			1		1	1900572	YOKE, FIXTURE

LIST OF PARTS AND MATERIALS

Ⓒ1 REPLACES REV B WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-479

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Grabman DATE 19 MAR 63
CHECKED WILSON 3 SEP 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

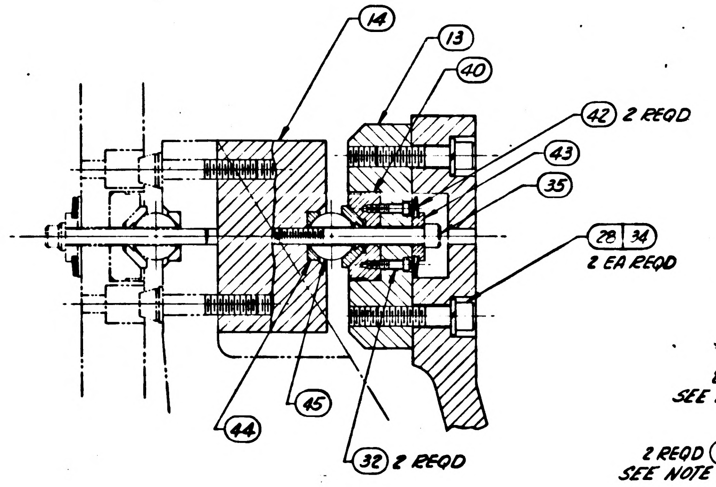
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FIXTURE,
OPTICS NAVIGATION BASE,
ASSEMBLY

CODE IDENT NO. SIZE J3 1900013
SCALE 1/2 SHEET 1 OF 1

1900013 SHT 1

371900013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13
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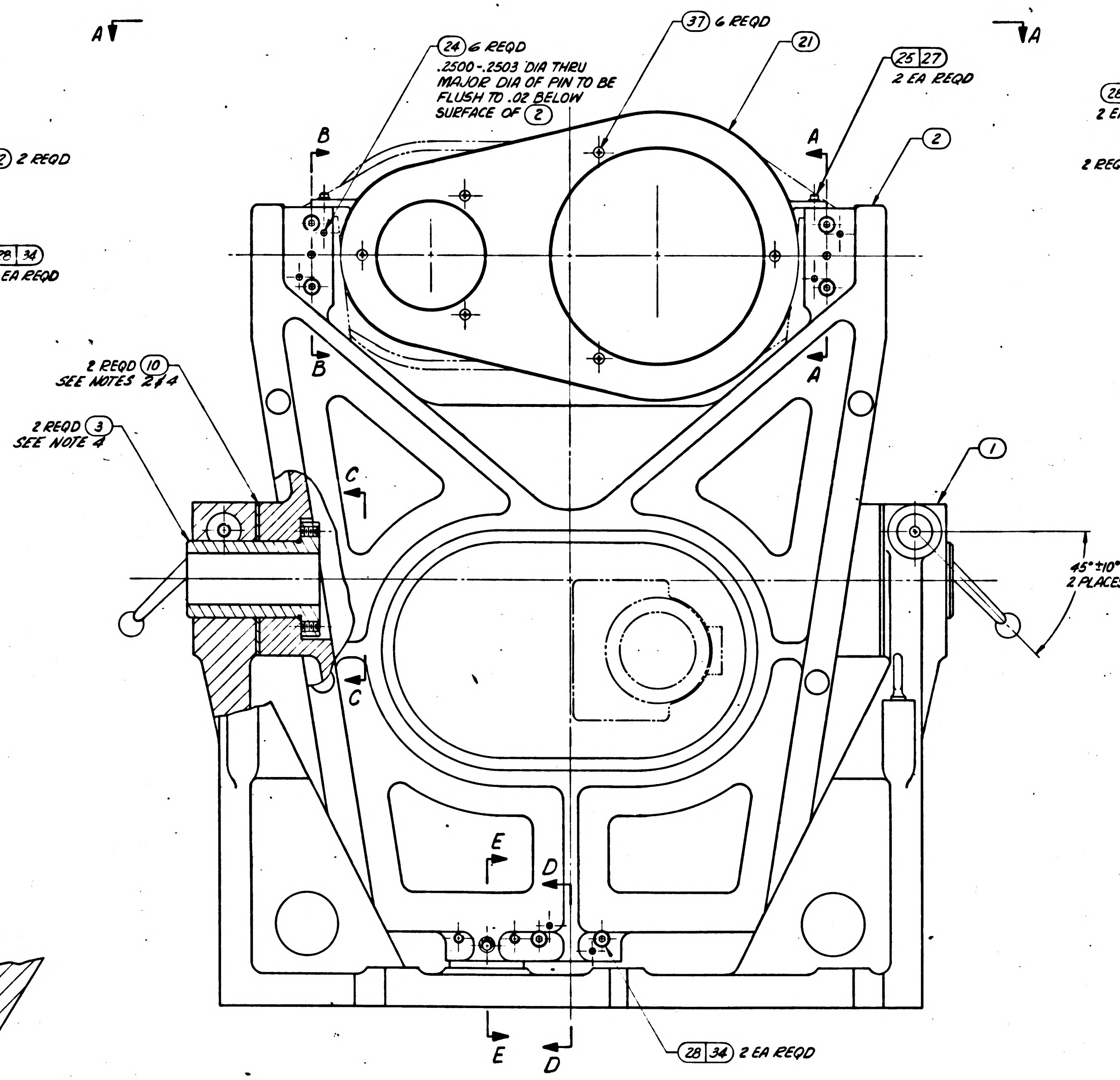
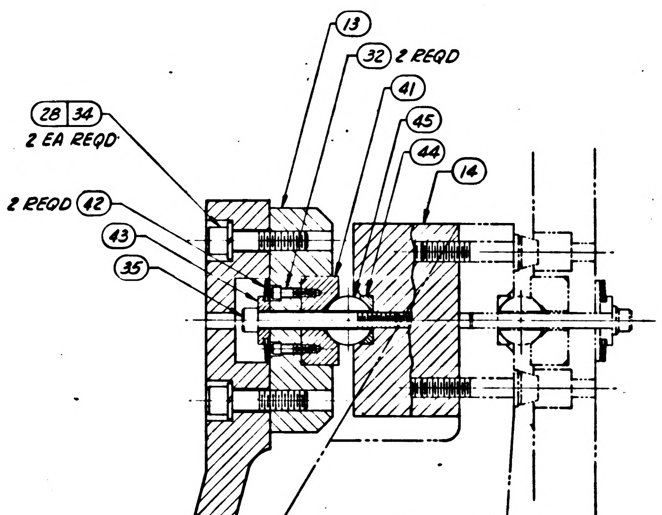
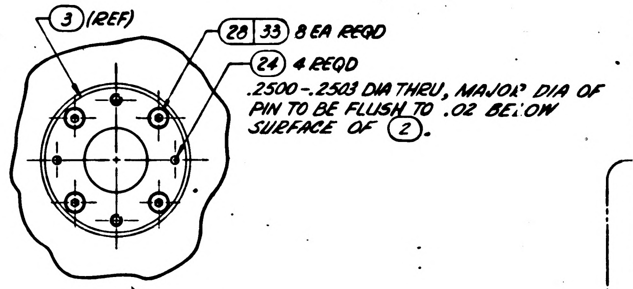
42 2 REQD
43
35
28 34 2 EA REQD
44
45
32 2 REQD

PARTIAL SECTION BB
SCALE 1/1

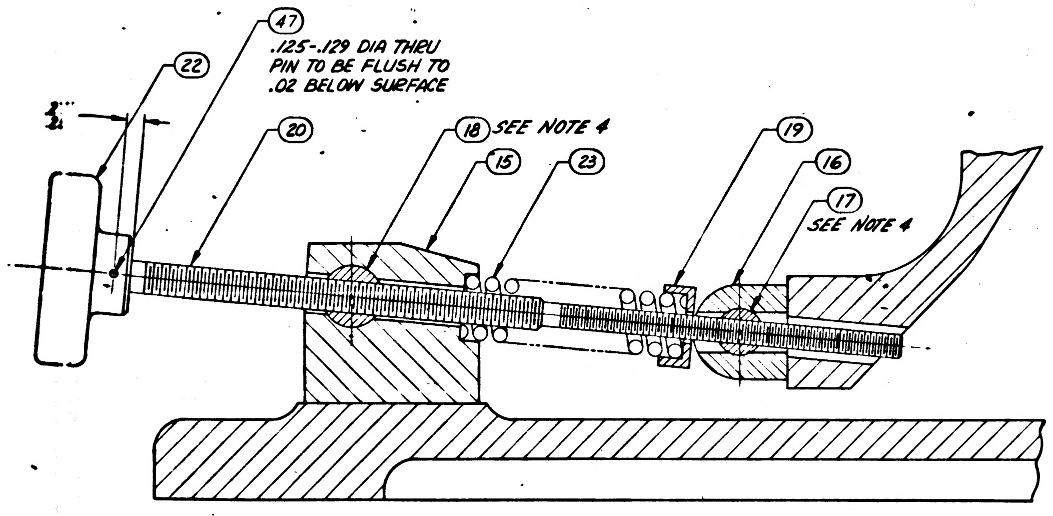

A
A
24 6 REQD
.2500-.2503 DIA THRU
MAJOR DIA OF PIN TO BE
FLUSH TO .02 BELOW
SURFACE OF 2
37 6 REQD
21
25 27
2 EA REQD
2
B
B
A
A
2 REQD 10
SEE NOTES 2 & 4
2 REQD 3
SEE NOTE 4
C
C
1
45° ±10°
2 PLACES
E
E
D
D
28 34 2 EA REQD


13
32 2 REQD
41
45
44
14
28 34
2 EA REQD
2 REQD 42
43
35

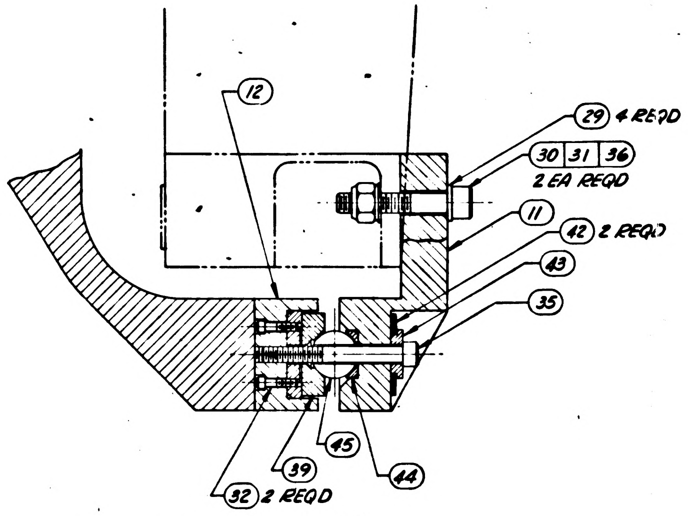
PARTIAL SECTION AA
SCALE 1/1


3 (REF)
28 33 8 EA REQD
24 4 REQD
.2500-.2503 DIA THRU, MAJOR DIA OF
PIN TO BE FLUSH TO .02 BELOW
SURFACE OF 2.

PARTIAL SECTION CC


22
47
.125-.129 DIA THRU
PIN TO BE FLUSH TO
.02 BELOW SURFACE
20
18 SEE NOTE 4
15
23
19
16
17
SEE NOTE 4

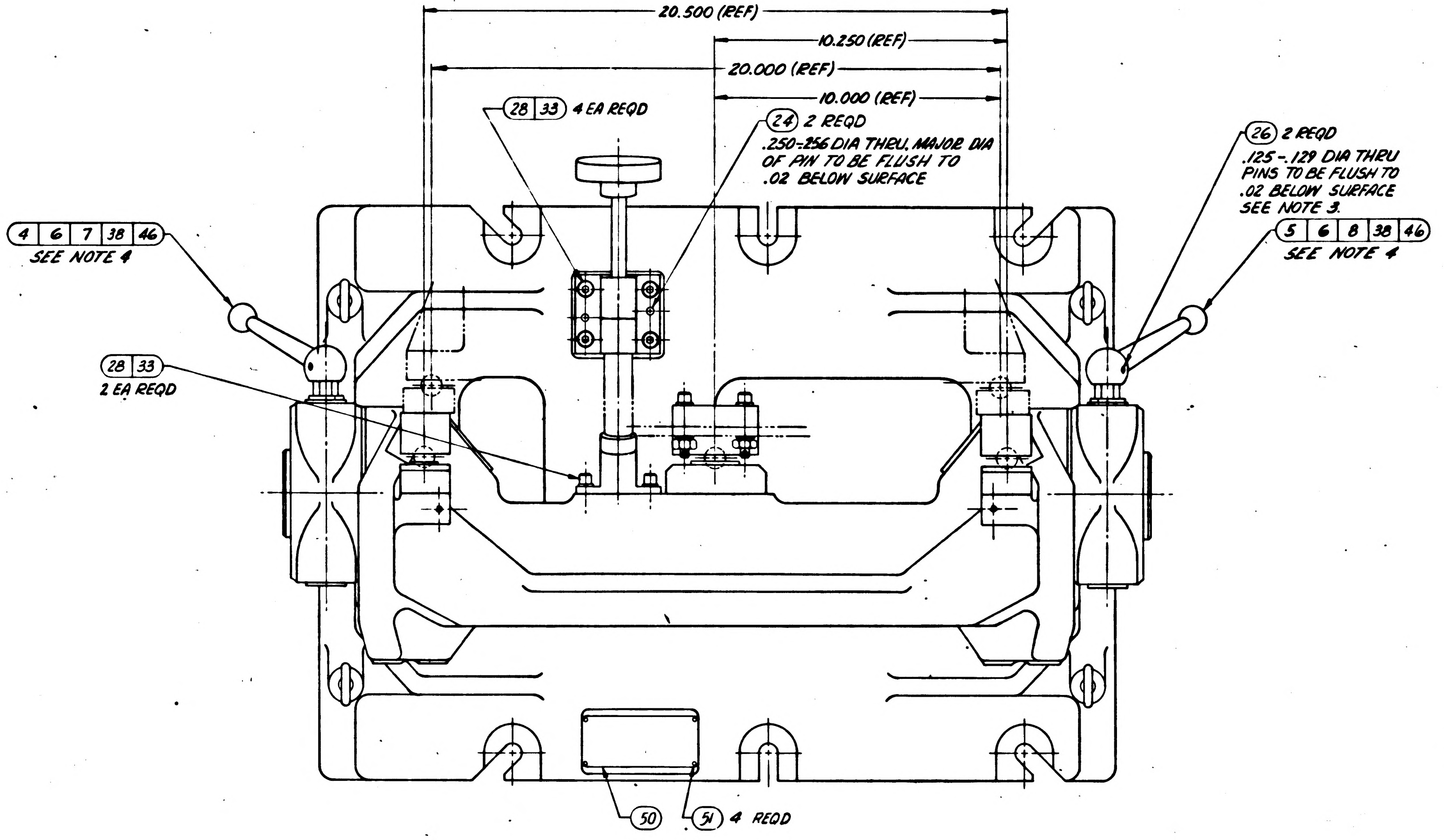
PARTIAL SECTION EE
SCALE 1/1


12
29 4 REQD
30 31 36
2 EA REQD
11
42 2 REQD
43
35
45
39
44
32 2 REQD

PARTIAL SECTION DD
SCALE 1/1

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MACHINE ⑩ TO ALLOW .003 MAX END PLAY; SURFACE ROUGHNESS NOT TO EXCEED $\sqrt{}^{32}$ AND SURFACES TO BE PARALLEL WITHIN .0005.
3. PIN ㊻ TO ⑦ AND ㊼ TO ⑧ AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
4. LUBRICATION:
   - A. APPLY THIN COAT OF ㊽ TO ALL SCREW THREADS AND ⑰ & ⑱.
   - B. APPLY THIN FILM OF ㊾ TO BEARING SURFACES OF ③, ④, ⑤, ⑥ AND ⑩.
5. THE CONFIGURATION OF ITEM (52) IS NOT SHOWN.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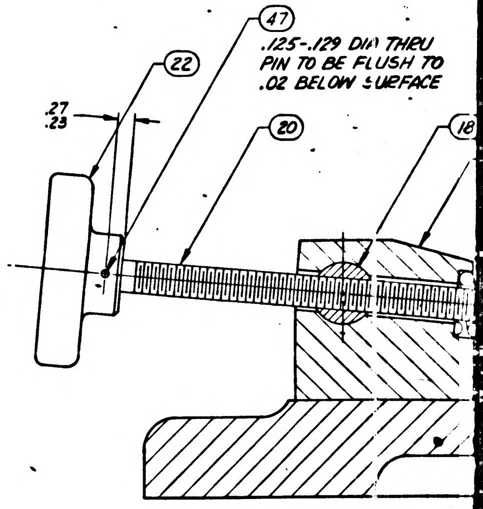
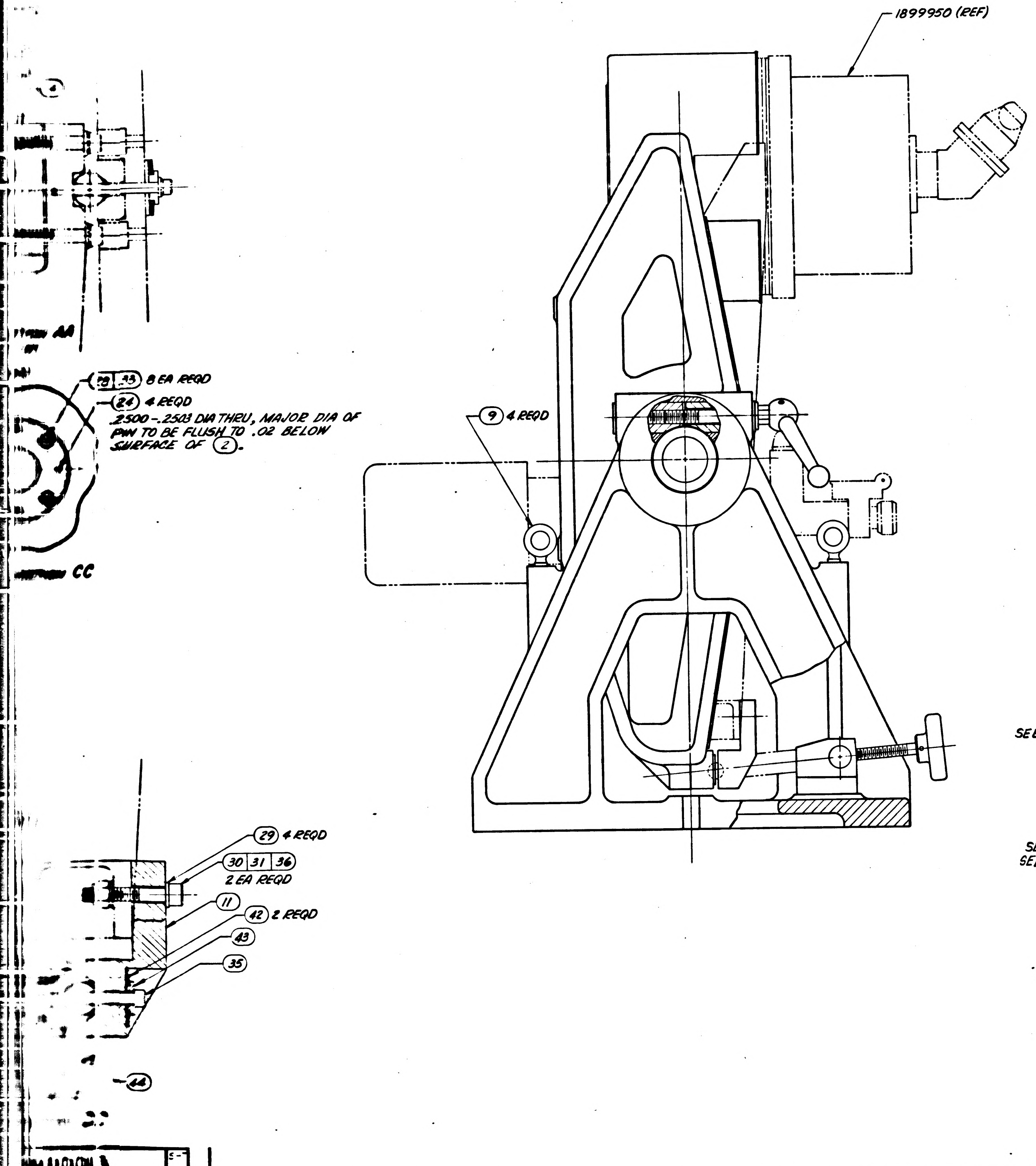
10.250 (REF)
20.000 (REF)
10.000 (REF)
㉘ ㉝ 4 EA REQD
㉔ 2 REQD
.250-.256 DIA THRU, MAJOR DIA OF PIN TO BE FLUSH TO .02 BELOW SURFACE
㉖ 2 REQD
.125-.129 DIA THRU PINS TO BE FLUSH TO .02 BELOW SURFACE SEE NOTE 3.
④ ⑥ ⑦ ㊳ ㊻ SEE NOTE 4
⑤ ⑥ ⑧ ㊳ ㊻ SEE NOTE 4
㉘ ㉝ 2 EA REQD
㊿
(51) 4 REQD

VIEW AA
㉑ NOT SHOWN


㊼
.125-.129 DIA THRU PIN TO BE FLUSH TO .02 BELOW SURFACE
㉒
.27
.23
⑳
⑱

1900013 SHT 1

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		REPLACES REVISION B WITH CHANGE PER MXC-189685 PER TDRR 03880	—	20-SEPT-63	M.G.
D		CHANGE IN ACCORDANCE WITH CM 194673	PER TDRR 8151	4 FEB 64	
E		CHANGE IN ACCORDANCE WITH CM 195279	PER TDRR 8152	1 MAR 64	MEM
F		CHANGE IN ACCORDANCE WITH CM-197090 PER TDRR 08307		13 MAY 64	BK MEM
G		CHANGE IN ACCORDANCE WITH CM 197473 ADDED CUSTOMER DATA (V2-64) REVISED PER TDRR 10037	—	9 MAY 64	JJJ CJP



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 DATE 21 Aug 63

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		64	MS35338-82	WASHER, LOCK
				1		63	AN960C416	(1897006-042) WASHER, FLAT
SEE NOTE 6				1		62	1006783-51	SCREW, BUTTON HD., HEX. SOC.
SEE NOTE 6				1		61	1006783-26	SCREW, BUTTON HD., HEX. SOC.
				1		60	AN960C4L	(1897006-034) WASHER, FLAT
				1		59	MS35338-78	WASHER, LOCK
				1		58	MS16995-9	SCREW, CAP, SOCKET HD.
				2		57	MS16995-26	SCREW, CAP, SOCKET HD.
				3		56	AN960 C8	(1897006-028) WASHER, FLAT
				3		55	MS35338-80	WASHER, LOCK
				1		54	1901364-011	COUPLING ASSY
SEE NOTE 6				1		53	1010400-4	CLAMP, LOOP, HINGED
SEE NOTE 5&6				8		52	1015917-001	T-BOLTS
				4		51	AN-535-0-4	SCREW-DRIVE
				1		50	1901304-210	NAMEPLATE
				AR		49	MIL-L-6085A	OIL, LUBRICATING (ES-89)
				AR		48	MIL-G-3278A	GREASE, LUBRICATING (ES-134)
				1		47	MS 171536	PIN-SPRING
				2		46	1900725-001	HANDLE, SHAFT LOCK
				3		45	1900963	BALL, PRECISION
				3		44	1900972	INSERT, OPTICS MOUNTING
				3		43	1900962	COLLAR, CENTERING
				6		42	1899979	WASHER, SPRING, BELLEVILLE
				1		41	1900968	INSERT, BALL MOUNT, STATIONARY

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		40	1900970-011	INSERT ASSY, BALL MOUNT, LINE
				1		39	1900969-011	INSERT ASSY, BALL MOUNT, PLANE
				2		38	AN960C816	(1897006-082) WASHER-FLAT
				6		37	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
				2		36	MS16998-62	↑
				3		35	MS16998-50	↑
				6		34	MS16995-67	↑
				14		33	MS16995-66	↑
				6		32	MS16995-11	SCREW, CAP, SOCKET HD
				2		31	AN363C524	(1896990-051) NUT-HEX
				2		30	NAS 70V328-563	WASHER, FIBRE
				4		29	AN 960 C 516	(1897006-052) WASHER-FLAT
				21		28	MS 35338-83	WASHER, LOCK
				2		27	AN960C10	(1897006-017) WASHER-FLAT
				2		26	MS 171537	PIN, SPRING
				2		25	MS16995-37	SCREW, CAP, SOCKET HD
SEE NOTE 6				12		24	1016093-001	PIN, STEP
				1		23	1901606-001	SPRING, MP
				1		22	1900632	KNOB
				1		21	1900590	GUARD, BELLOWS, INSEP ASSY
				1		20	1900589	SCREW, DIFFERENTIAL
				1		19	1900588	SEAT, SPRING
				1		18	1900587	PIVOT, ANCHOR
				1		17	1900586	PIVOT, MOVING
				1		16	1900585	BLOCK, MOVING
				1		15	1900584	BLOCK, ANCHOR
				2		14	1900583	SPACER, BALL MOUNT
				2		13	1900582	PAD, UPPER
				1		12	1900581	PAD, LOWER
				1		11	1900580	MOUNT, BALL, LOWER
				2		10	1900579	WASHER, THRUST
SEE NOTE 6				4		9	1015916-002	BOLT, EYE, WELDLESS
				1		8	1900577-002	STUD, SHAFT LOCK
				1		7	1900577-001	STUD, SHAFT LOCK
				2		6	1900576	BUSHING, CLAMP
				1		5	1900575-002	BUSHING, CLAMP, LH THD
				1		4	1900575-001	BUSHING, CLAMP, RH THD
				2		3	1900574	SLEEVE, TRUNNION
				1		2	1900573	CRADLE, FIXTURE, INSEP ASSY
				1		1	1900572	YOKE, FIXTURE

Ⓒ1 REPLACES REV B WITH CHANGE

APPLICATION		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030-011	1900030-011	-011

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-479

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Ackerman DATE 19 MAR 63
CHECKED WILSON 3 SEP 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

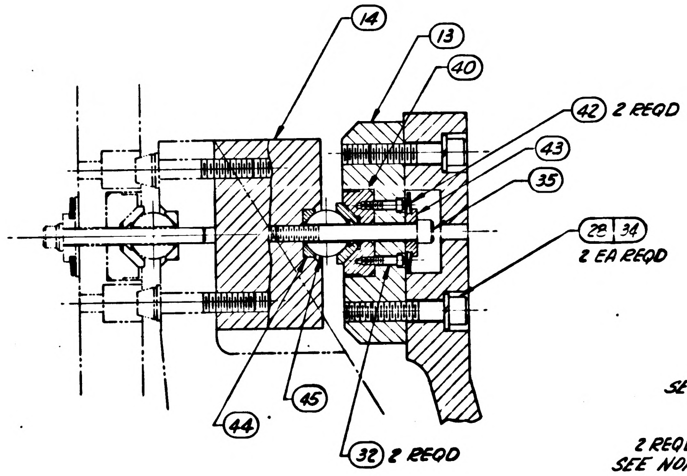
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FIXTURE,
OPTICS NAVIGATION BASE,
ASSEMBLY

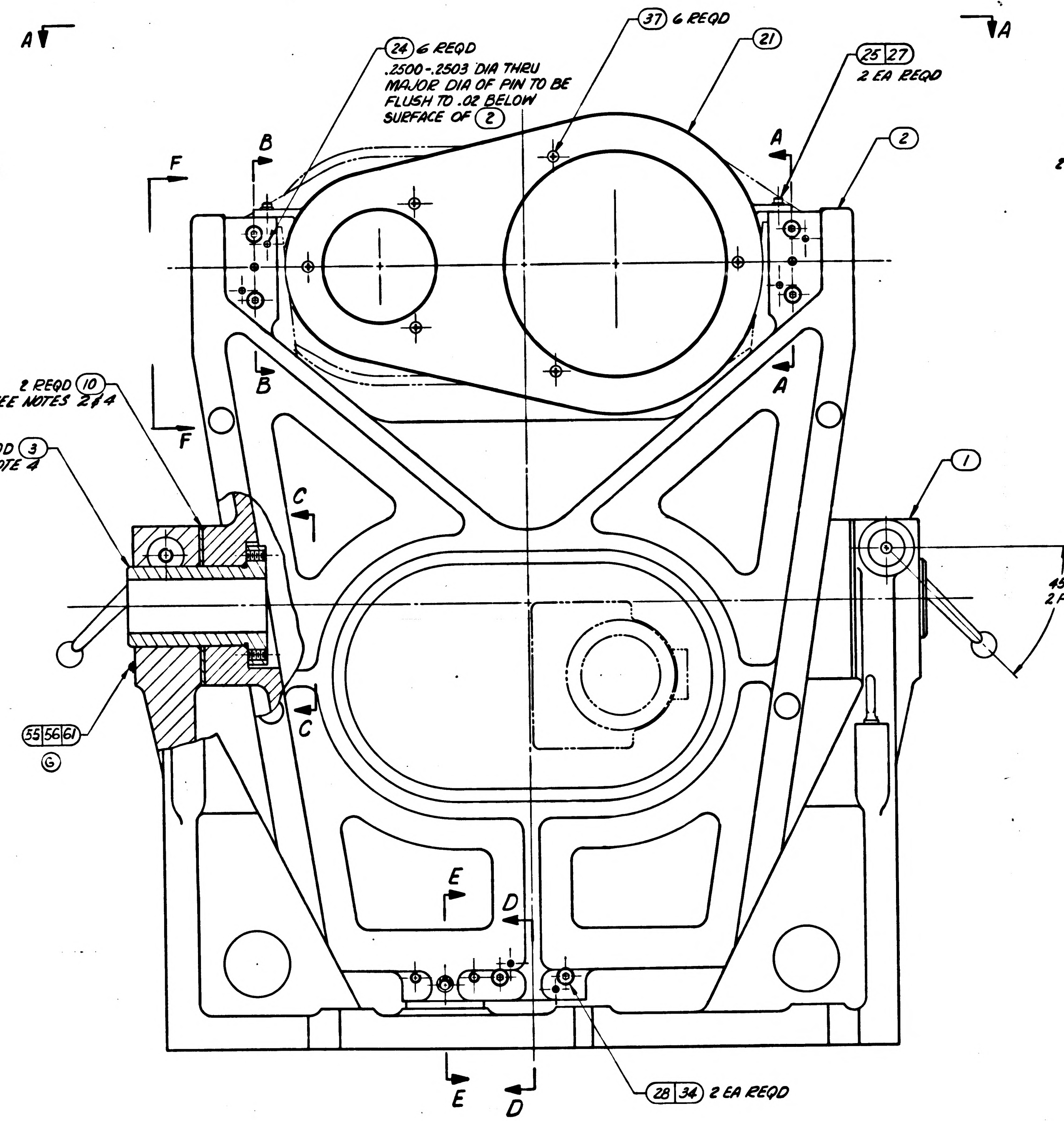
CODE IDENT NO.
SIZE J3
1900013
SCALE 1/2
SHEET 1 OF 1

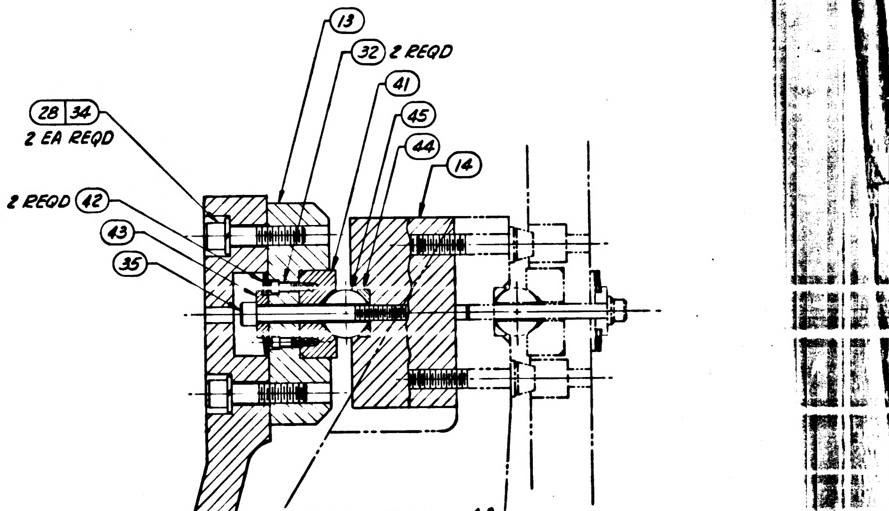
1900013

3/1900013

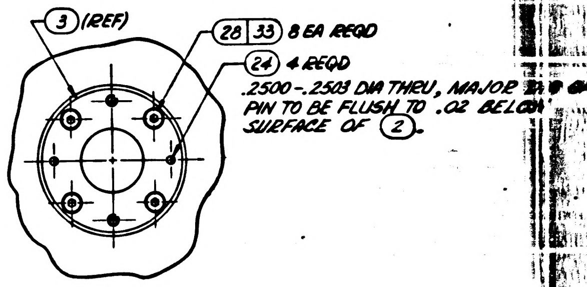

14
13
40
42 2 REQD
43
35
28 34
2 EA REQD
44
45
32 2 REQD

PARTIAL SECTION BB
SCALE 1/1

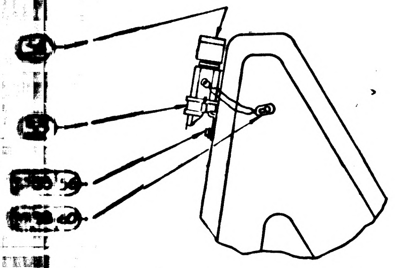

A
24 6 REQD
.2500-.2503 DIA THRU
MAJOR DIA OF PIN TO BE
FLUSH TO .02 BELOW
SURFACE OF 2
37 6 REQD
21
25 27
2 EA REQD
A
B
A
2
F
B
A
F
2 REQD 10
SEE NOTES 2 & 4
2 REQD 3
SEE NOTE 4
C
1
45°±10°
2 PLACES
C
55 56 61
G
E
D
E
D
28 34 2 EA REQD


13
32 2 REQD
28 34
2 EA REQD
41
45
44
14
2 REQD 42
43
35

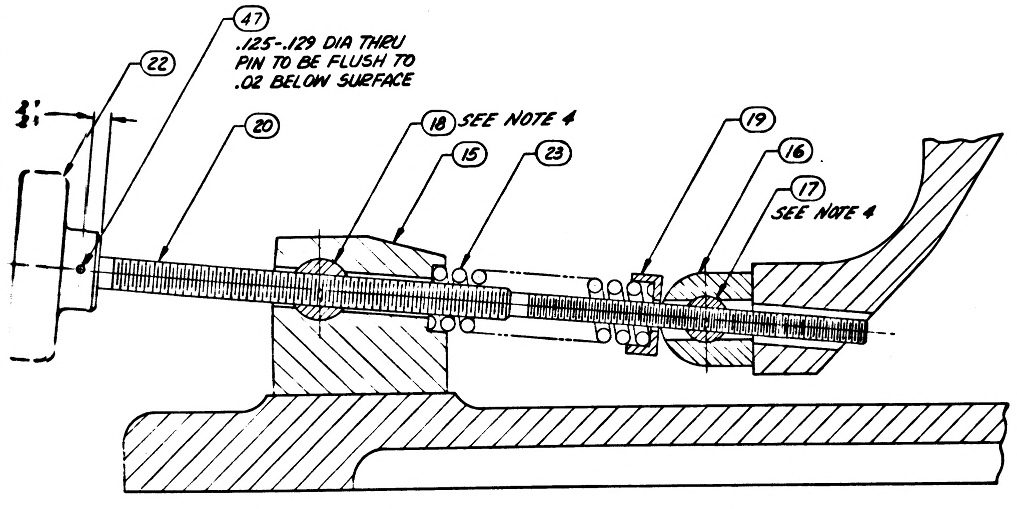
PARTIAL SECTION AA
SCALE 1/1


3 (REF)
28 33 8 EA REQD
24 4 REQD
.2500-.2503 DIA THRU, MAJOR DIA OF
PIN TO BE FLUSH TO .02 BELOW
SURFACE OF 2

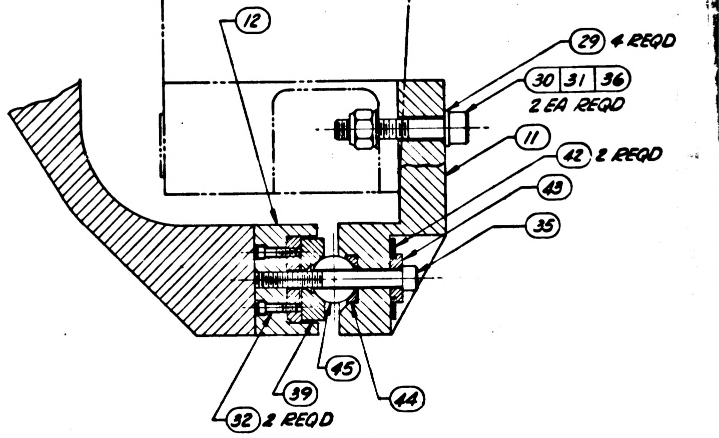
PARTIAL SECTION CC



PARTIAL VIEW 'FF'
SCALE 1:2


47
.125-.129 DIA THRU
PIN TO BE FLUSH TO
.02 BELOW SURFACE
22
20
18 SEE NOTE 4
15
23
19
16
17
SEE NOTE 4

PARTIAL SECTION EE
SCALE 1/1

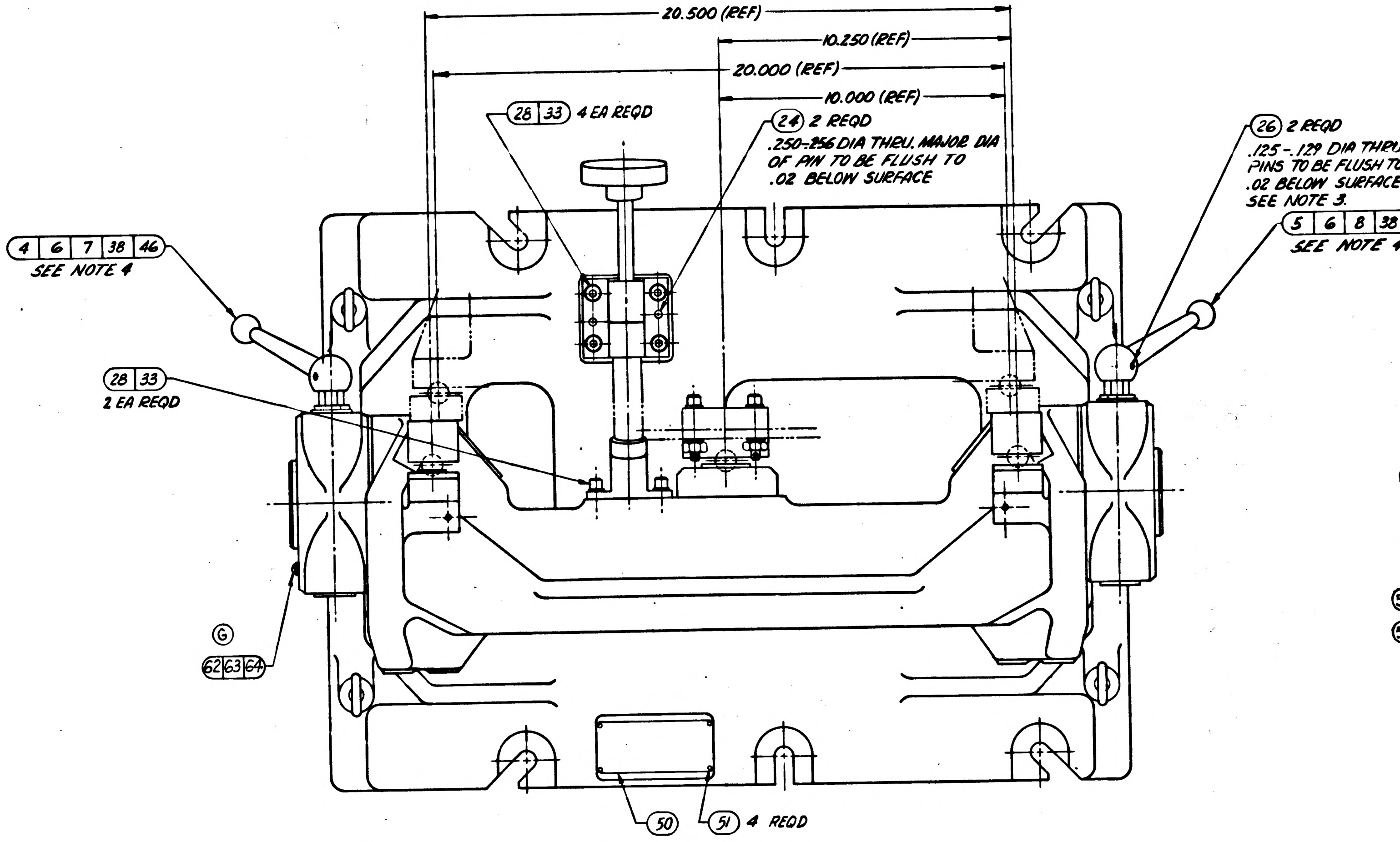

12
29 4 REQD
30 31 36
2 EA REQD
11
42 2 REQD
43
35
39
45
44
32 2 REQD

PARTIAL SECTION DD
SCALE 1/1

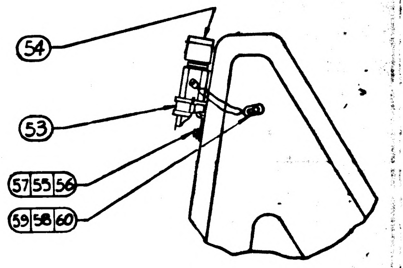
1900013 SHT 1

NOTES:

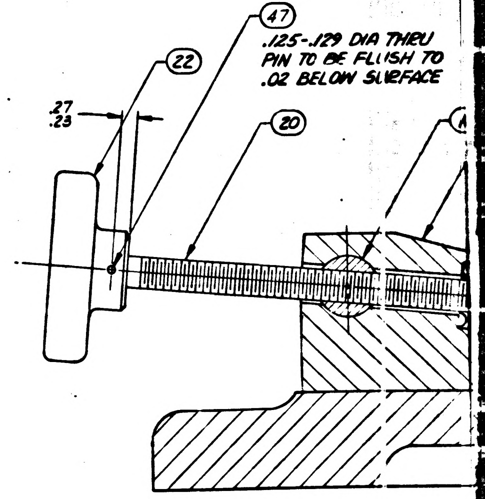
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MACHINE (10) TO ALLOW .003 MAX END PLAY; SURFACE ROUGHNESS NOT TO EXCEED $\sqrt{}^{32}$ AND SURFACES TO BE PARALLEL WITHIN .0005.
3. PIN (46) TO (7) AND (47) TO (8) AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
4. LUBRICATION:
   - A. APPLY THIN COAT OF (48) TO ALL SCREW THREADS AND (17) & (18).
   - B. APPLY THIN FILM OF (49) TO BEARING SURFACES OF (3), (4), (5), (6) AND (10).
5. THE CONFIGURATION OF ITEM (52) IS NOT SHOWN.
6. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.


20.500 (REF)
10.250 (REF)
20.000 (REF)
10.000 (REF)
28 33 4 EA REQD
24 2 REQD
.250-.256 DIA THRU. MAJOR DIA OF PIN TO BE FLUSH TO .02 BELOW SURFACE
26 2 REQD
.125-.129 DIA THRU PINS TO BE FLUSH TO .02 BELOW SURFACE SEE NOTE 3.
5 6 8 38 46
SEE NOTE 4
4 6 7 38 46
SEE NOTE 4
28 33
2 EA REQD
G
62 63 64
50
51 4 REQD

VIEW AA
(21) NOT SHOWN


54
53
57 55 56
59 58 60

PARTIAL VIEW "FF"
SCALE 1:2


47
.125-.129 DIA THRU
PIN TO BE FLUSH TO
.02 BELOW SURFACE
22
.27
.23
20

1900013	SHT 1

MIL FORM 1060 J3

1/1900013

1900014

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		LIST OF MATERIALS ADDED TDRR 02788	DO 51872	13 AUG 63	WEO R.H. DLF

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 **DATE** 28 Aug 63

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4			1015916-003	EYEBOLT-WELDLESS
6			↑ -281	↑
9			MS 35305-242	BOLT-HEX HD
1			↑ -280-3	↑
1			↑ -340-3	↑
2			MS 24692-190-3	PIN-TAPER
1			↑ -98	↑
4			MS 17796-77	BEARING-FLG, OIL IMPREG.
22			↑ -53	↑
24			↑ -12	↑
6			↑ -52	↑
8			MS16995-69	SCREW-HEX SOC. HD.
2			↑ -101	↑
3			MS16556-104	PIN-STRAIGHT
3			MS 1015916-002	EYE BOLT
3			MS21209C-520	INSERT-SCR. THD, LOCKING
1			MS171536	PIN-SPRING
1			MS171602	PIN-SPRING
2			MS 9013-16	RING-RETAINING
6			MS35216-25	SCREW-BUTTON HD.
4			MS16555-48	PIN-STRAIGHT
2			MS171538	PIN-SPRING
2			AN960C816	WASHER-PLAIN
2			MS172211	LOCKWASHER-BRG
2			MS172246	LOCKNUT-BRG
6			↑ -79	↑
24			↑ -81	↑
28			MS35338-82	WASHER-LOCK

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19-MAR-63
CHECKED MALIKOWSKI 25 MAR 63
APPROVAL AMBray 25 MAR 63
APPROVAL C Yedinan 8/27/63
NASA APPROVAL 8/28/63
MIT APPROVAL L. E. Larson Jr. 8/28/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS-IMU-NAVIGATION
BASE FIXTURE

CODE IDENT NO.
SIZE C
1900014
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		LIST OF MATERIALS ADDED TDRR 02788	DO 51872	13 AUG 63	WEO DLF
B		REPLACED WITH CHANGE BY REV C PER MXC-190286. PER TDRR 04095	—	24 SEP 63 23 OCT 63	RJM WK

PICTURE INCOMPLETE

			4			1015916-003	EYEBOLT-WELDLESS
			6			↑ -281	↑
			9			MS 35305-242	BOLT-HEX HD
			1			↑ -280-3	↑
			1			-340-3	
			2			MS 24692-190-3	PIN-TAPER
			1			-98	↑
			4			MS 17796-77	BEARING-FLG, OIL IMPREG.
			22			↑ -53	↑
			24			-12	
			6			-52	
			8			MS16995-69	SCREW-HEX SOC.HD.
			2			↑ -101	↑
			3			MS16556-104	PIN-STRAIGHT
			3			MS1015916-002	EYE BOLT
			3			MS21209C-520	INSERT-SCR.THD, LOCKING
			1			MS171536	PIN-SPRING
			1			MS171602	PIN-SPRING
			2			MS9013-16	RING-RETAINING
			6			MS35216-25	SCREW-BUTTON HD.
			4			MS16555-48	PIN-STRAIGHT
			2			MS171538	PIN-SPRING
			2			AN960C816	WASHER-PLAIN
			2			MS172211	LOCKWASHER-BRG
			2			MS172246	LOCKNUT-BRG
			6			↑ -79	↑
			24			-81	
			28			MS 35338-82	WASHER-LOCK
			011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 **DATE** 28 Aug 63

Ⓑ REPLACED WITH CHANGE BY REV "C"

1900030	1900030	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES. TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. FLUDER DATE 19-MAR-63
CHECKED MALIKOWSKI 25 MAR 63
APPROVAL QMBray 25 MAR 63
APPROVAL 8/27/63
NASA APPROVAL 8/28/63
MIT APPROVAL 8/28/63

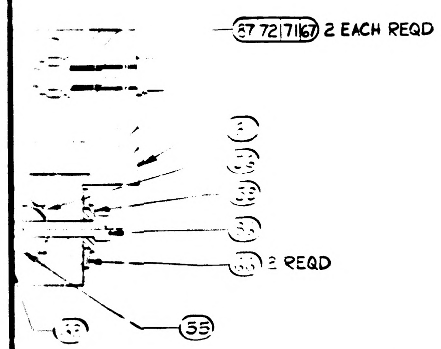
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

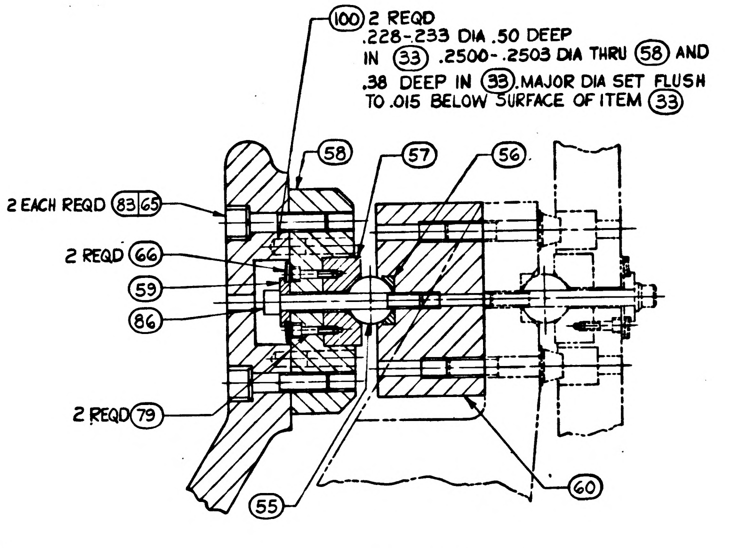
OPTICS-IMU-NAVIGATION
BASE FIXTURE

CODE IDENT NO.
SIZE C
1900014
SCALE —
SHEET

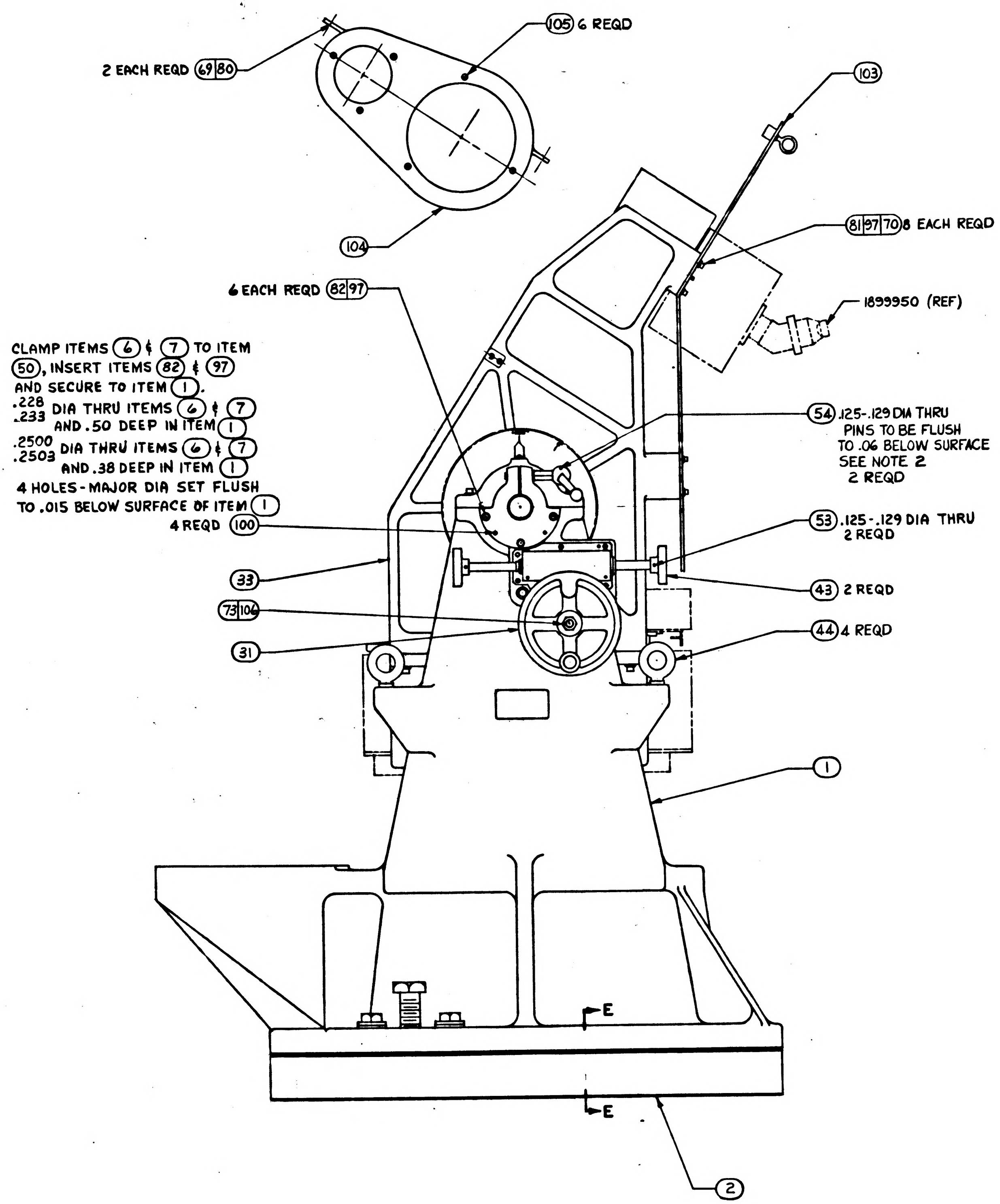
MIL 1078C—P

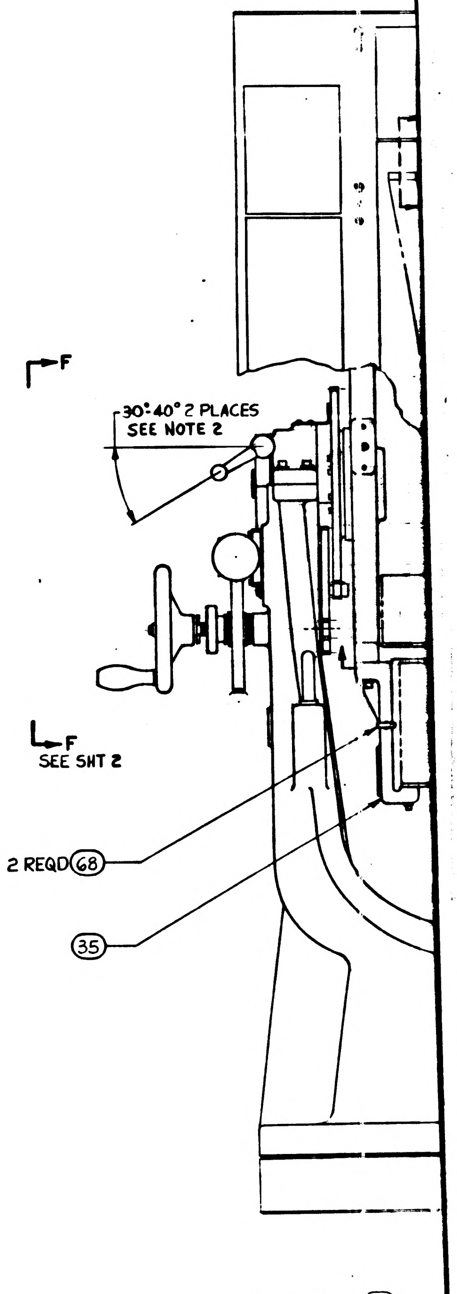
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

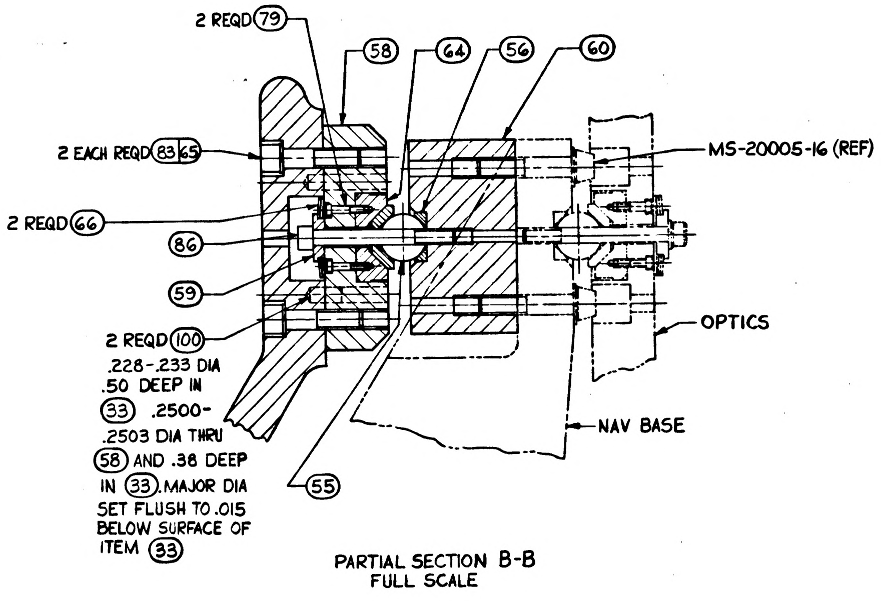

57 72 71 67 2 EACH REQD
2 REQD
55


100 2 REQD
.228-.233 DIA .50 DEEP
IN 33 .2500-.2503 DIA THRU 58 AND
.38 DEEP IN 33. MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 33
58
57
56
2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79
55
60

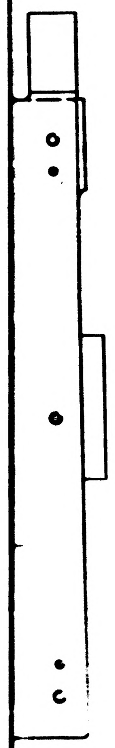
PARTIAL SECTION A-A
FULL SCALE


105 6 REQD
2 EACH REQD 69 80
103
104
81 97 70 8 EACH REQD
6 EACH REQD 82 97
1899950 (REF)
CLAMP ITEMS 6 & 7 TO ITEM
50, INSERT ITEMS 82 & 97
AND SECURE TO ITEM 1.
.228
.233 DIA THRU ITEMS 6 & 7
AND .50 DEEP IN ITEM 1
.2500
.2503 DIA THRU ITEMS 6 & 7
AND .38 DEEP IN ITEM 1
4 HOLES-MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 1
4 REQD 100
54 .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
53 .125-.129 DIA THRU
2 REQD
33
43 2 REQD
73 106
44 4 REQD
31
1
E
E
2


F
30°-40° 2 PLACES
SEE NOTE 2
F
SEE SHT 2
2 REQD 68
35
2 REQD


2 REQD 79
58
64
56
60
2 EACH REQD 83 65
MS-20005-16 (REF)
2 REQD 66
86
59
OPTICS
2 REQD 100
.228-.233 DIA
.50 DEEP IN
33 .2500-
.2503 DIA THRU
58 AND .38 DEEP
IN 33. MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM 33
NAV BASE
55

PARTIAL SECTION B-B
FULL SCALE

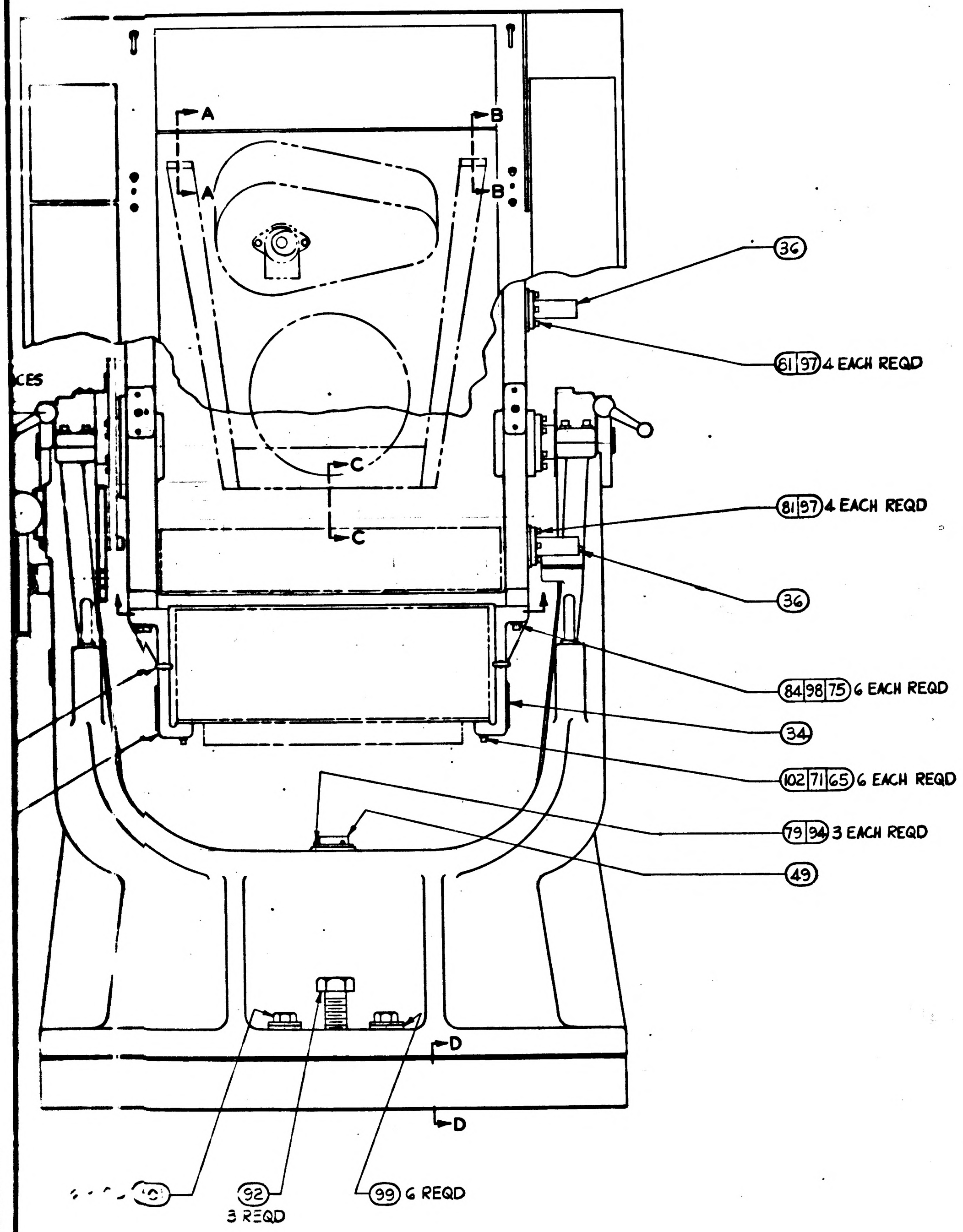


1900014 SH 1

1900014

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. *REVISED PER TDR 04045*	-	24 SEP 63	RJM



FOR INFORMATION ONLY

CLASS II RELEASE TDR No. 02788 DATE 26 Aug 63

Ⓒ REPLACES REV "B" WITH CHANGE

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		108		PLATE, IDENTIFICATION
				6		107	AN960C6L	WASHER-FLAT
				1		106		NUT-SELF LOCKING
				6		105	AN526C1032R8	SCREW, TRUSS HD
				1		104	1900590	GUARD AND SEAL ASSY
				1		103	1900552	RACK
				6		102	MS-16995-68	SCREW, HEX SOC
				6		101	MS35305-240	SCREW, CAP
				14		100	1016093-001	PIN-STEP DOWEL
				6		99	1016095-007	WASHER-SPHERICAL
				6		98	MS35338-84	WASHER-LOCK, SPLIT
				46		97	MS35338-82	WASHER-LOCK, SPLIT
				24		96	MS35338-81	WASHER-LOCK, SPLIT
				6		95	MS35338-79	WASHER-LOCK, SPLIT
				3		94	MS35338-78	WASHER-LOCK, SPLIT
				9		93	MS35305-242	SCREW, CAP
				3		92	MS35300-316	SCREW, CAP
				6		91	MS35216-25	SCREW, MACHINE, PAN HD
				1		90	MS24692-162	PIN-TAPER
				1		89	MS24692-189	PIN-TAPER
				2		88	MS24692-108	PIN-TAPER
				2		87	MS16998-62	SCREW-HEX SOC
				3		86	MS16998-50	SCREW-HEX SOC
				24		85	MS16996-12	SCREW, CAP
				6		84	MS16995-84	SCREW, CAP
				6		83	MS16995-67	SCREW, CAP
				24		82	MS16995-53	SCREW, CAP
				22		81	MS16995-52	SCREW, CAP
				2		80	MS16995-37	SCREW, CAP
				9		79	MS16995-11	SCREW, CAP
				3		78	MS16556-104	PIN-STRAIGHT
				2		77	MS16556-101	PIN-STRAIGHT
				4		76	MS16555-648	PIN-STRAIGHT
				6		75	MS15795-315	WASHER, FLAT
				9		74	MS15795-127	WASHER, FLAT
				3		73	AN960C816	WASHER, FLAT
				2		72	AN363C524	NUT-SELF LOCKING
				8		71	AN960C516	WASHER, FLAT
				8		70	AN960C416	WASHER, FLAT
				2		69	AN960C10	WASHER, FLAT
SEE NOTE 3				2		68	1015916-001	BOLT-EYE
				2		67	NAS70V328-563	WASHER-FIBRE
				6		66	1899979	WASHER-BELLEVILLE
				12		65	MS-35338-83	WASHER-LOCK
				1		64	1011739	INSERT-BALL MOUNT ASSY
				1		63	1900581	PAD
				1		62	1011738	INSERT-BALL MOUNT ASSY
				1		61	1900580	MOUNT-BALL
				2		60	1900583	SPACER-BALL MOUNT
				3		59	1899976	COLLAR-CENTERING
				2		58	1900582	PAD
				1		57	1011566	INSERT-BALL MOUNT
				3		56	1899965	INSERT
				3		55	1899967	BALL
				2		54	MS-171537	PIN-SPRING
				2		53	MS-171536	PIN-SPRING
				1		52	MS-24585-C499	SPRING
				1		51	MS171600	PIN, SPRING
				2		50	1900624	SHAFT-TRUNNION
				1		49		LEVEL-CIRCULAR MOUNTED
				1		48	MS-16624-4075	RING, RETAINING
				1		47		BEARING-THRUST
				2		46		BEARING-FLANGED
				1		45	MS-16624-4062	RING-RETAINING
SEE NOTE 3				4		44	1015916-003	BOLT-EYE
				2		43	1900632	KNOB, FINE ADJUST
				1		42	MS-17796-98	BEARING, SLEEVE
				1		41	MS-17796-89	BEARING, SLEEVE
				3		40	MS-17796-77	BEARING, SLEEVE, FLANGE TYPE

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			2		39	MS-172211	WASHER, KEY, BEARING RETAINING
			2		38	MS-172246	NUT, SPANNER
			2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
			2		36	1900571	SHAFT, STOP
			1		35	1900716	BRACKET, MOUNTING (L.H.)
			1		34	1900715	BRACKET, MOUNTING (R.H.)
			1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
			1		32	1900776	WORM R.H.
			1		31	1900724	HANDWHEEL
			1		30	1900723	WASHER
			1		29	1900722	GEAR, INTERMEDIATE
			1		28	1900721	GUIDE, SPRING
			1		27	1900720	WASHER, SPRING
			2		26	1900647	PINION
			1		25	1900646	COVER-WORM
			1		24	1900645	SHIM, LAMINATED
			1		23	1900644	BRACKET, WORM
			1		22	1900643	SHAFT, WORM, FINE ADJUST
			1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
			1		20	1900641	WASHER, THRUST
			1		19	1900640	GEAR-WORM R.H.
			1		18	1900639	SHAFT, COARSE ADJUST
			2		17	1900638	WASHER
			1		16	1900637	SHAFT, GEAR
			1		15	1900636	POINTER-INDEX
			1		14	1900635	GEAR-OUTPUT
			1		13	1900634	CAP, BEARING
			1		12	1900633	CAP, BEARING
			2		11	1900725	LEVER, SHAFT LOCK
			1		10	1900631	WASHER, THRUST
			1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
			1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
			1		7	1900629	LOCK-SHAFT (L.H.)
			1		6	1900628	LOCK-SHAFT (R.H.)
			1		5	1900627	RETAINER, BEARING
			1		4	1900626	RETAINER, BEARING
			2		3	1900625	CARTRIDGE, BEARING
			1		2	1900622	RING-BASE
			1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

LIST OF PARTS AND MATERIALS

C	C
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

APPLICATION		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED C. Lang 16 SEP 63
APPROVAL [illegible] 17 SEP 63
APPROVAL J Gedeman 10/21/63
NASA APPROVAL J Bernard
MIT APPROVAL [illegible] 9/23/63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

G & N MOUNTING FIXTURE ASSEMBLY

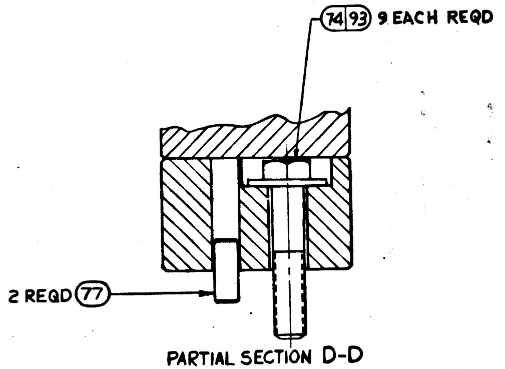
CODE IDENT NO.
SIZE 3
1900014
SCALE 1:4
SHEET [illegible] OF 2

900014 S-

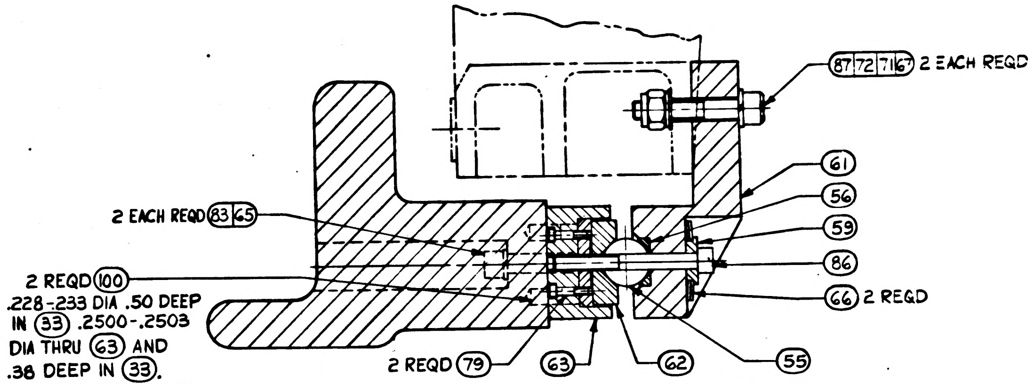
1900014

1900014
GENERAL MOTORS CORPORATION
AC SPARK PLUG DIVISION

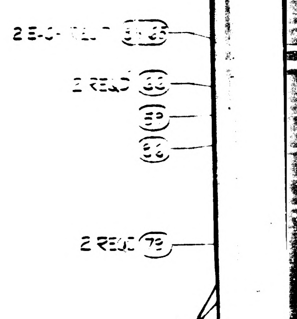
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. PIN ⑪ TO ⑧ OR ⑨ AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

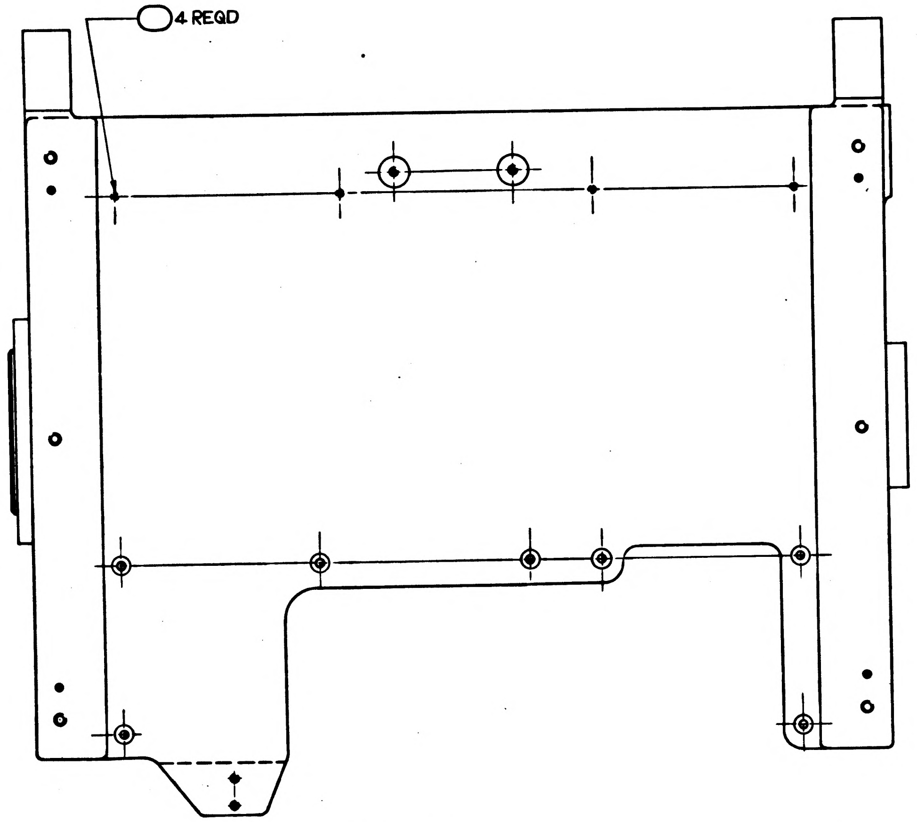

74 93 9 EACH REQD
2 REQD 77

PARTIAL SECTION D-D
SCALE 1:2

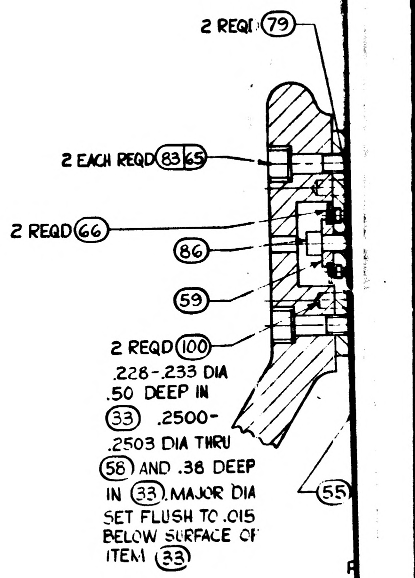

87 72 71 67 2 EACH REQD
61
56
59
86
66 2 REQD
55
62
63
2 REQD 79
2 EACH REQD 83 65
2 REQD 100
.228-.233 DIA .50 DEEP
IN 33 .2500-.2503
DIA THRU 63 AND
.38 DEEP IN 33.
MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE
OF ITEM 33

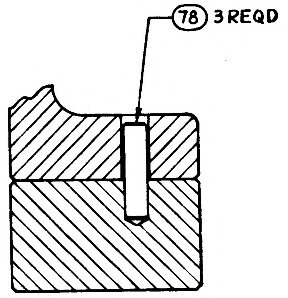
PARTIAL SECTION C-C
FULL SCALE





VIEW G-G
SCALE 1:2


2 REQD 79
2 EACH REQD 83 65
2 REQD 66
86
59
2 REQD 100
.228-.233 DIA
.50 DEEP IN
33 .2500-
.2503 DIA THRU
58 AND .38 DEEP
IN 33. MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM 33
55

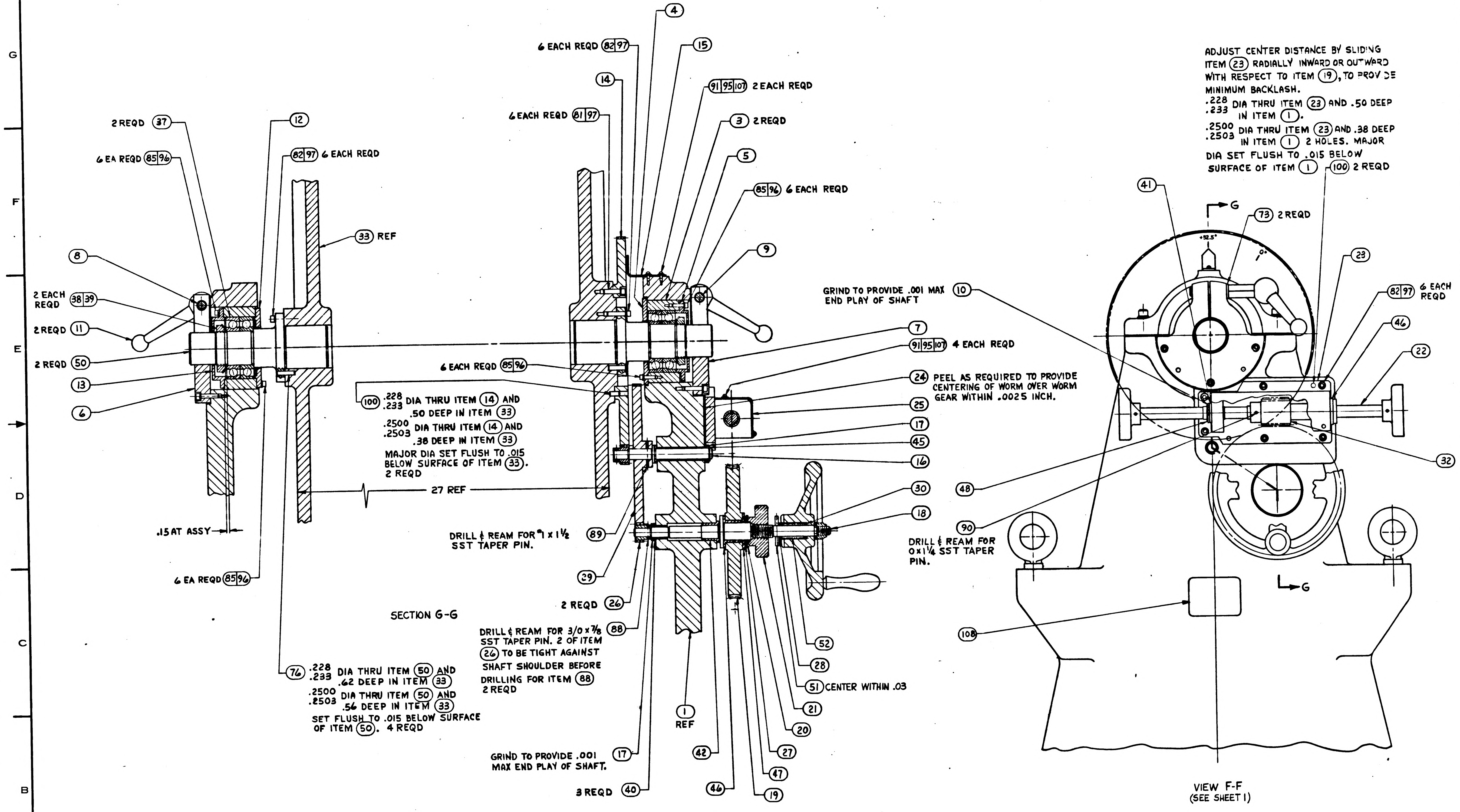


PARTIAL SECTION E-E
SCALE 1:2

1900014

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C	-	THIS SHEET ADDED PER MXC-190286. PER TDRR 06095		24 SEP 63	RJM



2 REQD ㊲
⑫
6 EA REQD (85)(96)
(82)(97) 6 EACH REQD
㉝ REF
⑧
2 EACH REQD ㊳㊴
2 REQD ⑪
2 REQD ㊿
⑬
⑥
.15 AT ASSY
6 EA REQD (85)(96)
④
6 EACH REQD (82)(97)
⑮
⑭
(91)(95)(107) 2 EACH REQD
6 EACH REQD (81)(97)
③ 2 REQD
⑤
(85)(96) 6 EACH REQD
⑨
⑩
⑦
(91)(95)(107) 4 EACH REQD
6 EACH REQD (85)(96)
㉔
㉕
⑰
㊺
⑯
27 REF
㉚
⑱
(89)
㉙
2 REQD ㉖
(88)
(52)
㉘
(51) CENTER WITHIN .03
㉑
⑳
㉗
㊼
⑲
㊻
㊷
① REF
⑰
3 REQD ㊵
(76)
㊶
(73) 2 REQD
㉓
(82)(97) 6 EACH REQD
㊻
㉒
㉜
㊽
(90)
(108)
(100) 2 REQD
+12.5°
0°
G
G

GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT ⑩

㉔ PEEL AS REQUIRED TO PROVIDE CENTERING OF WORM OVER WORM GEAR WITHIN .0025 INCH.

(100) $\genfrac{}{}{0pt}{}{.228}{.233}$ DIA THRU ITEM ⑭ AND .50 DEEP IN ITEM ㉝

$\genfrac{}{}{0pt}{}{.2500}{.2503}$ DIA THRU ITEM ⑭ AND .38 DEEP IN ITEM ㉝

MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM ㉝. 2 REQD

DRILL & REAM FOR #7 x 1½ SST TAPER PIN. (89)

DRILL & REAM FOR 3/0 x ⅞ SST TAPER PIN. 2 OF ITEM ㉖ TO BE TIGHT AGAINST SHAFT SHOULDER BEFORE DRILLING FOR ITEM (88) 2 REQD

DRILL & REAM FOR 0 x 1¼ SST TAPER PIN.

(76) $\genfrac{}{}{0pt}{}{.228}{.233}$ DIA THRU ITEM ㊿ AND .62 DEEP IN ITEM ㉝

$\genfrac{}{}{0pt}{}{.2500}{.2503}$ DIA THRU ITEM ㊿ AND .56 DEEP IN ITEM ㉝

SET FLUSH TO .015 BELOW SURFACE OF ITEM ㊿. 4 REQD

GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT. ⑰

SECTION G-G

ADJUST CENTER DISTANCE BY SLIDING ITEM ㉓ RADIALLY INWARD OR OUTWARD WITH RESPECT TO ITEM ⑲, TO PROVIDE MINIMUM BACKLASH.

$\genfrac{}{}{0pt}{}{.228}{.233}$ DIA THRU ITEM ㉓ AND .50 DEEP IN ITEM ①.

$\genfrac{}{}{0pt}{}{.2500}{.2503}$ DIA THRU ITEM ㉓ AND .38 DEEP IN ITEM ① 2 HOLES. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM ① (100) 2 REQD

VIEW F-F
(SEE SHEET 1)

FOR INFORMATION ONLY

CLASS 8 RELEASE TDR No. 02788 DATE 11 Oct 63

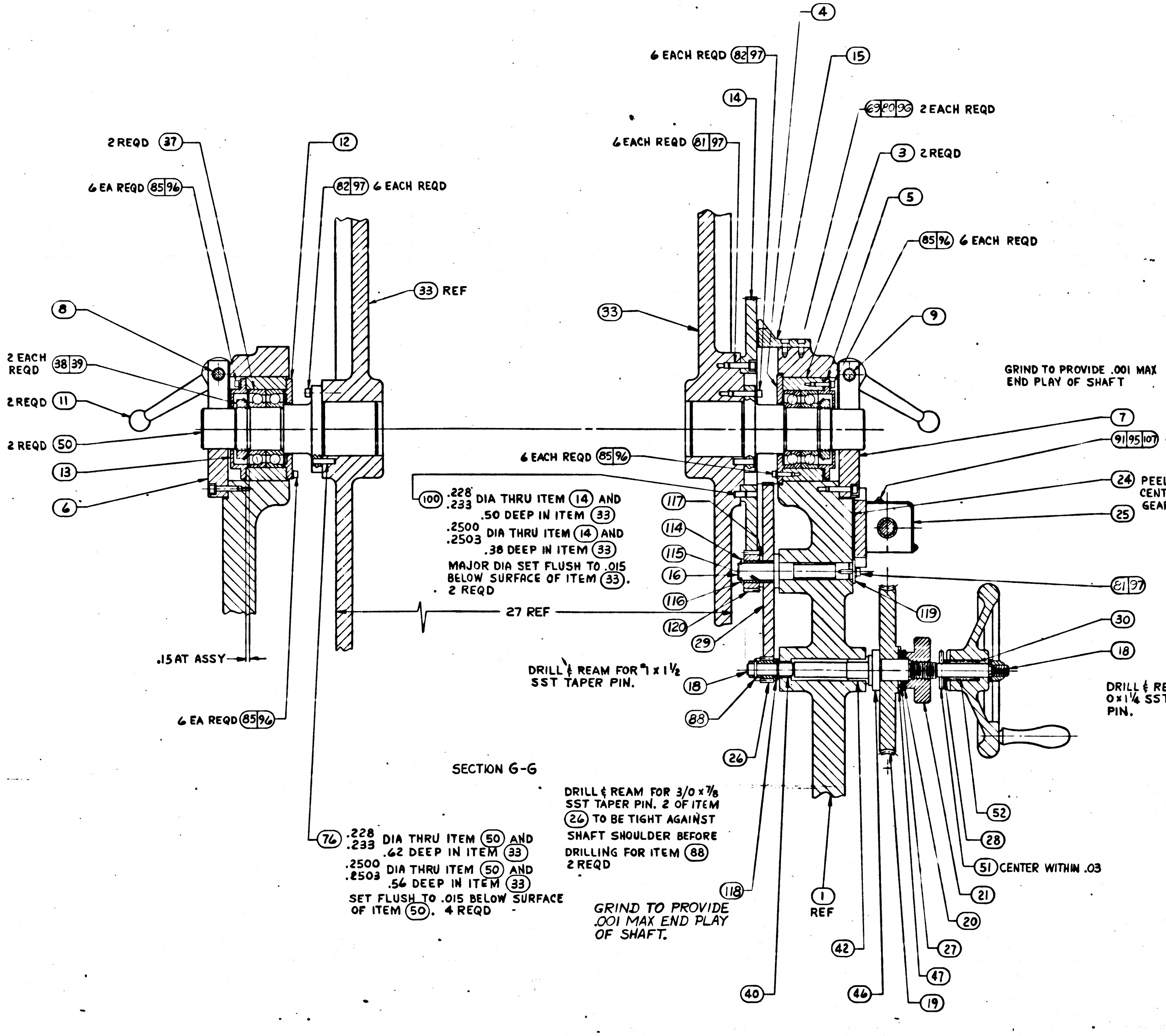
Ⓒ THIS SHEET ADDED

1900030-011	1900030-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — — — DECIMALS ±.005 ±.02 ANGLES + — — —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN Schwabe DATE 19 MAR 63 CHECKED C. Leny 16 SEP '63 APPROVAL R.C. [illegible] 17 SEP '63 APPROVAL L. Gelman 10/21/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
NEXT ASSY	USED ON	DO NOT SCALE THIS DRAWING	NASA APPROVAL [illegible]	G & N MOUNTING FIXTURE ASSEMBLY	
APPLICATION		MATERIAL	MIT APPROVAL [illegible]	CODE IDENT NO.	SIZE E
		CONTRACT NAS 9-497		SCALE 1:2	1900014 SHEET 2 OF 2

1900014 C

1900014

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	THIS SHEET ADDED PER MXC-190286. PER JDRR 04045		24 SEP 63	RJM
E		CHANGE IN ACCORDANCE WITH MXC 131288 C, +55		13-JAN-63	


(4)
6 EACH REQD (82|97)
(15)
(14)
(69|80|96) 2 EACH REQD
6 EACH REQD (81|97)
(3) 2 REQD
2 REQD (37)
(12)
(5)
6 EA REQD (85|96)
(82|97) 6 EACH REQD
(85|96) 6 EACH REQD
(33) REF
(33)
(8)
(9)
2 EACH REQD (38|39)
2 REQD (11)
2 REQD (50)
(13)
(6)
(7)
6 EACH REQD (85|96)
(117)
(114)
(115)
(16)
(116)
(120)
(29)
(25)
(81|97)
(119)
(30)
(18)
27 REF
.15 AT ASSY
(18)
(88)
(26)
6 EA REQD (85|96)
(118)
(1) REF
(42)
(40)
(46)
(19)
(47)
(27)
(20)
(21)
(51) CENTER WITHIN .03
(28)
(52)

(100) .228/.233 DIA THRU ITEM (14) AND .50 DEEP IN ITEM (33)
.2500/.2503 DIA THRU ITEM (14) AND .38 DEEP IN ITEM (33)
MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33).
2 REQD

DRILL & REAM FOR #1 x 1½ SST TAPER PIN.

SECTION G-G

(76) .228/.233 DIA THRU ITEM (50) AND .62 DEEP IN ITEM (33)
.2500/.2503 DIA THRU ITEM (50) AND .56 DEEP IN ITEM (33)
SET FLUSH TO .015 BELOW SURFACE OF ITEM (50). 4 REQD

DRILL & REAM FOR 3/0 x 7/8 SST TAPER PIN. 2 OF ITEM (26) TO BE TIGHT AGAINST SHAFT SHOULDER BEFORE DRILLING FOR ITEM (88) 2 REQD

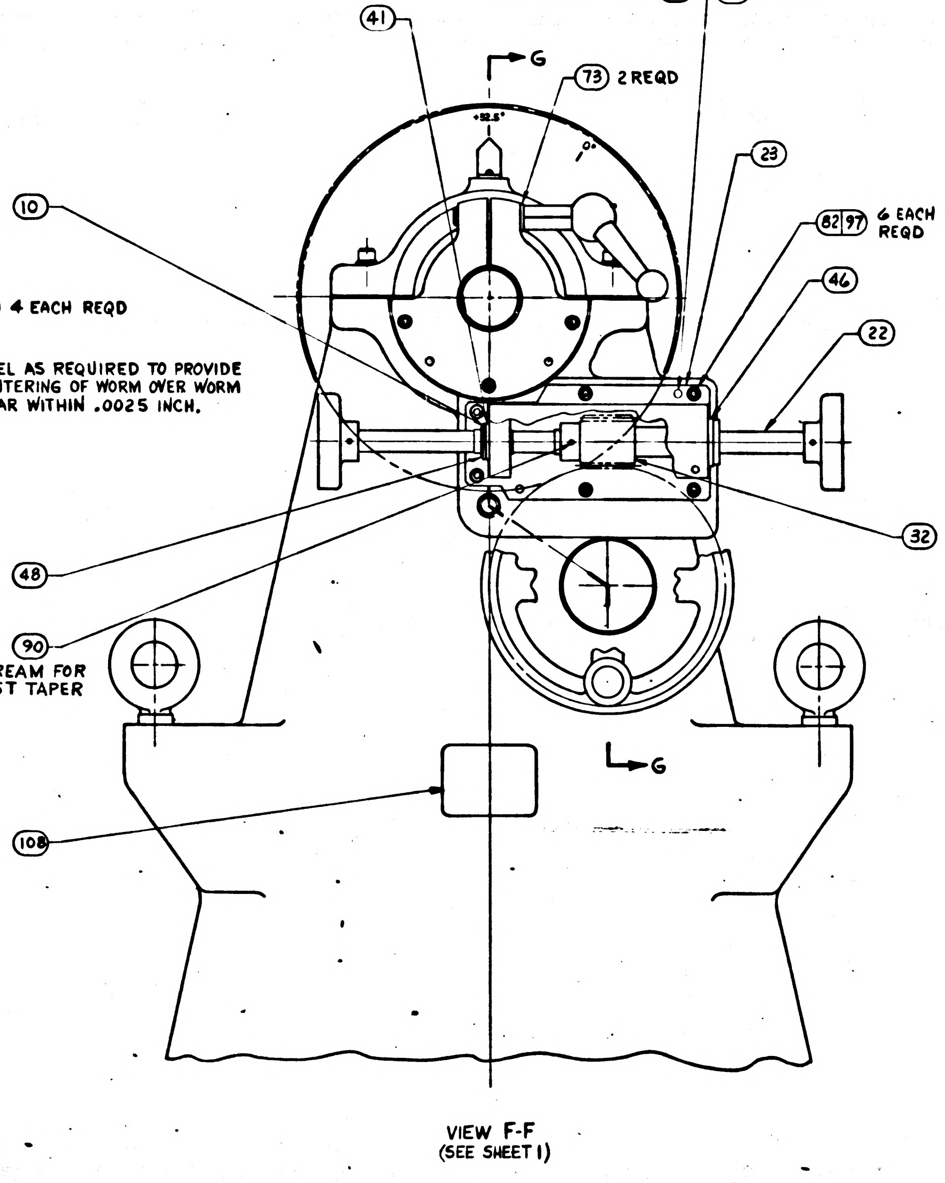
GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT.

GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT (10)

(91|95|107) 4 EACH REQD

(24) PEEL AS REQUIRED TO PROVIDE CENTERING OF WORM OVER WORM GEAR WITHIN .0025 INCH.

ADJUST CENTER DISTANCE BY SLIDING ITEM (23) RADIALLY INWARD OR OUTWARD WITH RESPECT TO ITEM (19), TO PROVIDE MINIMUM BACKLASH.
.228/.233 DIA THRU ITEM (23) AND .50 DEEP IN ITEM (1).
.2500/.2503 DIA THRU ITEM (23) AND .38 DEEP IN ITEM (1) 2 HOLES. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (1) (100) 2 REQD


(41)
G
(73) 2 REQD
+32.5°
0°
(23)
(82|97) 6 EACH REQD
(46)
(22)
(32)
(48)
(90)
(108)
G

DRILL & REAM FOR 0 x 1¼ SST TAPER PIN.

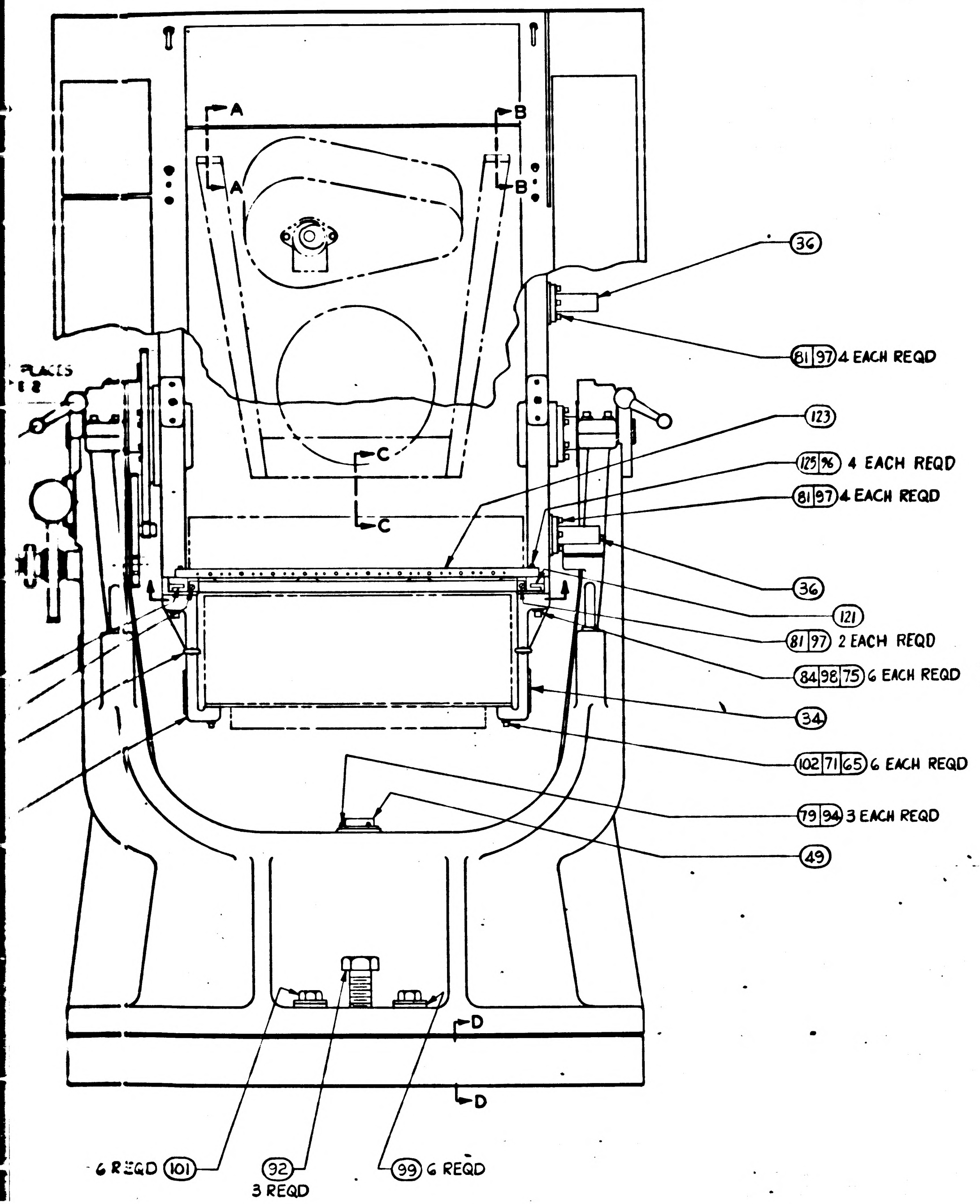
VIEW F-F
(SEE SHEET 1)

FOR INFORMATION ONLY
CLASS B' RELEASE TDR No. 02788 DATE

©THIS SHEET ADDED

1900030-011	1900030-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +— —— DECIMALS ±.005 ±.02 ANGLES +— —— DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
NEXT ASSY	USED ON	MATERIAL	DRAWN Schwabe DATE 19 MAR 63 CHECKED C. Young 16 SEP '63 APPROVAL APPROVAL 10/24/63	G & N MOUNTING FIXTURE ASSEMBLY	
APPLICATION		CONTRACT NAS 9-497	NASA APPROVAL MIT APPROVAL	CODE IDENT NO.	SIZE E	1900014
				SCALE 1:2	SHEET 2 OF 2

1900014 E



	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				4		125	MS-16996-14	SCREW-CAP SOC. HD.
				4		124	AN535-0-4	SCREW-DRIVE
				1		123	1900874	CAP-TOE, GSE, PSA
				1		122	1901348	BRACKET-SUPPORT R.H.
				1		121	1901347	BRACKET-SUPPORT L.H.
				1		120	1900939	PINION-CHANGE GEAR
				1		119	1900938	WASHER
				1		118	1900937	WASHER-STEP
				1		117	900936	SPACER
				1		116	MS-16624-4075	RING-RETAINING
				1		115	1900940	BUSHING-COMPOUND
				1		114	1900935	WASHER-FLAT
SEE NOTE 3				4		113	1000159-6	PACKING, PREFORMED O-RING
				2		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
				2		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
				1		110	1900850	COLDPLATE, CDU (INSEP. ASS'Y)
				1		109	1900819	COLDPLATE, PSA, (INSEP. ASS'Y)
				1		108	1901304-211	PLATE, IDENTIFICATION
				4		107	AN960C6L	(1897006-036 WASHER-FLAT
				1		106	NAS1408C8	(1896868-108) NUT-SELF LOCKING
				6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
				1		104	1900590	GUARD AND SEAL ASSY
				1		103	1900552	RACK
				6		102	MS-16995-68	SCREW, HEX SOC
				6		101	MS35305-240	SCREW, CAP
				14		100	1016093-001	PIN-STEP DOWEL
				6		99	1016095-007	WASHER-SPHERICAL
				6		98	MS35338-84	WASHER-LOCK, SPLIT
				51		97	MS35338-82	WASHER-LOCK, SPLIT
				30		96	MS35338-81	WASHER LOCK, SPLIT
				4		95	MS35338-79	WASHER-LOCK, SPLIT
				3		94	MS35338-78	WASHER-LOCK, SPLIT
				9		93	MS35305-242	SCREW, CAP
				3		92	MS35300-316	SCREW, CAP
				4		91	MS35216-25	SCREW, MACHINE, PAN HD
				1		90	MS24692-162	PIN-TAPER
				1		89	MS24692-189	PIN-TAPER
				2		88	MS24692-108	PIN-TAPER
				2		87	MS16998-62	SCREW-HEX SOC
				3		86	MS16998-50	SCREW-HEX SOC
				24		85	MS16996-12	SCREW, CAP
				6		84	MS16995-84	SCREW, CAP
				6		83	MS16995-67	SCREW, CAP
				24		82	MS16995-53	SCREW, CAP
				27		81	MS16995-52	SCREW, CAP
				4		80	MS16995-37	SCREW, CAP
				9		79	MS16995-11	SCREW, CAP
				3		78	MS16556-104	PIN-STRAIGHT
				2		77	MS16556-101	PIN-STRAIGHT
				4		76	MS16555-648	PIN-STRAIGHT
				6		75	MS15795-315	WASHER, FLAT
				9		74	MS15795-126	WASHER, FLAT
				3		73	AN960C816	(1897006-082) WASHER-FLAT
				2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
				8		71	AN960C516	(1897006-052) WASHER-FLAT
				8		70	AN960C416	(1897006-042) WASHER-FLAT
				4		69	AN960C10	(1897006-017) WASHER-FLAT
SEE NOTE 3				2		68	1015916-001	BOLT-EYE
				2		67	NAS70V328-563	WASHER-FIBRE
				6		66	1899979	WASHER-BELLEVILLE
				12		65	MS-35338-83	WASHER-LOCK
				1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
				1		63	1900581	PAD
				1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
				1		61	1900580	MOUNT-BALL
				2		60	1900583	SPACER-BALL MOUNT
				3		59	1900962	COLLAR-CENTERING
				2		58	1900582	PAD
				1		57	1900968	INSERT-BALL MOUNT. STAT.
				3		56	1900972	INSERT
				3		55	1900963	BALL-PRECISION
				2		54	MS-171537	PIN-SPRING
				2		53	MS-171536	PIN-SPRING
				1		52	MS-24585-C499	(1897067-499) SPRING
				1		51	MS171600	PIN, SPRING
				2		50	1900624	SHAFT-TRUNNION
				1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
				1		48	MS-16624-4075	RING, RETAINING
				1		47		BEARING-THRUST
				1		46	MS-17796-112	BEARING-SLEEVE
						45		
SEE NOTE 3				4		44	1015916-003	BOLT-EYE
				2		43	1900632	KNOB, FINE ADJUST
				~~1~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
				1		41	MS-17796-89	BEARING, SLEEVE
				~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~

LIST OF PARTS AND MATERIALS

H	E
G	E
F	E
E	E
D	C
C	C
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 04045	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		13 JAN -64	MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 07455		13 JAN -64	MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 07456		13 JAN 64	MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 07457		3 FEB 64	MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR 07458		26 FEB 64	W.E.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02798 DATE

© REPLACES REV "B" WITH CHANGE

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2		39	MS-172211	WASHER, KEY, BEARING RETAINING
			2		38	MS-172246	NUT, SPANNER
			2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
			2		36	1900571	SHAFT, STOP
			1		35	1900716	BRACKET, MOUNTING (L.H.)
			1		34	1900715	BRACKET, MOUNTING (R.H.)
			1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
			1		32	1900776	WORM R.H.
			1		31	1900724	HANDWHEEL
			1		30	1900723	WASHER
			1		29	1900722	GEAR, INTERMEDIATE
			1		28	1900721	GUIDE, SPRING
			1		27	1900720	WASHER, SPRING
			1		26	1900647	PINION
			1		25	1900646	COVER-WORM
			1		24	1900645	SHIM, LAMINATED
			1		23	1900644	BRACKET, WORM
			1		22	1900643	SHAFT, WORM, FINE ADJUST
			1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
			1		20	1900641	WASHER, THRUST
			1		19	1900640	GEAR-WORM R.H.
			1		18	1900639	SHAFT, COARSE ADJUST
					17		
			1		16	1900637	SHAFT, GEAR
			1		15	1900636	POINTER-INDEX
			1		14	1900635	GEAR-OUTPUT
			1		13	1900634	CAP, BEARING
			1		12	1900633	CAP, BEARING
			2		11	1900725	LEVER, SHAFT LOCK
			1		10	1900631	WASHER, THRUST
			1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
			1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
			1		7	1900629	LOCK-SHAFT (L.H.)
			1		6	1900628	LOCK-SHAFT (R.H.)
			1		5	1900627	RETAINER, BEARING
			1		4	1900626	RETAINER, BEARING
			2		3	1900625	CARTRIDGE, BEARING
			1		2	1900622	RING-BASE
			1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

LIST OF PARTS AND MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED 16 SEP 63
APPROVAL 17 SEP 63
APPROVAL 10/21/63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO.
SIZE J3
1900014
SCALE 1:4
SHEET 1 OF 2

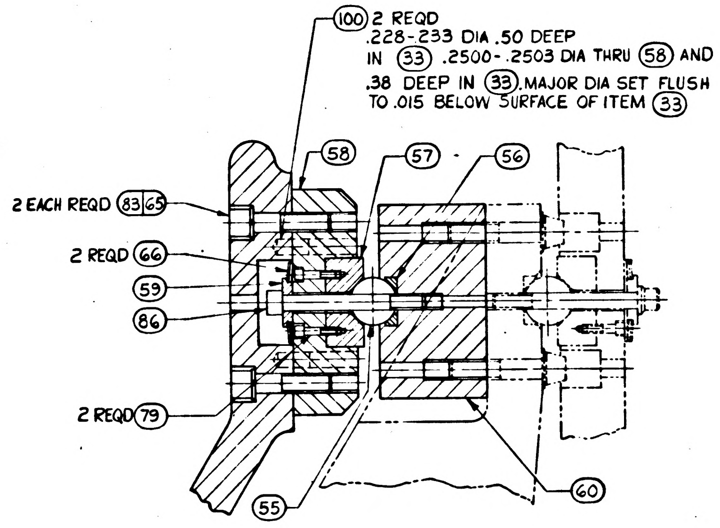
3

1900014
H

1900014 SH 1

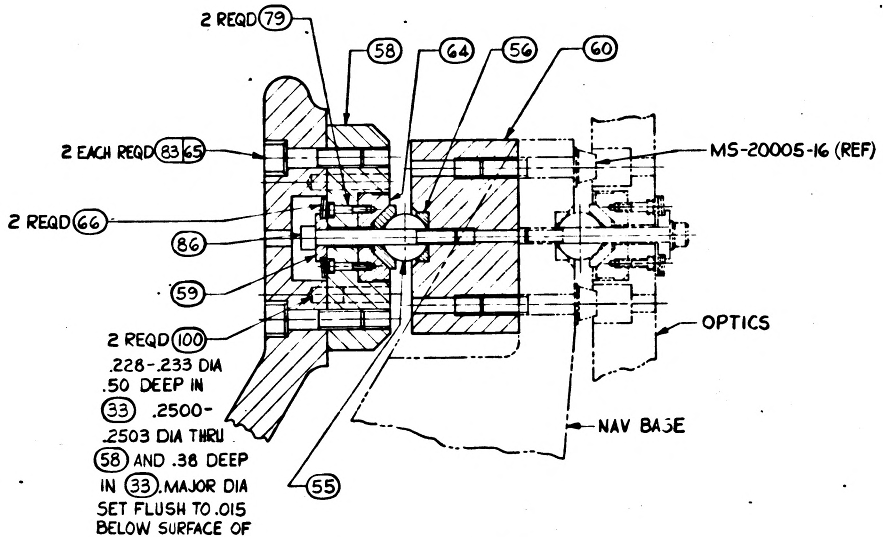
2 EACH REQD

REQD



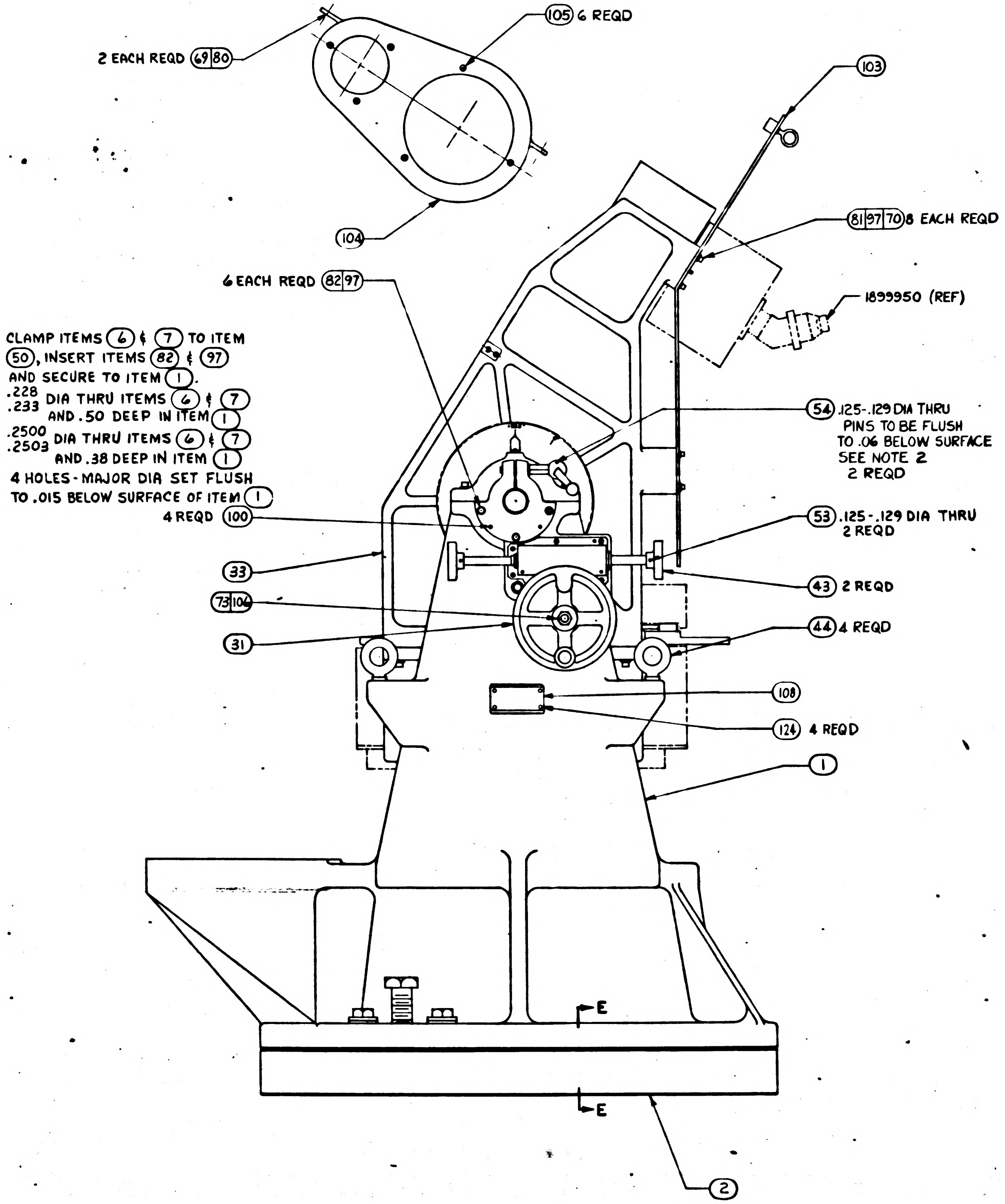
(100) 2 REQD .228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (58) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
(58)
(57)
(56)
2 EACH REQD (83)(65)
2 REQD (66)
(59)
(86)
2 REQD (79)
(55)
(60)

PARTIAL SECTION A-A
FULL SCALE

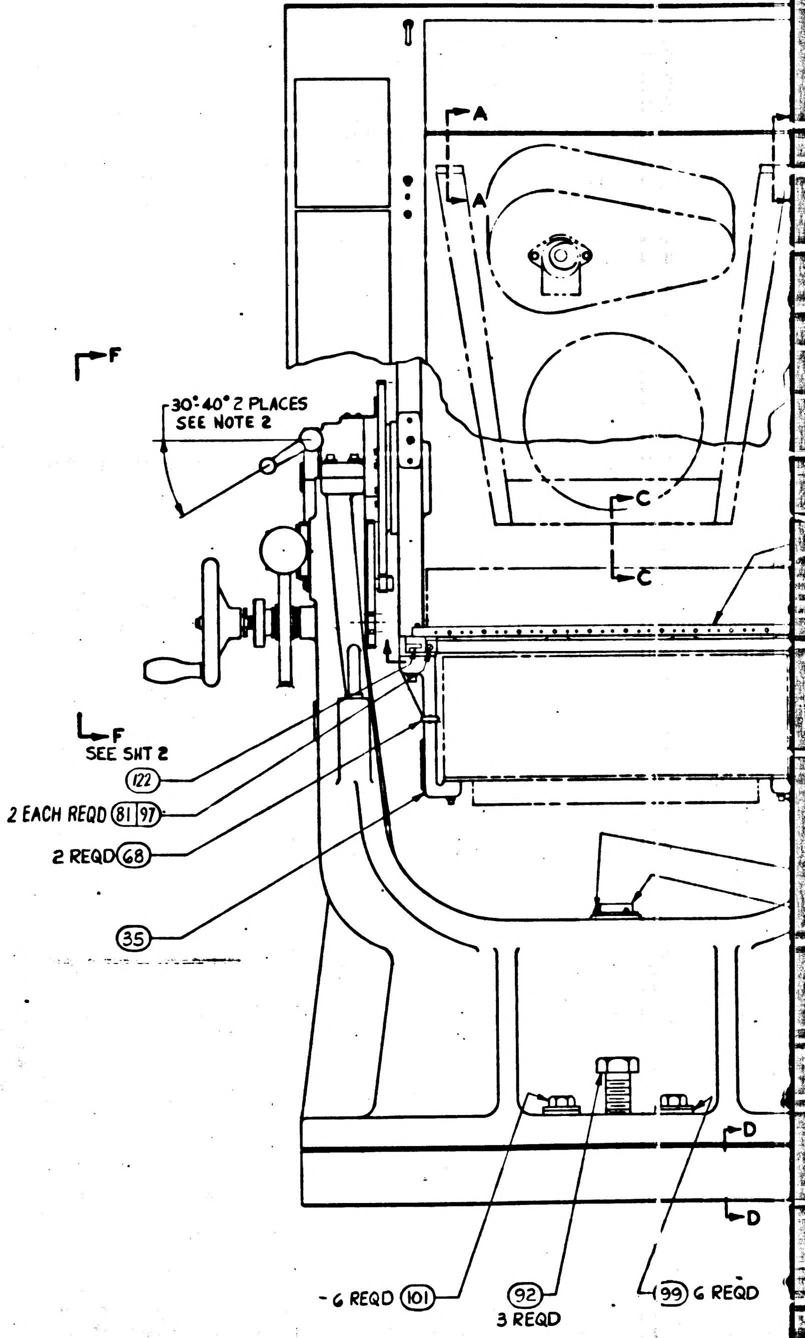


2 REQD (79)
(58)
(64)
(56)
(60)
2 EACH REQD (83)(65)
MS-20005-16 (REF)
2 REQD (66)
(86)
(59)
OPTICS
2 REQD (100) .228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (58) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
NAV BASE
(55)

PARTIAL SECTION B-B
FULL SCALE

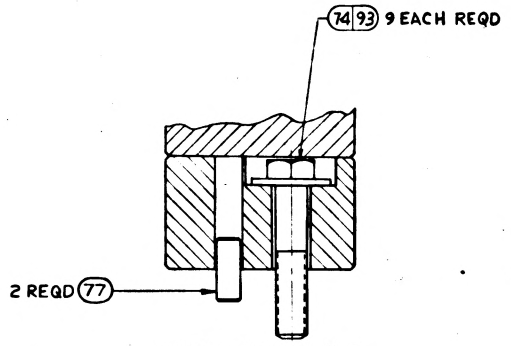


(105) 6 REQD
2 EACH REQD (69)(80)
(103)
(104)
(81)(97)(70) 8 EACH REQD
6 EACH REQD (82)(97)
1899950 (REF)
CLAMP ITEMS (6) & (7) TO ITEM (50), INSERT ITEMS (82) & (97) AND SECURE TO ITEM (1). .228 .233 DIA THRU ITEMS (6) & (7) AND .50 DEEP IN ITEM (1) .2500 .2503 DIA THRU ITEMS (6) & (7) AND .38 DEEP IN ITEM (1) 4 HOLES - MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (1)
4 REQD (100)
(54) .125-.129 DIA THRU PINS TO BE FLUSH TO .06 BELOW SURFACE SEE NOTE 2 2 REQD
(53) .125-.129 DIA THRU 2 REQD
(33)
(43) 2 REQD
(73)(106)
(44) 4 REQD
(31)
(108)
(124) 4 REQD
(1)
E
E
(2)

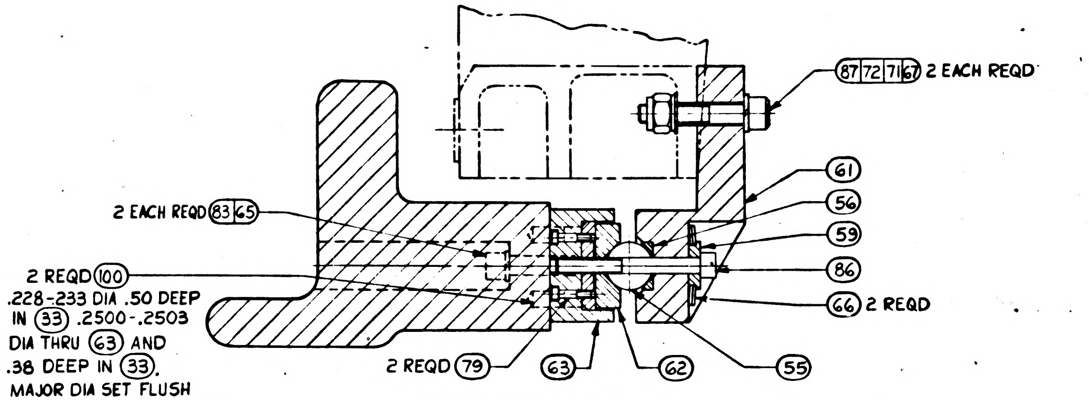


A
A
F
30°-40° 2 PLACES SEE NOTE 2
C
C
F
SEE SHT 2
(122)
2 EACH REQD (81)(97)
2 REQD (68)
(35)
D
D
6 REQD (101)
(92) 3 REQD
(99) 6 REQD

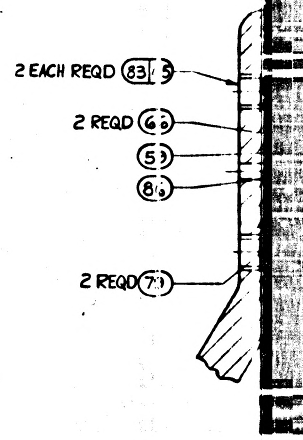
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. PIN (11) TO (8) OR (9) AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

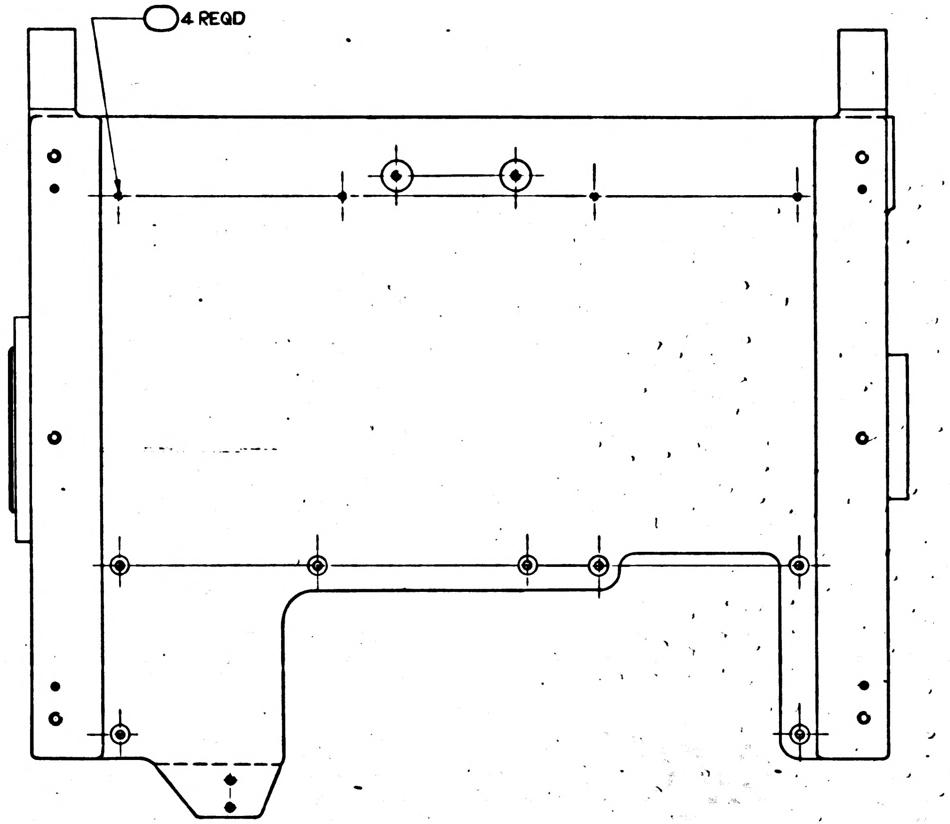

(74|93) 9 EACH REQD
2 REQD (77)

PARTIAL SECTION D-D
SCALE 1:2

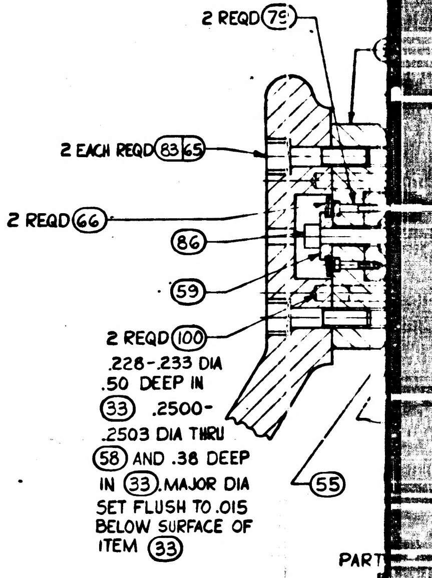

(87|72|71|67) 2 EACH REQD
2 EACH REQD (83|65)
(61)
(56)
(59)
(86)
(66) 2 REQD
2 REQD (100)
.228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (63) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
2 REQD (79)
(63)
(62)
(55)

PARTIAL SECTION C-C
FULL SCALE

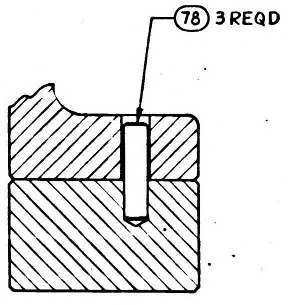

2 EACH REQD (83|65)
2 REQD (66)
(59)
(86)
2 REQD (79)



VIEW G-G
SCALE 1:2


2 REQD (79)
2 EACH REQD (83|65)
2 REQD (66)
(86)
(59)
2 REQD (100)
.228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (58) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
(55)

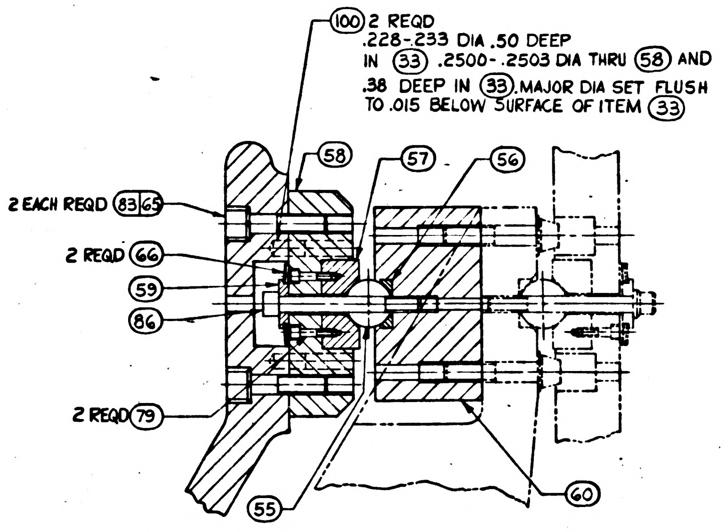
PART



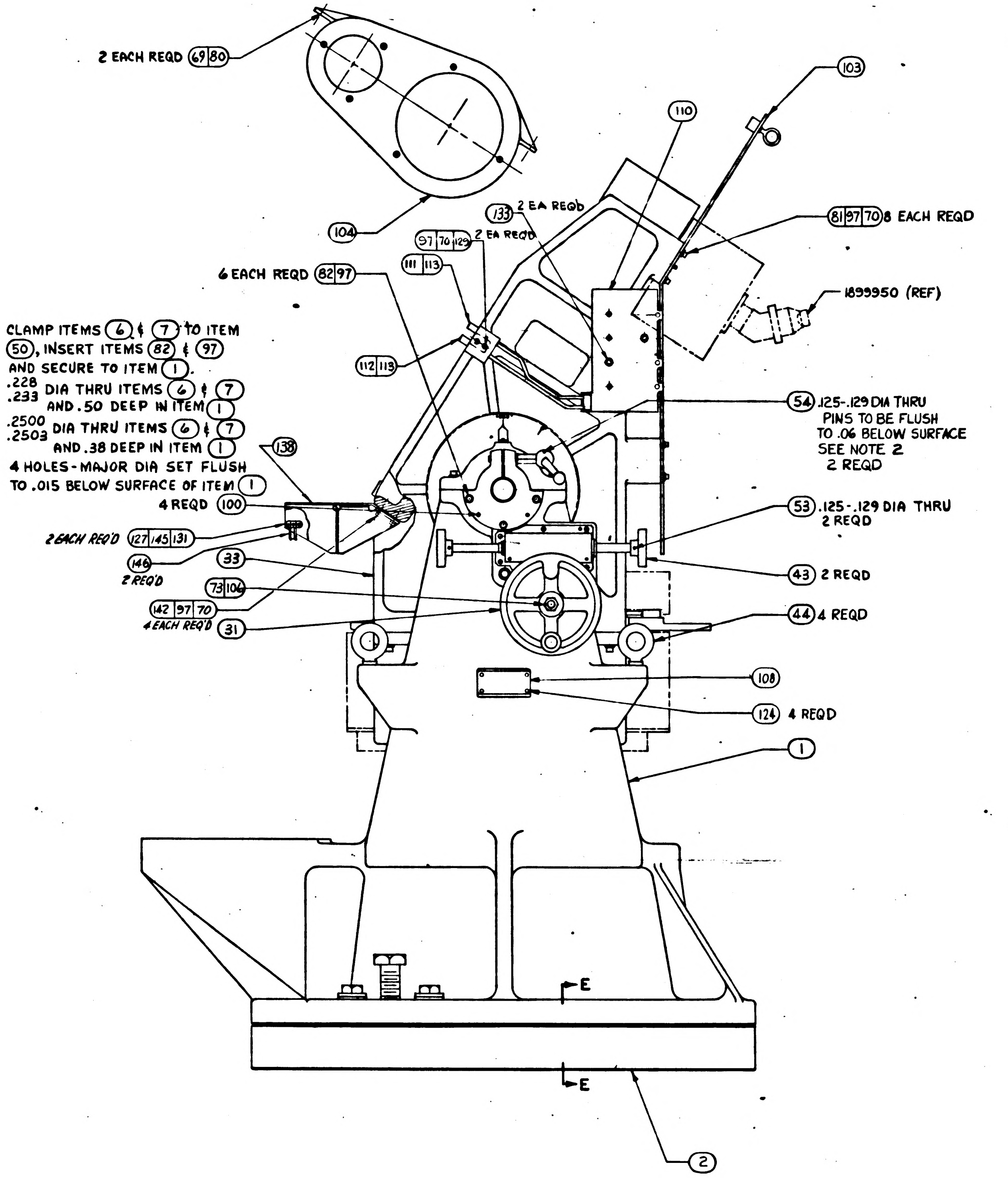
PARTIAL SECTION E-E
SCALE 1:2

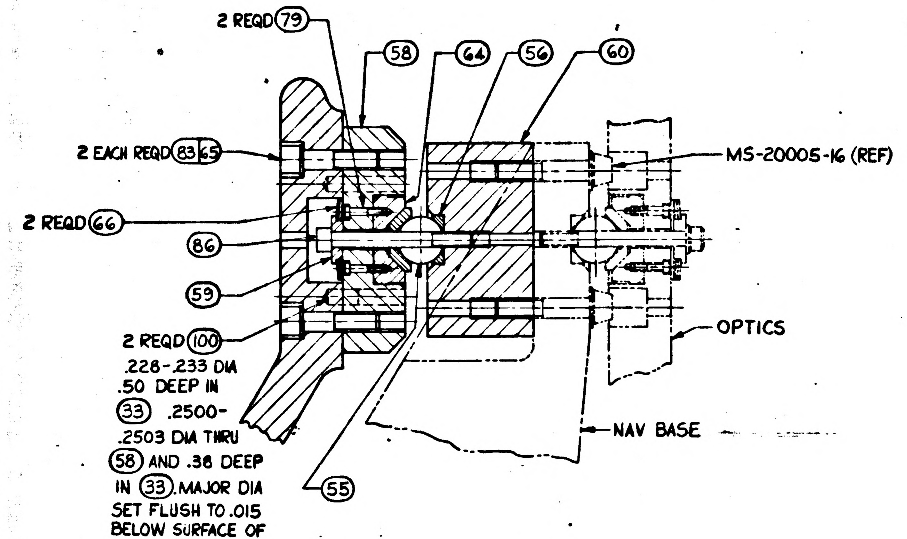
MIL FORM 1050 J3

1 | 1900014 | SH 1

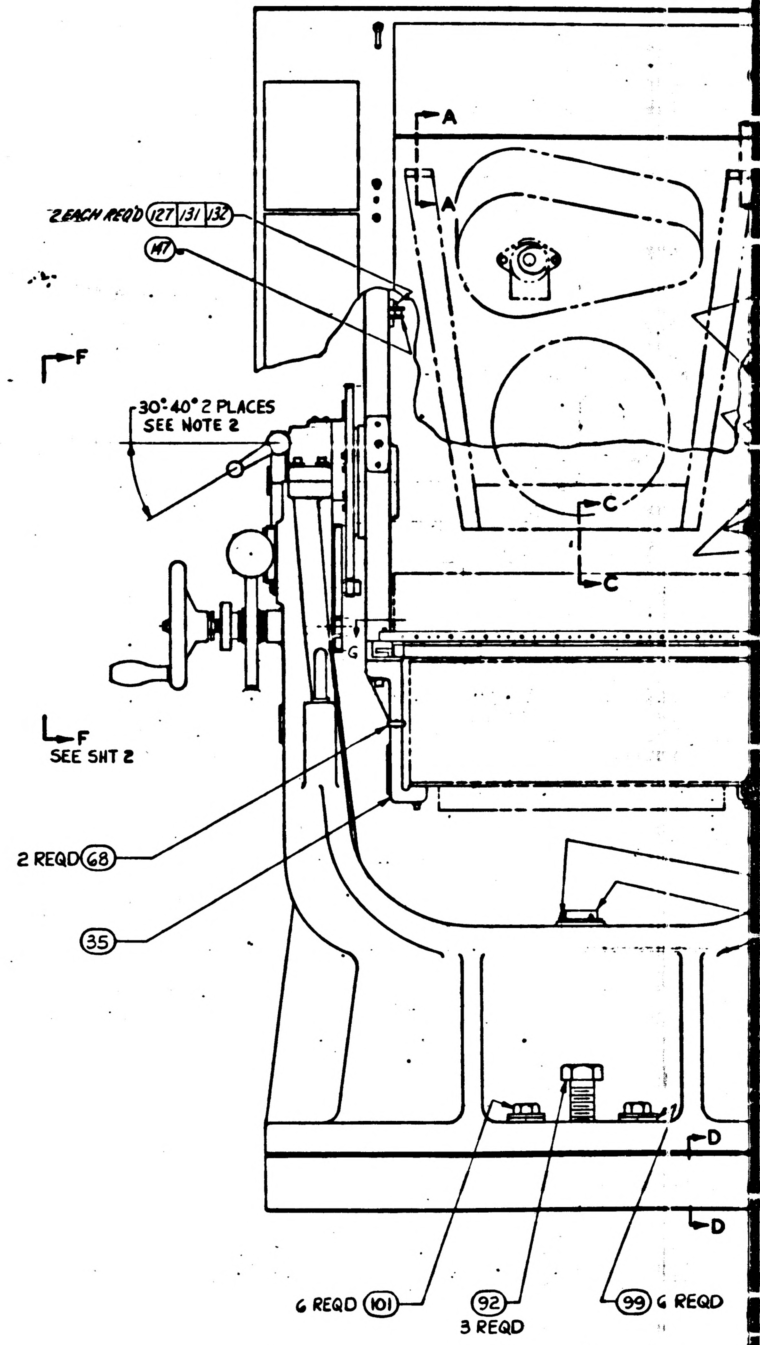

(100) 2 REQD
.228-.233 DIA .50 DEEP
IN (33) .2500-.2503 DIA THRU (58) AND
.38 DEEP IN (33). MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (33)
(58)
(57)
(56)
2 EACH REQD (83)(65)
2 REQD (66)
(59)
(86)
2 REQD (79)
(55)
(60)

PARTIAL SECTION A-A
FULL SCALE


2 EACH REQD (69)(80)
(103)
(110)
(104)
(133) 2 EA REQD
(97)(70)(129) 2 EA REQD
(111)(113)
(81)(97)(70) 8 EACH REQD
6 EACH REQD (82)(97)
1899950 (REF)
(112)(113)
CLAMP ITEMS (6) & (7) TO ITEM
(50), INSERT ITEMS (82) & (97)
AND SECURE TO ITEM (1).
.228
.233 DIA THRU ITEMS (6) & (7)
AND .50 DEEP IN ITEM (1)
.2500
.2503 DIA THRU ITEMS (6) & (7)
AND .38 DEEP IN ITEM (1)
4 HOLES-MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (1)
(138)
4 REQD (100)
(54) .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
(53) .125-.129 DIA THRU
2 REQD
2 EACH REQ'D (127)(145)(131)
(146)
2 REQ'D
(33)
(73)(106)
(142)(97)(70)
4 EACH REQ'D (31)
(43) 2 REQD
(44) 4 REQD
(108)
(124) 4 REQD
(1)
E
E
(2)


2 REQD (79)
(58)
(64)
(56)
(60)
2 EACH REQD (83)(65)
MS-20005-16 (REF)
2 REQD (66)
(86)
(59)
2 REQD (100)
.228-.233 DIA
.50 DEEP IN
(33) .2500-
.2503 DIA THRU
(58) AND .38 DEEP
IN (33). MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM (33)
(55)
OPTICS
NAV BASE

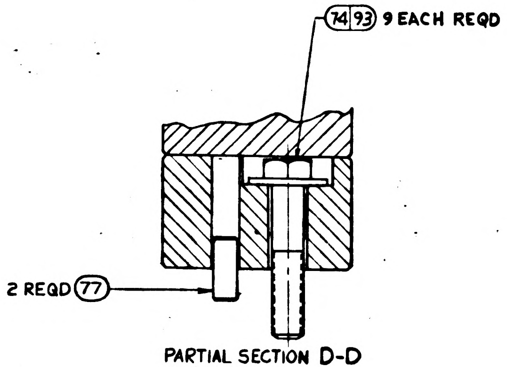
PARTIAL SECTION B-B
FULL SCALE


A
A
2 EACH REQ'D (127)(131)(132)
(147)
F
30°-40° 2 PLACES
SEE NOTE 2
C
C
G
F
SEE SHT 2
2 REQD (68)
(35)
D
D
6 REQD (101)
(92)
3 REQD
(99) 6 REQD

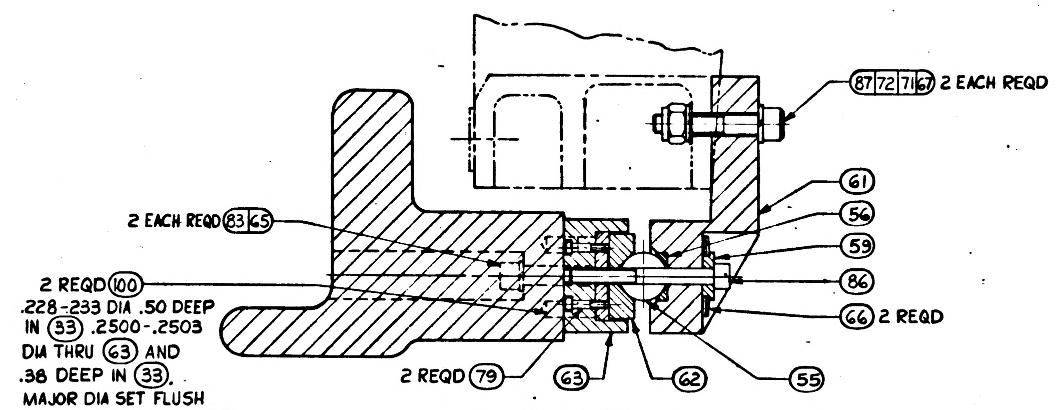
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. PIN (11) TO (8) OR (9) AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING
4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

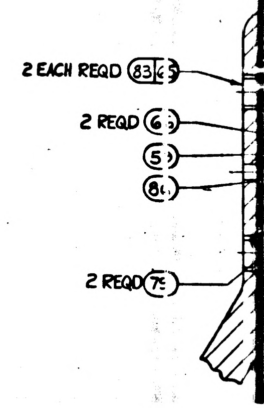
QUAN.	ITEM NO
6	69
6	71
6	102
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144

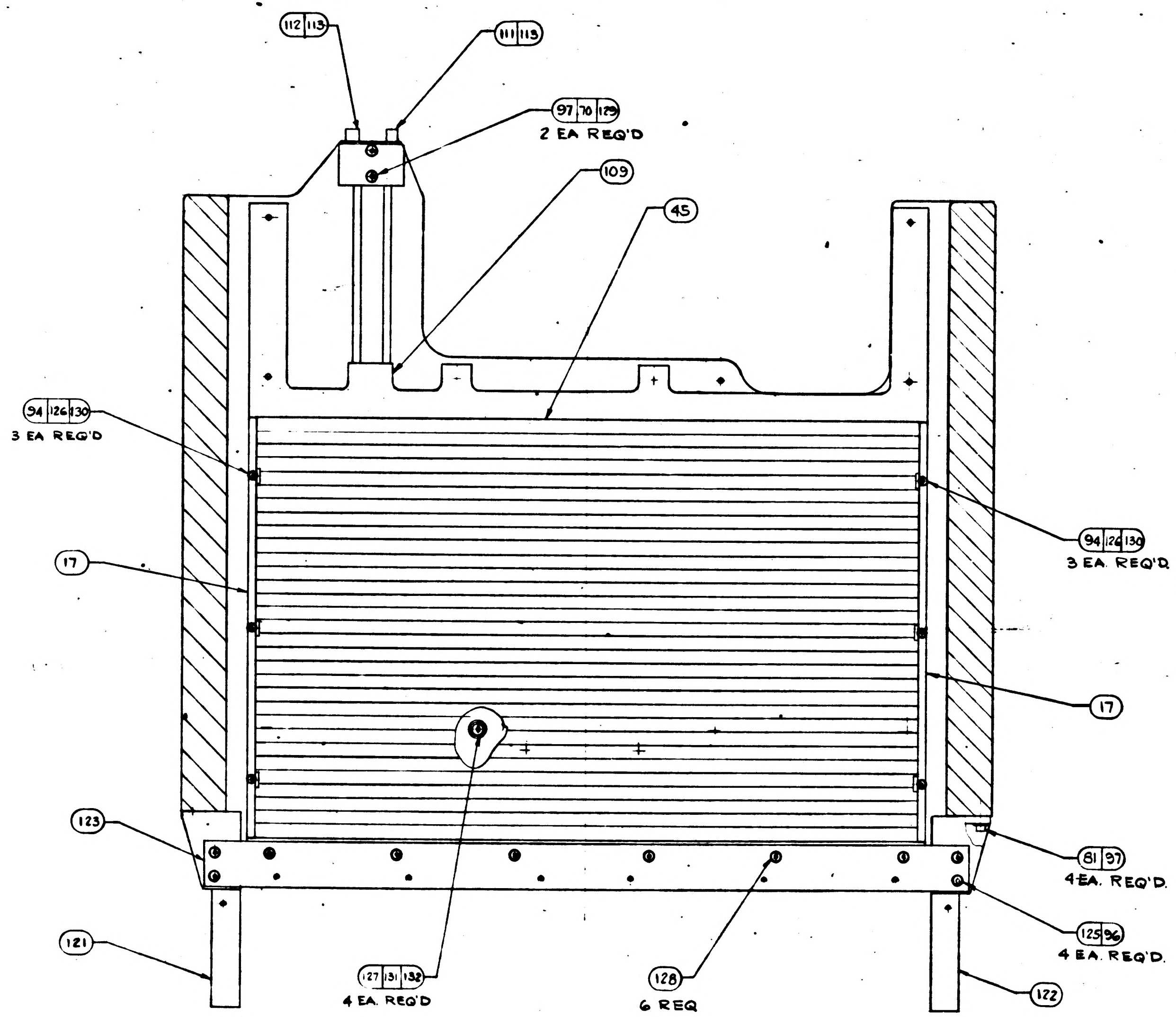

74 93 9 EACH REQD
2 REQD 77

PARTIAL SECTION D-D
SCALE 1:2

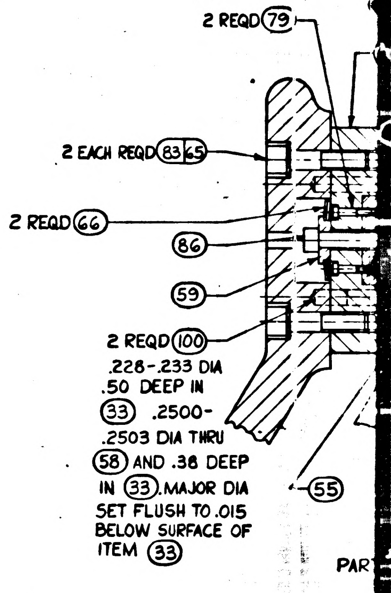

87 72 71 67 2 EACH REQD
2 EACH REQD 83 65
61
56
59
86
66 2 REQD
2 REQD 100
.228-233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 63 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
2 REQD 79
63
62
55

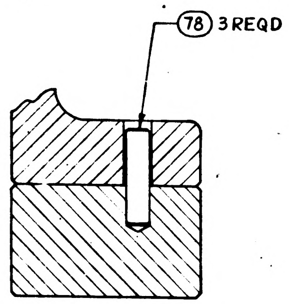
PARTIAL SECTION C-C
FULL SCALE


2 EACH REQD 83 65
2 REQD 6
5
8
2 REQD 79

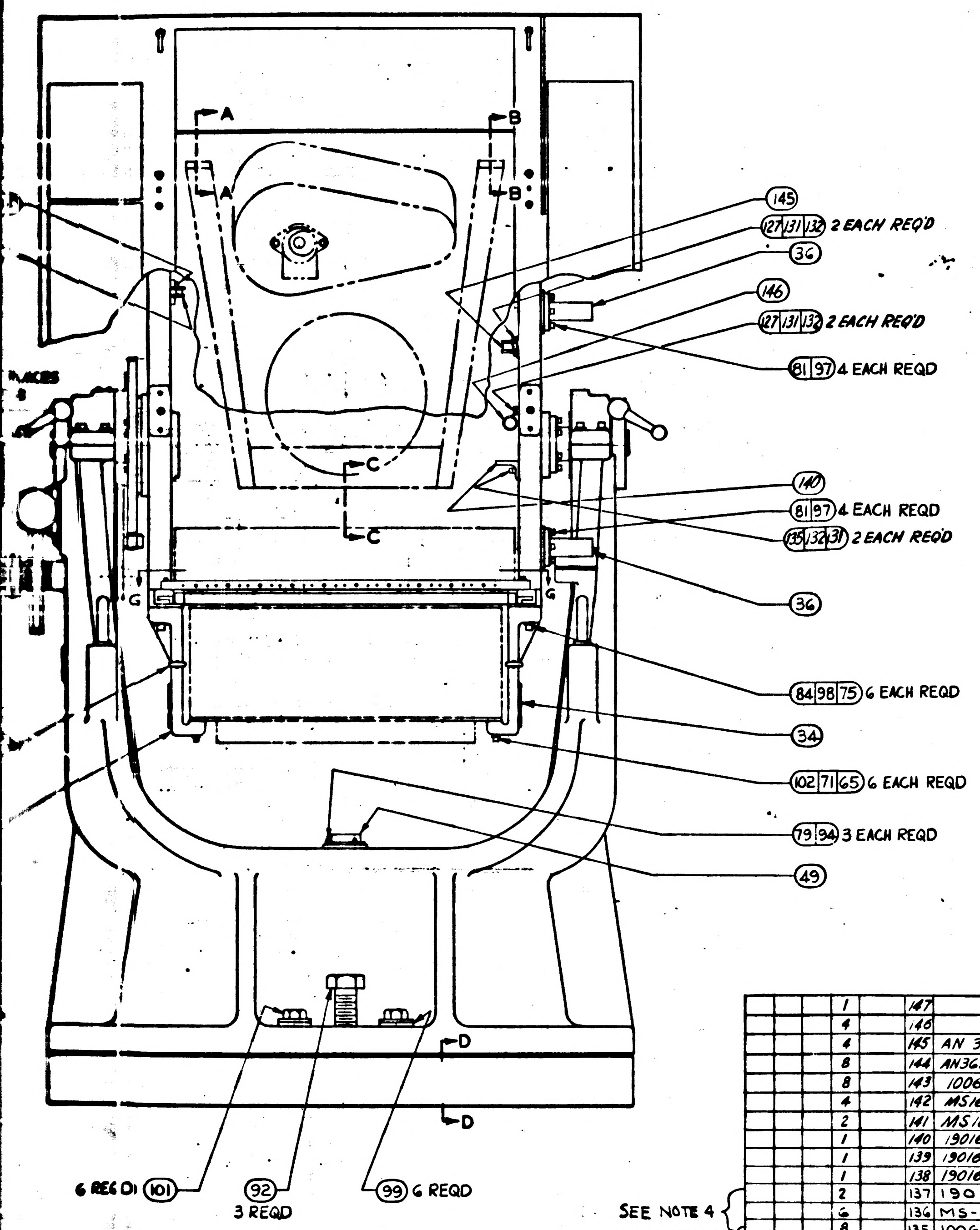

112 113
111 113
97 70 129
2 EA REQ'D
109
45
94 126 130
3 EA REQ'D
17
94 126 130
3 EA. REQ'D
17
123
81 97
4 EA. REQ'D.
125 96
4 EA. REQ'D.
121
127 131 132
4 EA. REQ'D
128
6 REQ
122

VIEW G-G
(SCALE 1:2)


2 REQD 79
2 EACH REQD 83 65
2 REQD 66
86
59
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 58 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
55
PAR



PARTIAL SECTION E-E
SCALE 1:2



	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1		147		CLAMP-LOOP HINGED
				4		146		CLAMP-LOOP HINGED
				4		145	AN 363C832	(1896990-281) NUT-SELF LOCKING
				8		144	AN363C632	(1896990-261) NUT-SELF LOCKING
				8		143	1006783-23	SCREW-BUTTON HD HEX SOC.
				4		142	MS16995-50	SCREW-CAP
				2		141	MS16995-28	SCREW-CAP
				1		140	1901650	BRACKET-CONN., ELEC
				1		139	1901643	GUARD-HARNESS
				1		138	1901639	BRACKET-CONN., ELEC.
SEE NOTE 4				2		137	1901594	SCREW-SHOULDER
SEE NOTE 4				6		136	MS-16996-16	SCREW-CAP
SEE NOTE 3				8		135	1006783-29	SCREW-BUTTON HD. HEX. SOC.
SEE NOTE 3								

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				2		133	1015831-249	SCREW-FLAT HD. HEX SOC
				14		132	MS-35338-80	WASHER-LOCK
SEE NOTE 4				24		131	AN 960-C-8L	(1897006-038) WASHER FLAT
				8		130	AN 960-C-4	(1897006-024) WASHER FLAT
				4		129	MS-16995-55	SCREW-CAP
SEE NOTE 3				6		128	1015826-296	SCREW-FL. HD.
SEE NOTE 3				14		127	1006783-27	SCREW-BUTTON HD
SEE NOTE 3				8		126	1006783-20	SCREW, BUTTON HD.
				4		125	MS-16996-14	SCREW-CAP SOC. HD.
				4		124	AN 535-0-4	SCREW-DRIVE
				1		123	1900874	CAP-TOE, GSE, PSA.
				1		122	1901348	BRACKET-SUPPORT R.H.
				1		121	1901347	BRACKET-SUPPORT L.H.
				1		120	1900939	PINION-CHANGE GEAR
				1		119	1900938	WASHER
				1		118	1900937	WASHER-STEP
				1		117	1900936	SPACER
				1		116	MS-16624-4075	RING-RETAINING
				1		115	1900940.	BUSHING-COMPOUND
				1		114	1900935	WASHER-FLAT
SEE NOTE 3				4		113	1000159-6	PACKING, PREFORMED O-RING
SEE NOTE 3				2		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
SEE NOTE 3				2		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
				1		110	1900850	COLDPLATE, CDU (INSEP. ASS'Y)
				1		109	1900819	COLDPLATE, PSA, (INSEP. ASS'Y)
				1		108	1901304-211	PLATE, IDENTIFICATION
				12		107	AN960C6L	(1897006-036 WASHER-FLAT
				1		106	NAS 1408C8	(1896868-108) NUT-SELF LOCKING
SEE NOTE 4				6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
				1		104	1900590	GUARD AND SEAL ASSY
				1		103	1900552	RACK
SEE NOTE 4				12		102	MS-16995-68	SCREW, HEX SOC
				6		101	MS35305-240	SCREW, CAP
SEE NOTE 3				14		100	1016093-001	PIN-STEP DOWEL
SEE NOTE 3				6		99	1016095-007	WASHER-SPHERICAL
				6		98	MS35338-84	WASHER-LOCK, SPLIT
				59		97	MS35338-82	WASHER-LOCK, SPLIT
				30		96	MS35338-81	WASHER-LOCK, SPLIT
				4		95	MS35338-79	WASHER-LOCK, SPLIT
				11		94	MS35338-78	WASHER-LOCK, SPLIT
				9		93	MS35305-242	SCREW, CAP
				3		92	MS35300-316	SCREW, CAP
				4		91	MS35216-25	SCREW, MACHINE, PAN HD
				1		90	MS24692-162	PIN-TAPER
				1		89	MS24692-189	PIN-TAPER
				2		88	MS24692-108	PIN-TAPER
				2		87	MS16998-62	SCREW-HEX SOC
				3		86	MS16998-50	SCREW-HEX SOC
				24		85	MS16996-12	SCREW, CAP
				6		84	MS16995-84	SCREW, CAP
				6		83	MS16995-67	SCREW, CAP
				24		82	MS16995-53	SCREW, CAP
				27		81	MS16995-52	SCREW, CAP
				4		80	MS16995-37	SCREW, CAP
				9		79	MS16995-11	SCREW, CAP
				3		78	MS16556-104	PIN-STRAIGHT
				2		77	MS16556-101	PIN-STRAIGHT
				4		76	MS16555-648	PIN-STRAIGHT
				6		75	MS15795-315	WASHER, FLAT
				9		74	MS15795-126	WASHER, FLAT
				3		73	AN960C816	(1897006-082) WASHER-FLAT
				2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
SEE NOTE 4				14		71	AN960C516	(1897006-052) WASHER-FLAT
				16		70	AN960C416	(1897006-042) WASHER-FLAT
SEE NOTE 4				10		69	AN960C10	(1897006-017) WASHER-FLAT
SEE NOTE 3				2		68	1015916-001	BOLT-EYE
				2		67	NAS70V328-563	WASHER-FIBRE
				6		66	1899979	WASHER-BELLEVILLE
				12		65	MS-35338-83	WASHER-LOCK
				1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
				1		63	1900581	PAD
				1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
				1		61	1900580	MOUNT-BALL
				2		60	1900583	SPACER-BALL MOUNT
				3		59	1900962	COLLAR-CENTERING
				2		58	1900582	PAD
				1		57	1900968	INSERT-BALL MOUNT. STAT.
				3		56	1900972	INSERT
				3		55	1900963	BALL-PRECISION
				2		54	MS-171537	PIN-SPRING
				2		53	MS-171536	PIN-SPRING
				1		52	MS-24585-C499	(1897067-499) SPRING
				1		51	MS171600	PIN, SPRING
				2		50	1900624	SHAFT-TRUNNION
SEE NOTE 3				1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
				1		48	MS-16624-4075	RING, RETAINING
				2		47	1901622-002	BEARING-THRUST
				1		46	MS-17796-112	BEARING-SLEEVE
				1		45	1901369	PAD, THERMAL INTERFACE
SEE NOTE 3				4		44	1015916-003	BOLT-EYE
				2		43	1900632	KNOB, FINE ADJUST
				~~1~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
				1		41	MS-17796-89	BEARING, SLEEVE
				~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2		39	MS-172211	WASHER, KEY, BEARING RETAINING
			2		38	MS-172246	NUT, SPANNER
			2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
			2		36	1900571	SHAFT, STOP
			1		35	1900716	BRACKET, MOUNTING (L.H.)
			1		34	1900715	BRACKET, MOUNTING (R.H.)
			1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
			1		32	1900776	WORM R.H.
			1		31	1900724	HANDWHEEL
			1		30	1900723	WASHER
			1		29	1900722	GEAR, INTERMEDIATE
			1		28	1900721	GUIDE, SPRING
			1		27	1900720	WASHER, SPRING
			1		26	1900647	PINION
			1		25	1900646	COVER-WORM
			1		24	1900645	SHIM, LAMINATED
			1		23	1900644	BRACKET, WORM
			1		22	1900643	SHAFT, WORM, FINE ADJUST
			1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
			1		20	1900641	WASHER, THRUST
			1		19	1900640	GEAR-WORM R.H.
			1		18	1900639	SHAFT, COARSE ADJUST
			2		17	1901370	CLAMP, THERMAL INTERFACE MATL
			1		16	1900637	SHAFT, GEAR
			1		15	1900636	POINTER-INDEX
			1		14	1900635	GEAR-OUTPUT
			1		13	1900634	CAP, BEARING
			1		12	1900633	CAP, BEARING
			2		11	1900725	LEVER, SHAFT LOCK
			1		10	1900631	WASHER, THRUST
			1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
			1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
			1		7	1900629	LOCK-SHAFT (L.H.)
			1		6	1900628	LOCK-SHAFT (R.H.)
			1		5	1900627	RETAINER, BEARING
			1		4	1900626	RETAINER, BEARING
			2		3	1900625	CARTRIDGE, BEARING
			1		2	1900622	RING-BASE
			1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

LIST OF PARTS AND MATERIALS

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 04095	—	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN -64	X.F.W. MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDRR 07455		13 JAN -63	MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 TDRR 07456		13 JAN 64	JJ MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 TDRR 07457		3 FEB 64	X.F.W. MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR [illegible]58		26 FEB 64	W.D.
J		CHANGE IN ACCORDANCE WITH CM 196276 TDRR 09224		23 APR 64	J.C PJ
K		CHANGE IN ACCORDANCE WITH CM-196929 TDRR [illegible]		13 MAY 64	BK MEM

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 DATE

Ⓒ REPLACES REV "B" WITH CHANGE

SHEET 1	SHEET 2
K	K
J	J

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2
H	E
G	E
F	E
E	E
D	C
C	C

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED R. Long 16 SEP 63
APPROVAL L. C. Harmon 17 SEP 63
APPROVAL J. Gilman 10/21/63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

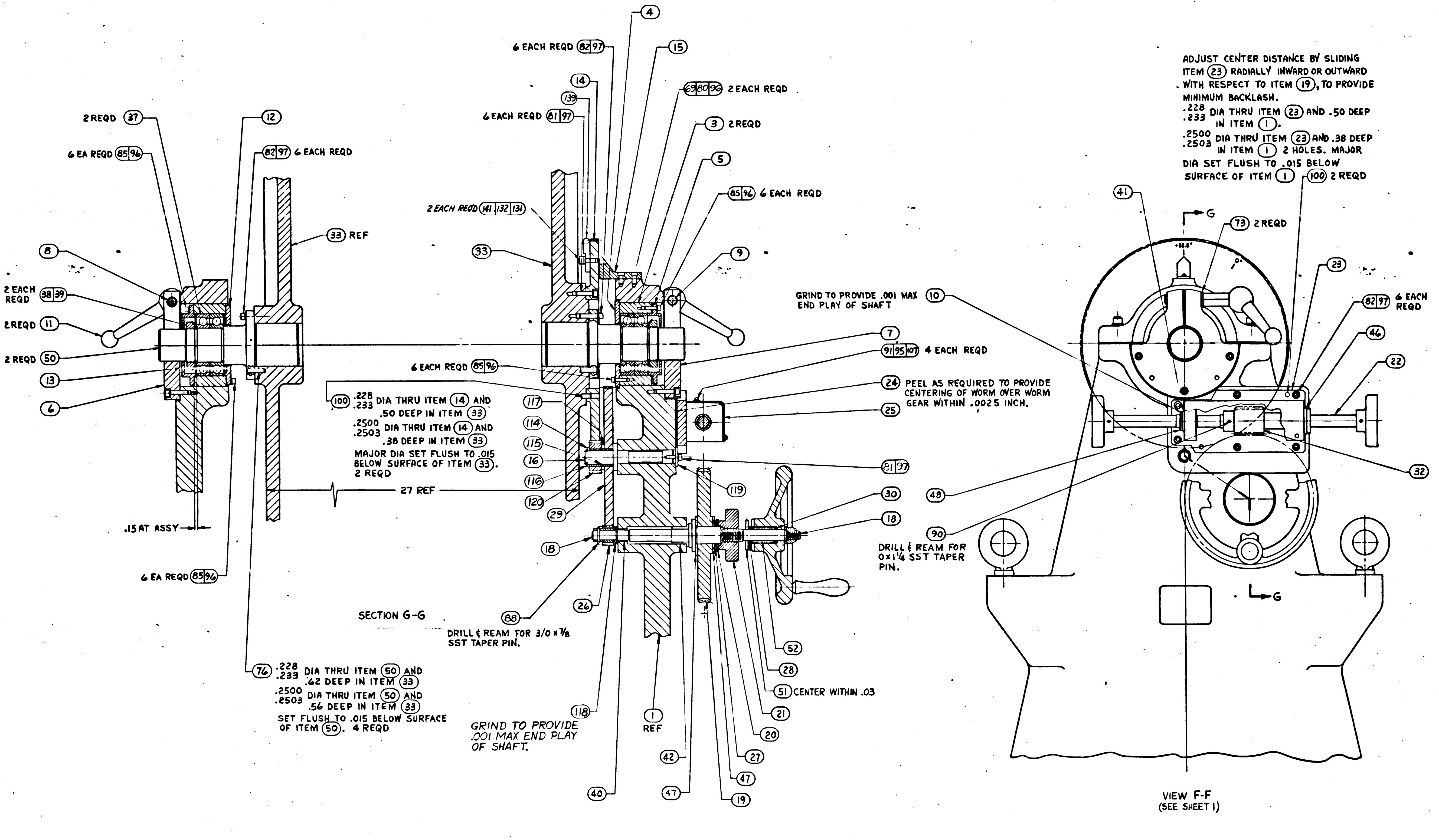
G & N MOUNTING FIXTURE ASSEMBLY.

CODE IDENT NO.
SIZE J3
1900014
SCALE 1:4
SHEET 1 OF 2

1900014 SH 1

3/1900014

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C	-	THIS SHEET ADDED PER MXC-190286. PER TDRR 04095		24 SEP 63	RJM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDRR 07455		13 JAN 63	MEM
J		CHANGE IN ACCORDANCE WITH CM 196276 TDRR 09224		17 APR 64	J.C
K		CHANGE IN ACCORDANCE WITH CM-196929 TDRR		8 MAY 64	BK MEM



2 REQD 37
6 EA REQD 85 96
12
82 97 6 EACH REQD
33 REF
8
2 EACH REQD 38 39
2 REQD 11
2 REQD 50
13
6
.15 AT ASSY
6 EA REQD 85 96
27 REF
4
6 EACH REQD 82 97
15
14
139
69 80 96 2 EACH REQD
6 EACH REQD 81 97
3 2 REQD
5
85 96 6 EACH REQD
2 EACH REQD 141 132 131
33
9
7
91 95 107 4 EACH REQD
6 EACH REQD 85 96
117
114
115
16
116
120
29
25
81 97
119
30
18
18
88
26
52
28
51 CENTER WITHIN .03
21
20
27
47
19
47
42
40
118
1 REF
10
41
G
73 2 REQD
+52.5°
0°
23
82 97 6 EACH REQD
46
22
32
48
90
G

SECTION G-G

VIEW F-F
(SEE SHEET 1)

(100) .228/.233 DIA THRU ITEM (14) AND .50 DEEP IN ITEM (33)
.2500/.2503 DIA THRU ITEM (14) AND .38 DEEP IN ITEM (33)
MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33).
2 REQD

(76) .228/.233 DIA THRU ITEM (50) AND .62 DEEP IN ITEM (33)
.2500/.2503 DIA THRU ITEM (50) AND .56 DEEP IN ITEM (33)
SET FLUSH TO .015 BELOW SURFACE OF ITEM (50). 4 REQD

(88) DRILL & REAM FOR 3/0 x 7/8 SST TAPER PIN.

(118) *GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT.*

(10) GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT

(24) PEEL AS REQUIRED TO PROVIDE CENTERING OF WORM OVER WORM GEAR WITHIN .0025 INCH.

(90) DRILL & REAM FOR 0 x 1¼ SST TAPER PIN.

ADJUST CENTER DISTANCE BY SLIDING ITEM (23) RADIALLY INWARD OR OUTWARD WITH RESPECT TO ITEM (19), TO PROVIDE MINIMUM BACKLASH.
.228/.233 DIA THRU ITEM (23) AND .50 DEEP IN ITEM (1).
.2500/.2503 DIA THRU ITEM (23) AND .38 DEEP IN ITEM (1) 2 HOLES. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (1) (100) 2 REQD

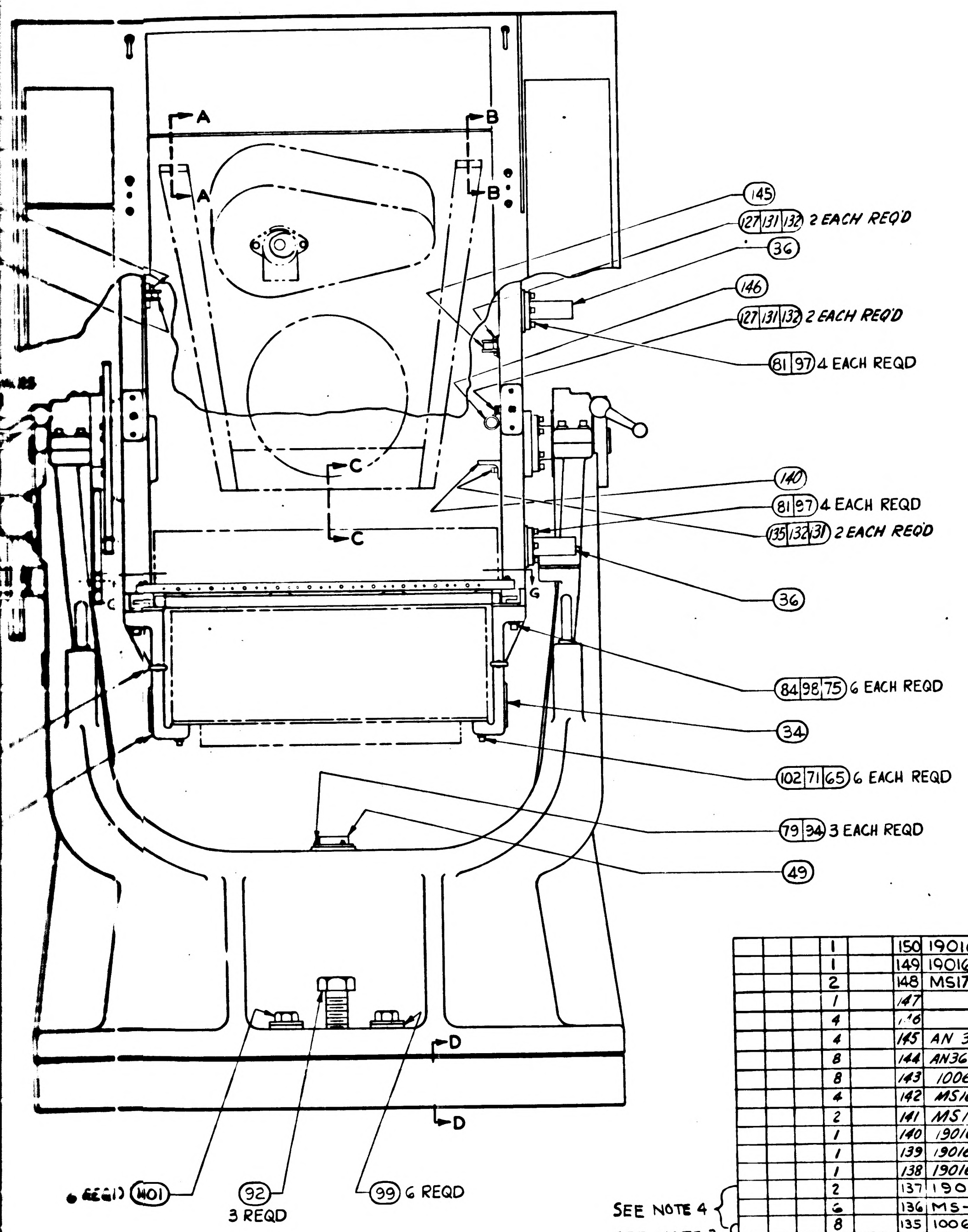
FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 02788 DATE 11-14-63

ⒸTHIS SHEET ADDED

1900030-011	1900030-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ±.005 ±.02 ANGLES ± — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN Schwabe DATE 19 MAR 63 CHECKED C. Bary 16 SEP '63 APPROVAL 17 SEP '63 APPROVAL L Gilman 10/24/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	G & N MOUNTING FIXTURE ASSEMBLY
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL	CODE IDENT NO	SIZE E · 1900014
APPLICATION		CONTRACT NAS 9-497	MIT APPROVAL	SCALE 1:2	SHEET 2 OF 2

1900014 K

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 0404	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN 64	K.F.H. MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDR 07455		13 JAN 63	MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 TDR 07456		13 JAN 64	JJ MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 TDR 0745		3 FEB 64	K.F.H. MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR		26 FEB 64	W.G.
J		CHANGE IN ACCORDANCE WITH CM 196276 09224		23 APR 64	J.C.
K		CHANGE IN ACCORDANCE WITH CM-196929 09225		13 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CM 197337 10823		22 MAY 64	EM



	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1		150	1901667-001	WASHER, THRUST
				1		149	1901668-001	WASHER, THRUST
				2		148	MS171493	PIN, ROLL
				1		147		CLAMP-LOOP HINGED
				4		146		CLAMP-LOOP HINGED
				4		145	AN 363C832	(1896990-281) NUT-SELF LOCKING
				8		144	AN363C632	(1896990-261) NUT-SELF LOCKING
				8		143	1006783-23	SCREW-BUTTON HD HEX SOC.
				4		142	MS16995-50	SCREW-CAP
				2		141	MS16995-28	SCREW-CAP
				1		140	1901650	BRACKET-CONN., ELEC
				1		139	1901643	GUARD-HARNESS
				1		138	1901639	BRACKET-CONN., ELEC.
SEE NOTE 4				2		137	1901594	SCREW-SHOULDER
				6		136	MS-16996-16	SCREW-CAP
SEE NOTE 3				8		135	1006783-29	SCREW-BUTTON HD. HEX. SOC.

LIST OF PARTS AND MATERIALS

L	L
K	K
J	J
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

H	E
G	E
F	E
E	E
D	C
C	C
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				2		133	1015831-249	SCREW-FLAT HD. HEX SOC
				14		132	MS-35338-80	WASHER-LOCK
SEE NOTE 4				24		131	AN 960-C-8L	(1897006-038) WASHER FLAT
				8		130	AN 960-C-4	(1897006-024) WASHER FLAT
				4		129	MS-16995-55	SCREW-CAP
				6		128	1015826-296	SCREW-FL.HD.
SEE NOTE 3				14		127	1006783-27	SCREW-BUTTON HD
				8		126	1006783-20	SCREW, BUTTON HD.
				4		125	MS-16996-14	SCREW-CAP SOC. HD.
				4		124	AN 535-0-4	SCREW-DRIVE
				1		123	1900874	CAP-TOE, GSE, PSA.
				1		122	1901348	BRACKET-SUPPORT R.H.
				1		121	1901347	BRACKET-SUPPORT L.H.
				1		120	1900939	PINION-CHANGE GEAR
				1		119	1900938	WASHER
				1		118	1900937	WASHER-STEP
				1		117	1900936	SPACER
				1		116	MS-16624-4075	RING-RETAINING
				1		115	1900940	BUSHING-COMPOUND
				1		114	1900935	WASHER-FLAT
				4		113	1000159-6	PACKING, PREFORMED O-RING
SEE NOTE 3				2		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
				2		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
				1		110	1900850	COLDPLATE, CDU (INSEP. ASS'Y)
				1		109	1900819	COLDPLATE, PSA, (INSEP. ASS'Y)
				1		108	1901304-211	PLATE, IDENTIFICATION
				12		107	AN960C6L	(1897006-036 WASHER-FLAT
				1		106	NAS1408C8	(1896868-108) NUT-SELF LOCKING
SEE NOTE 4				6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
				1		104	1900590	GUARD AND SEAL ASSY
				1		103	1900552	RACK
SEE NOTE 4				12		102	MS-16995-68	SCREW, HEX SOC
				6		101	MS35305-240	SCREW, CAP
SEE NOTE 3				14		100	1016093-001	PIN-STEP DOWEL
				6		99	1016095-007	WASHER-SPHERICAL
				6		98	MS35338-84	WASHER-LOCK, SPLIT
				59		97	MS35338-82	WASHER-LOCK, SPLIT
				30		96	MS35338-81	WASHER-LOCK, SPLIT
				4		95	MS35338-79	WASHER-LOCK, SPLIT
				11		94	MS35338-78	WASHER-LOCK, SPLIT
				9		93	MS35305-242	SCREW, CAP
				3		92	MS35300-316	SCREW, CAP
				4		91	MS35216-25	SCREW, MACHINE, PAN HD
				1		90	MS24692-162	PIN-TAPER
				1		89	MS24692-189	PIN-TAPER
				2		88	MS24692-108	PIN-TAPER
				2		87	MS16998-62	SCREW-HEX SOC
				3		86	MS16998-50	SCREW-HEX SOC
				24		85	MS16996-12	SCREW, CAP
				6		84	MS16995-84	SCREW, CAP
				6		83	MS16995-67	SCREW, CAP
				24		82	MS16995-53	SCREW, CAP
				27		81	MS16995-52	SCREW, CAP
				4		80	MS16995-37	SCREW, CAP
				9		79	MS16995-11	SCREW, CAP
				3		78	MS16556-104	PIN-STRAIGHT
				2		77	MS16556-101	PIN-STRAIGHT
				4		76	MS16555-648	PIN-STRAIGHT
				6		75	MS15795-315	WASHER, FLAT
				9		74	MS15795-126	WASHER, FLAT
				3		73	AN960C816	(1897006-082) WASHER-FLAT
				2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
SEE NOTE 4				14		71	AN960C516	(1897006-052) WASHER-FLAT
				16		70	AN960C416	(1897006-042) WASHER-FLAT
SEE NOTE 4				10		69	AN960C10	(1897006-017) WASHER-FLAT
SEE NOTE 3				2		68	1015916-001	BOLT-EYE
				2		67	NAS70V328-563	WASHER-FIBRE
				6		66	1899979	WASHER-BELLEVILLE
				12		65	MS-35338-83	WASHER-LOCK
				1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
				1		63	1900581	PAD
				1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
				1		61	1900580	MOUNT-BALL
				2		60	1900583	SPACER-BALL MOUNT
				3		59	1900962	COLLAR-CENTERING
				2		58	1900582	PAD
				1		57	1900968	INSERT-BALL MOUNT. STAT.
				3		56	1900972	INSERT
				3		55	1900963	BALL-PRECISION
				2		54	MS-171537	PIN-SPRING
				2		53	MS-171536	PIN-SPRING
				1		52	MS-24585-C499	(1897067-499) SPRING
				1		51	MS171600	PIN, SPRING
				2		50	1900624	SHAFT-TRUNNION
SEE NOTE 3				1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
				1		48	MS-16624-4075	RING, RETAINING
				~~2~~		~~47~~	~~1901622-002~~	~~BEARING-THRUST~~
				1		46	MS-17796-112	BEARING-SLEEVE
				1		45	1901369	PAD, THERMAL INTERFACE
SEE NOTE 3				4		44	1015916-003	BOLT-EYE
				2		43	1900632	KNOB, FINE ADJUST
				~~1~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
				1		41	MS-17796-89	BEARING, SLEEVE
				~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0278C DATE

Ⓒ REPLACES REV "B" WITH CHANGE

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2		39	MS-172211	WASHER, KEY, BEARING RETAINING
			2		38	MS-172246	NUT, SPANNER
			2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
			2		36	1900571	SHAFT, STOP
			1		35	1900716	BRACKET, MOUNTING (L.H.)
			1		34	1900715	BRACKET, MOUNTING (R.H.)
			1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
			1		32	1900776	WORM R.H.
			1		31	1900724	HANDWHEEL
			1		30	1900723	WASHER
			1		29	1900722	GEAR, INTERMEDIATE
			1		28	1900721	GUIDE, SPRING
			1		27	1900720	WASHER, SPRING
			1		26	1900647	PINION
			1		25	1900646	COVER-WORM
			1		24	1900645	SHIM, LAMINATED
			1		23	1900644	BRACKET, WORM
			1		22	1900643	SHAFT, WORM, FINE ADJUST
			1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
			1		20	1900641	WASHER, THRUST
			1		19	1900640	GEAR-WORM R.H.
			1		18	1900639	SHAFT, COARSE ADJUST
			2		17	1901370	CLAMP THERMAL INTERFACE MATL
			1		16	1900637	SHAFT, GEAR
			1		15	1900636	POINTER-INDEX
			1		14	1900635	GEAR-OUTPUT
			1		13	1900634	CAP, BEARING
			1		12	1900633	CAP, BEARING
			2		11	1900725	LEVER, SHAFT LOCK
			1		10	1900631	WASHER, THRUST
			1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
			1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
			1		7	1900629	LOCK-SHAFT (L.H.)
			1		6	1900628	LOCK-SHAFT (R.H.)
			1		5	1900627	RETAINER, BEARING
			1		4	1900626	RETAINER, BEARING
			2		3	1900625	CARTRIDGE, BEARING
			1		2	1900622	RING-BASE
			1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED 16 SEP 63
APPROVAL 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

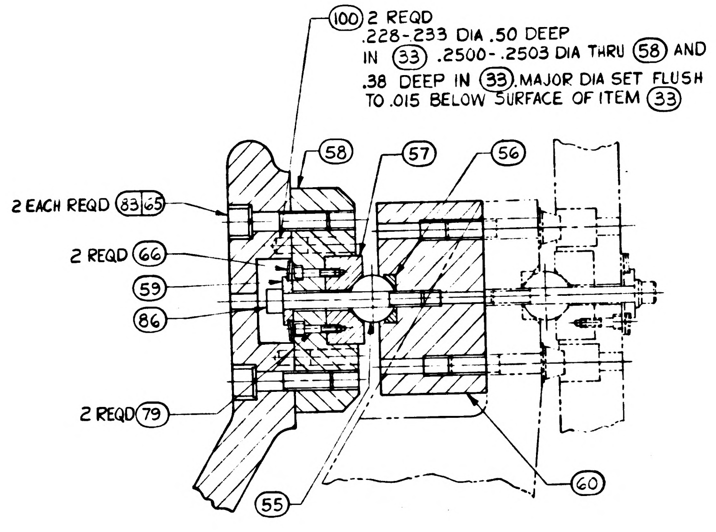
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

G & N MOUNTING FIXTURE ASSEMBLY

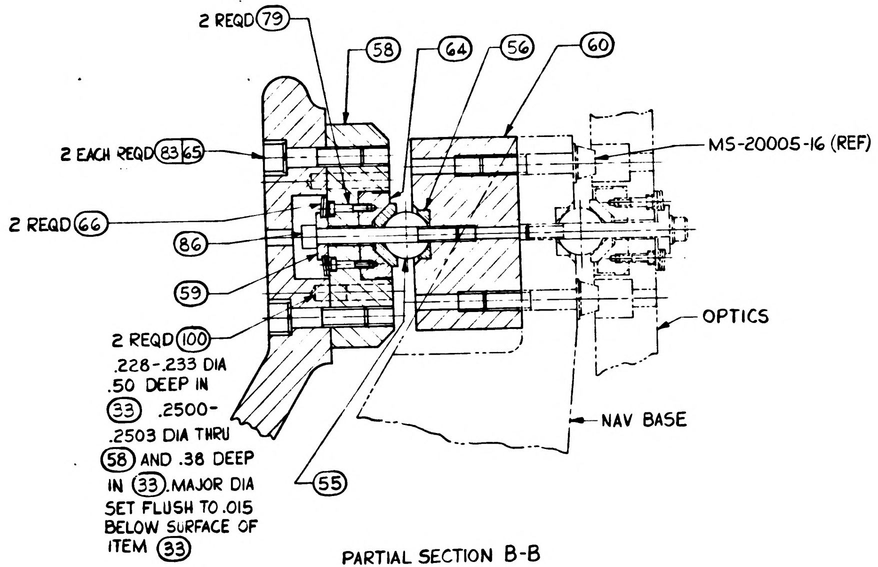
CODE IDENT NO.
SIZE J3
1900014
SCALE 1:4
SHEET 1 OF 2

1900014 SH 1

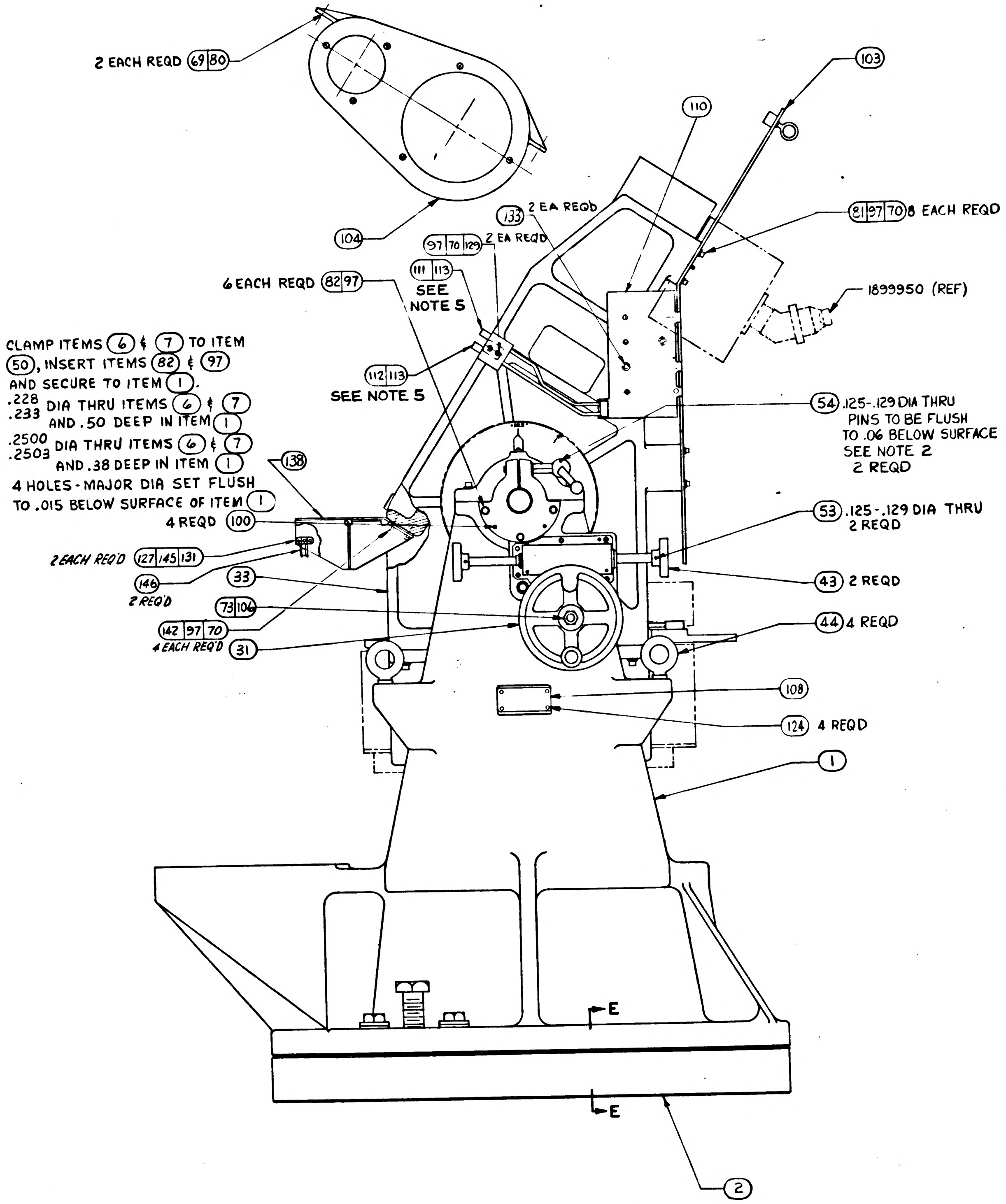
37/1900014

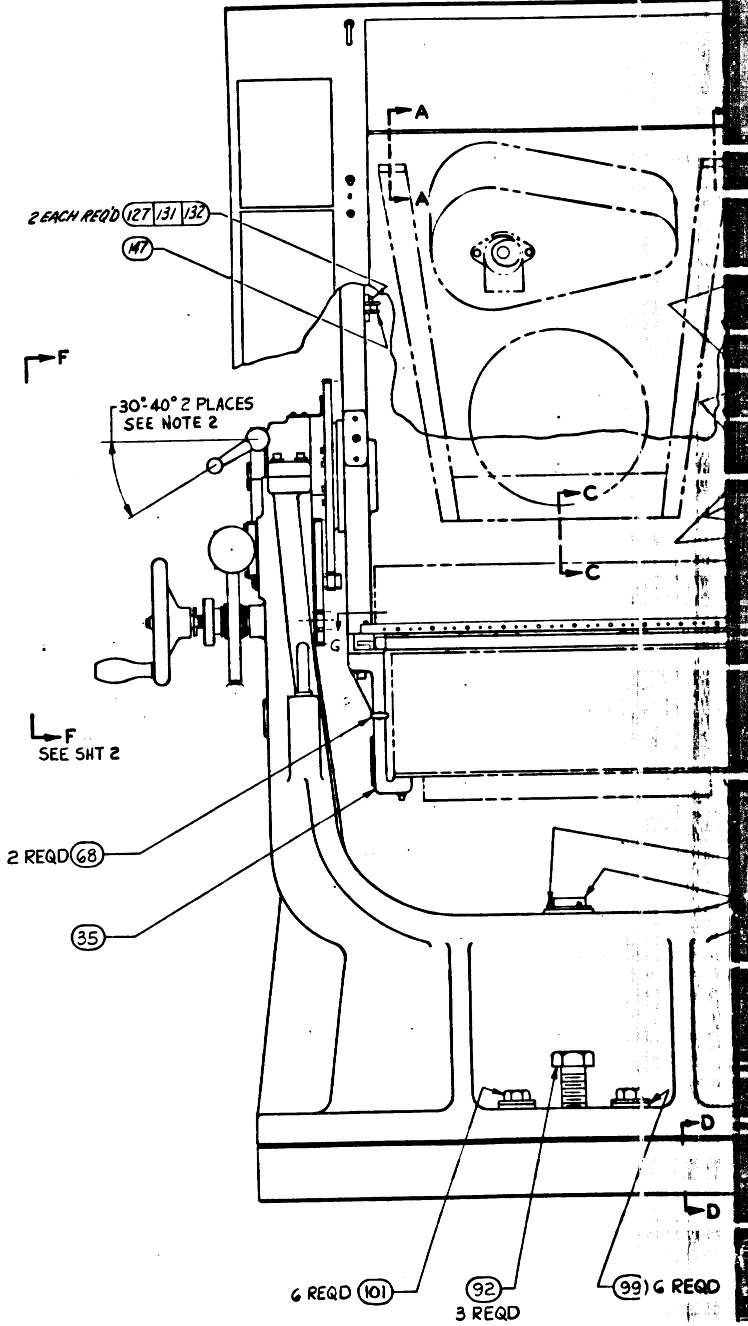

(100) 2 REQD
.228-233 DIA .50 DEEP
IN (33) .2500-.2503 DIA THRU (58) AND
.38 DEEP IN (33). MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (33)
2 EACH REQD (83|65)
2 REQD (66)
(59)
(86)
2 REQD (79)
(58)
(57)
(56)
(55)
(60)

PARTIAL SECTION A-A
FULL SCALE


2 REQD (79)
(58)
(64)
(56)
(60)
2 EACH REQD (83|65)
MS-20005-16 (REF)
2 REQD (66)
(86)
(59)
OPTICS
2 REQD (100)
.228-.233 DIA
.50 DEEP IN
(33) .2500-
.2503 DIA THRU
(58) AND .38 DEEP
IN (33). MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM (33)
NAV BASE
(55)

PARTIAL SECTION B-B
FULL SCALE


2 EACH REQD (69|80)
(103)
(110)
(104)
(133) 2 EA REQD
(97|70|129) 2 EA REQD
(81|97|70) 8 EACH REQD
6 EACH REQD (82|97)
(111|113)
SEE NOTE 5
1899950 (REF)
CLAMP ITEMS (6) & (7) TO ITEM
(50), INSERT ITEMS (82) & (97)
AND SECURE TO ITEM (1).
.228
.233 DIA THRU ITEMS (6) & (7)
AND .50 DEEP IN ITEM (1)
.2500
.2503 DIA THRU ITEMS (6) & (7)
AND .38 DEEP IN ITEM (1)
4 HOLES - MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (1)
4 REQD (100)
(112|113)
SEE NOTE 5
(138)
(54) .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
(53) .125-.129 DIA THRU
2 REQD
2 EACH REQ'D (127|145|131)
(146)
2 REQ'D
(33)
(73|106)
(142|97|70)
4 EACH REQ'D (31)
(43) 2 REQD
(44) 4 REQD
(108)
(124) 4 REQD
(1)
E
E
(2)


A
A
2 EACH REQ'D (127|131|132)
(147)
F
30°-40° 2 PLACES
SEE NOTE 2
C
C
G
F
SEE SHT 2
2 REQD (68)
(35)
D
D
6 REQD (101)
(92)
3 REQD
(99) 6 REQD

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. PIN ⑪ TO ⑧ OR ⑨ AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.

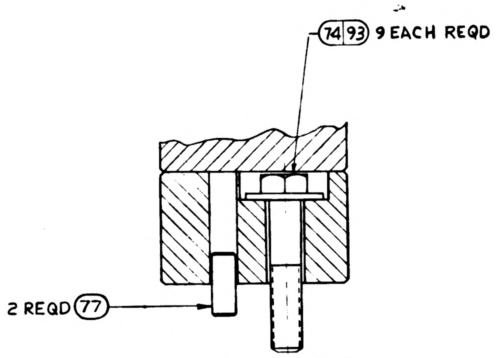
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

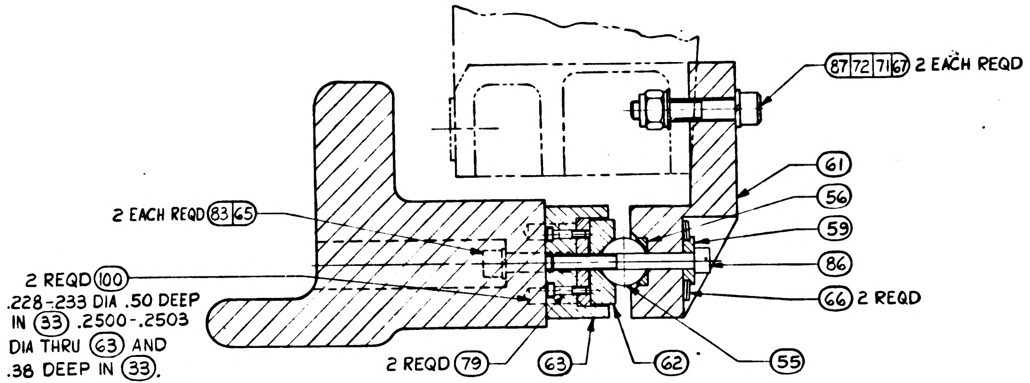
QUAN	ITEM NO
6	69
6	71
6	102
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144

5. INSTALLATION OF QUICK DISCONNECT COUPLING HALVES.
   A. APPLY A THIN FILM OF DOW-CORNING LUBRICANT NO. 55 (MIL-L-4343A) TO ENTIRE SURFACE OF ITEM (113).
   B. INSTALL ITEM (111) AND (112) WITH A TORQUE OF 65-75 IN-LB.

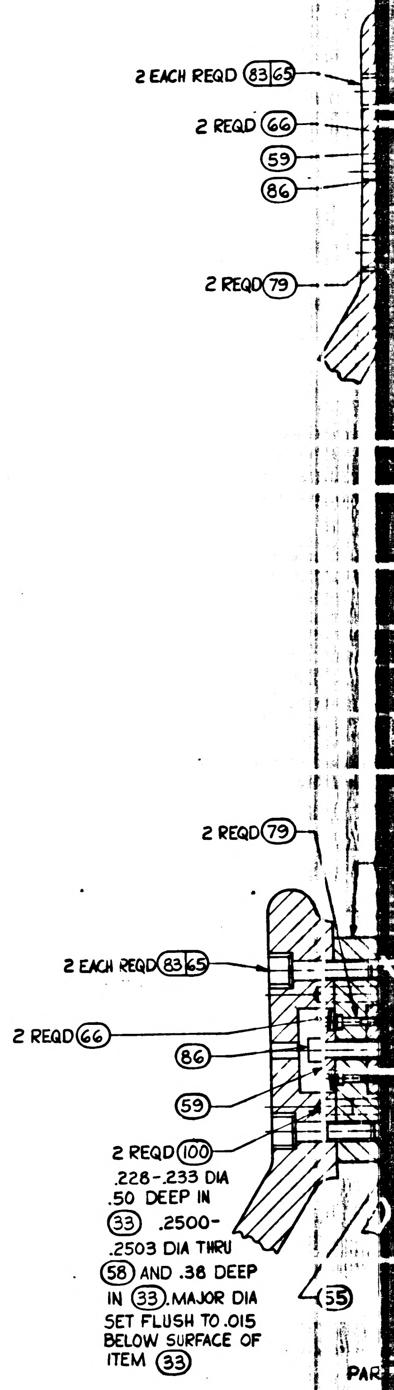
6. APPLY A LIGHT COATING OF MIL-L-6085 OIL TO ALL SLIDING SURFACES OF PARTS INDICATED.

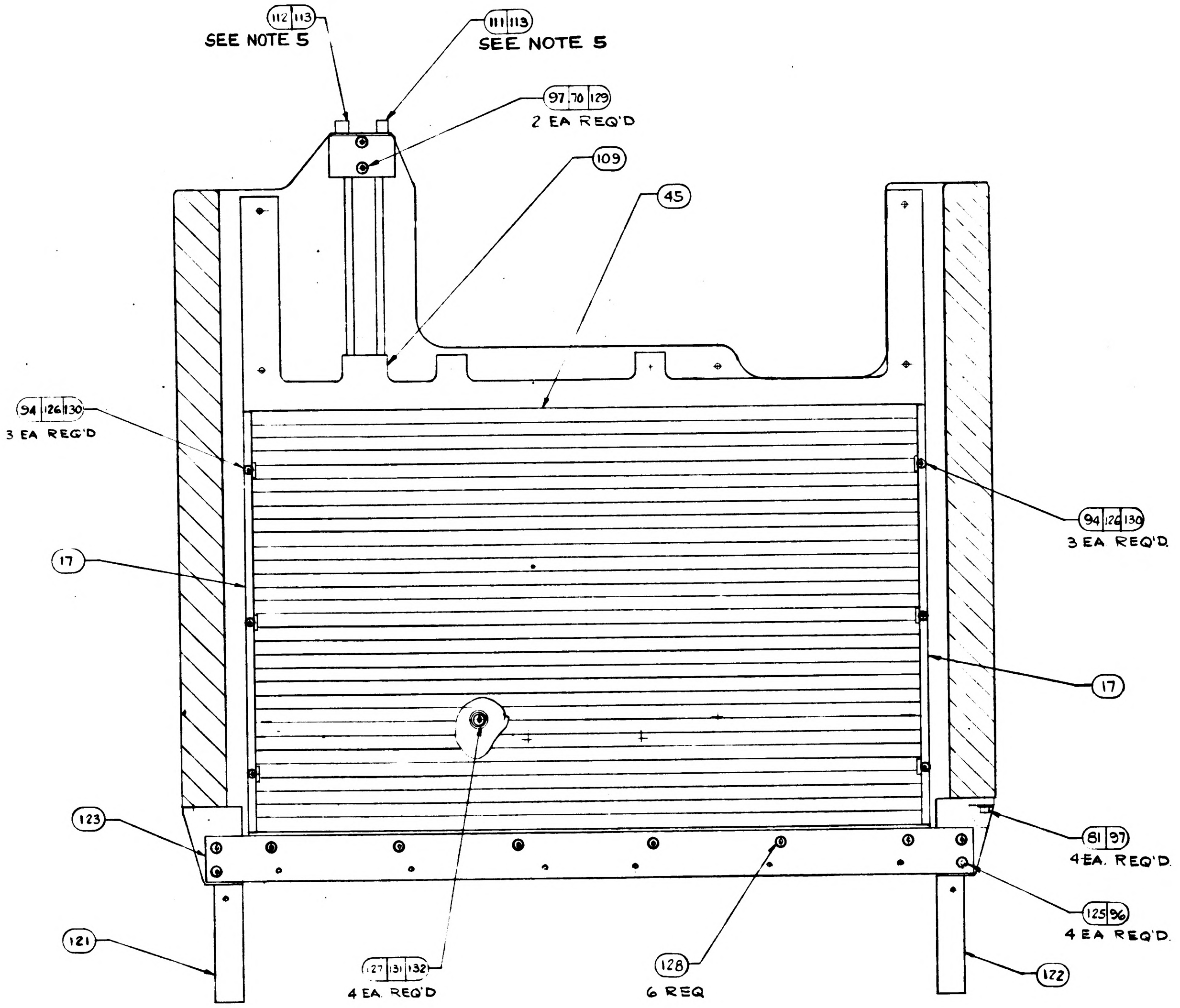

74|93 9 EACH REQD
2 REQD (77)

PARTIAL SECTION D-D
SCALE 1:2

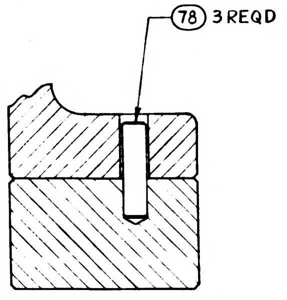

87|72|71|67 2 EACH REQD
2 EACH REQD 83|65
61
56
59
86
66 2 REQD
2 REQD (100)
.228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (63) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
2 REQD (79)
63
62
55

PARTIAL SECTION C-C
FULL SCALE


2 EACH REQD 83|65
2 REQD (66)
59
86
2 REQD (79)
2 REQD (79)
2 EACH REQD 83|65
2 REQD (66)
86
59
2 REQD (100)
.228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (58) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
55
PAR


112|113 SEE NOTE 5
111|113 SEE NOTE 5
97|70|129 2 EA REQ'D
109
45
94|126|130 3 EA REQ'D
94|126|130 3 EA REQ'D
17
17
123
81|97 4 EA. REQ'D
125|96 4 EA REQ'D
121
127|131|132 4 EA. REQ'D
128 6 REQ
122

VIEW G-G
(SCALE 1:2)



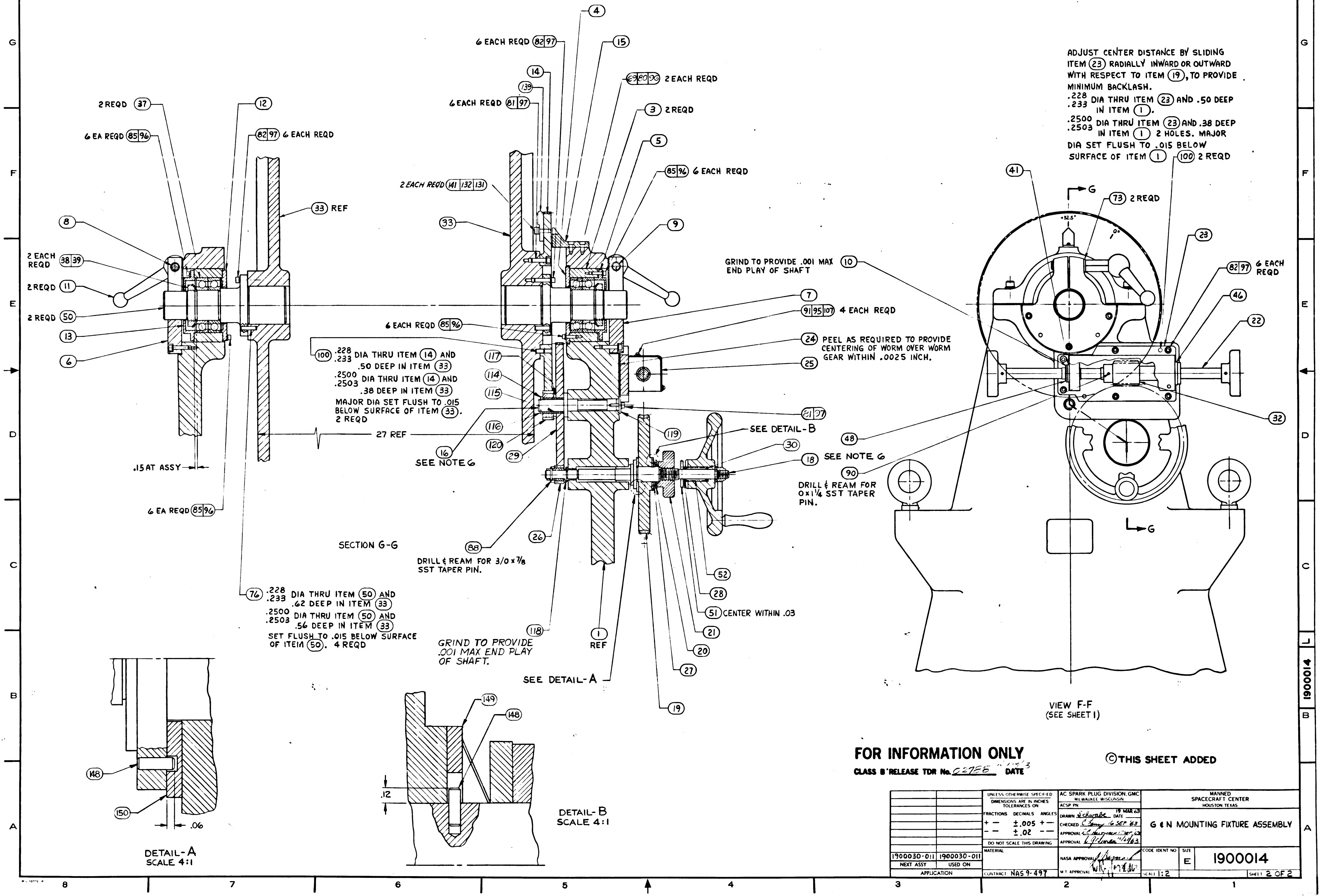
PARTIAL SECTION E-E
SCALE 1:2

AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION
MILWAUKEE, WISCONSIN
1900014

1900014 SH 1

17 1900014

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	THIS SHEET ADDED PER MXC-190286. PER TDRR 04045		24 SEP 63	RJM
E		CHANGE IN ACCORDANCE WITH MXC 131288 TDRR 07455		13 JAN 63	MEM
J		CHANGE IN ACCORDANCE WITH CM 196276 09224		17 APR 64	J.C
K		CHANGE IN ACCORDANCE WITH CM-196929 09275		3 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CM197337 10823		22 MAY 64	EM


6 EACH REQD (82|97)
(4)
(15)
(14)
(139)
(69|80|96) 2 EACH REQD
6 EACH REQD (81|97)
(3) 2 REQD
(5)
(85|96) 6 EACH REQD
2 EACH REQ'D (141|132|131)
(33)
(9)
2 REQD (37)
(12)
6 EA REQD (85|96)
(82|97) 6 EACH REQD
(33) REF
(8)
2 EACH REQD (38|39)
2 REQD (11)
2 REQD (50)
(13)
(6)
.15 AT ASSY
6 EA REQD (85|96)
GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT (10)
(7)
(91|95|107) 4 EACH REQD
6 EACH REQD (85|96)
(100) .228/.233 DIA THRU ITEM (14) AND .50 DEEP IN ITEM (33)
.2500/.2503 DIA THRU ITEM (14) AND .38 DEEP IN ITEM (33)
MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33). 2 REQD
(117)
(114)
(115)
(116)
(120)
(29)
(16) SEE NOTE 6
27 REF
(24) PEEL AS REQUIRED TO PROVIDE CENTERING OF WORM OVER WORM GEAR WITHIN .0025 INCH.
(25)
(81|97)
(119)
SEE DETAIL-B
(30)
(18) SEE NOTE 6
DRILL & REAM FOR 0×1¼ SST TAPER PIN.
SECTION G-G
(88) DRILL & REAM FOR 3/0×7/8 SST TAPER PIN.
(26)
(52)
(28)
(51) CENTER WITHIN .03
(21)
(20)
(27)
(19)
(76) .228/.233 DIA THRU ITEM (50) AND .62 DEEP IN ITEM (33)
.2500/.2503 DIA THRU ITEM (50) AND .56 DEEP IN ITEM (33)
SET FLUSH TO .015 BELOW SURFACE OF ITEM (50). 4 REQD
(118)
GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT.
(1) REF
SEE DETAIL-A
ADJUST CENTER DISTANCE BY SLIDING ITEM (23) RADIALLY INWARD OR OUTWARD WITH RESPECT TO ITEM (19), TO PROVIDE MINIMUM BACKLASH.
.228/.233 DIA THRU ITEM (23) AND .50 DEEP IN ITEM (1).
.2500/.2503 DIA THRU ITEM (23) AND .38 DEEP IN ITEM (1) 2 HOLES. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (1) (100) 2 REQD
(41)
G
(73) 2 REQD
+32.5°
0°
(23)
(82|97) 6 EACH REQD
(46)
(22)
(32)
(48)
(90)
G
VIEW F-F
(SEE SHEET 1)
(148)
(150)
.06
DETAIL-A
SCALE 4:1
(149)
(148)
.12
DETAIL-B
SCALE 4:1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 **DATE** 11-14-63

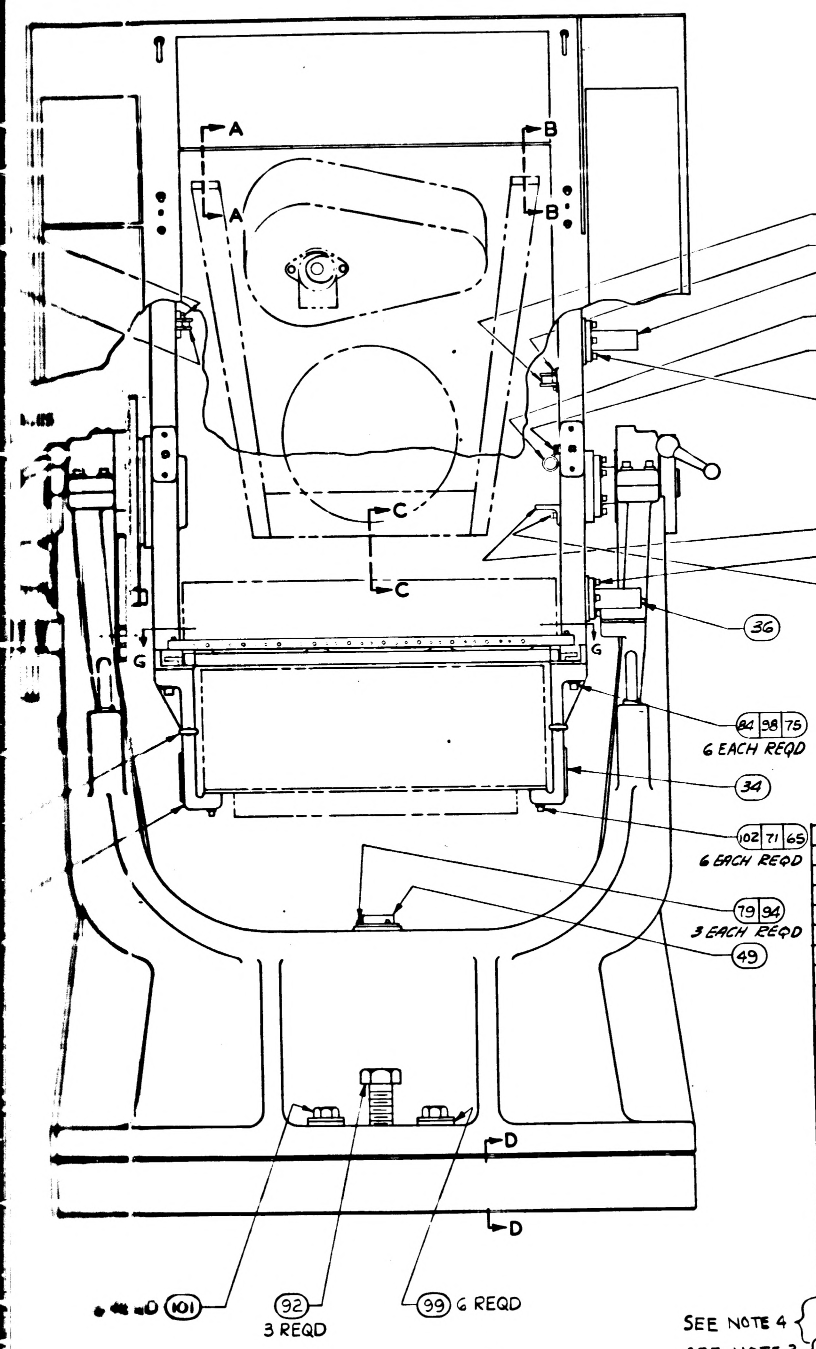
©THIS SHEET ADDED

1900030-011	1900030-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ±.005 ±.02 ANGLES ± — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE WISCONSIN ACSP PN DRAWN Schwabe DATE 19 MAR 63 CHECKED C. Berry 16 SEP '63 APPROVAL 17 SEP 63 APPROVAL 10/21/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS G & N MOUNTING FIXTURE ASSEMBLY
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL M.I.T. APPROVAL	CODE IDENT NO SIZE E 1900014
APPLICATION		CONTRACT NAS 9-497		SCALE 1:2 SHEET 2 OF 2

1900014
L

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 0409	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN 64	MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 [illegible] 07455		13 JAN 63	MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 [illegible] 07456		13 JAN 64	MEM
G		CHANGE IN ACCORDANCE WITH CM 194738 [illegible]		3 FEB 64	MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR [illegible]		26 FEB 64	W.L
J		CHANGE IN ACCORDANCE WITH CM 196276 -DRR 07224		23 APR 64	[illegible]
K		CHANGE IN ACCORDANCE WITH CM-196929 DRR 07445		13 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CM 197337 10823		22 MAY 64	EM
M		CHANGE IN ACCORDANCE WITH CM 197475 10824		11 JUNE 64	BK



	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				2		159	1901673	BLOCK-SUPPORT CLAMP
				1		158	1901672	BUS BAR
				1		157	MS35690-410	NUT-HEX, PLAIN
				1		156	AN960C616	(1897006-062) WASHER-FLAT
				4		155	1006783-47	SCREW-BUTTON HD., HEX SOC.
				1		154	1901685	STUD-GROUND
				1		153	1006783-51	SCREW-BUTTON HD., HEX SOC.
				28		152	1006783-26	SCREW-BUTTON HD., HEX SOC
				3		151	1006783-44	SCREW-BUTTON HD HEX SOC.
				1		150	1901667-001	WASHER, THRUST
				1		149	1901668-001	WASHER, THRUST
				2		148	MS171493	PIN, ROLL
				1		147		CLAMP-LOOP HINGED
				4		146		CLAMP-LOOP HINGED
				~~4~~		~~145~~	~~AN363C832~~	~~(1896990-281) NUT-SELF LOCKING~~
				8		144	AN363C632	(1896990-261) NUT-SELF LOCKING
				8		143	1006783-23	SCREW-BUTTON HD HEX SOC.
				4		142	MS16995-50	SCREW-CAP
				2		141	MS16995-28	SCREW-CAP
				1		140	1901650	BRACKET-CONN., ELEC
				1		139	1901643	GUARD-HARNESS
				1		138	1901639	BRACKET-CONN., ELEC.
				2		137	1901594	SCREW-SHOULDER
SEE NOTE 4				6		136	MS-16996-16	SCREW-CAP
SEE NOTE 3				8		135	1006783-29	SCREW-BUTTON HD. HEX. SOC.

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				2		133	1015831-249	SCREW-FLAT HD. HEX SOC
				46		132	MS-35338-80	WASHER-LOCK
SEE NOTE 4				52		131	AN960C-8L	(1897006-038) WASHER FLAT
				8		130	AN960C-4	(1897006-024) WASHER FLAT
				4		129	MS-16995-55	SCREW-CAP
				6		128	1015826-296	SCREW-FL.HD.
SEE NOTE 3				14		127	1006783-27	SCREW-BUTTON HD
				8		126	1006783-20	SCREW, BUTTON HD.
				4		125	MS-16996-14	SCREW-CAP SOC. HD.
				4		124	AN535-0-4	SCREW-DRIVE
				1		123	1900874	CAP-TOE, GSE, PSA
				1		122	1901348	BRACKET-SUPPORT R.H.
				1		121	1901347	BRACKET-SUPPORT L.H.
				1		120	1900939	PINION-CHANGE GEAR
				1		119	1900938	WASHER
				1		118	1900937	WASHER-STEP
				1		117	1900936	SPACER
				1		116	MS-16624-4075	RING-RETAINING
				1		115	1900940	BUSHING-COMPOUND
				1		114	1900935	WASHER-FLAT
				4		113	1000159-6	PACKING, PREFORMED O-RING
SEE NOTE 3				2		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
				2		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
				1		110	1900850	COLDPLATE, CDU (INSEP. ASS'Y)
				1		109	1900819	COLDPLATE, PSA, (INSEP. ASS'Y)
				1		108	1901304-211	PLATE, IDENTIFICATION
				12		107	AN960C6L	(1897006-036 WASHER-FLAT
				1		106	NAS1408C8	(1896868-108) NUT-SELF LOCKING
SEE NOTE 4				6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
				1		104	1900590	GUARD AND SEAL ASSY
				1		103	1900552	RACK
SEE NOTE 4				12		102	MS-16995-68	SCREW, HEX SOC
				6		101	MS35305-240	SCREW, CAP
				14		100	1016093-001	PIN-STEP DOWEL
SEE NOTE 3				6		99	1016095-007	WASHER-SPHERICAL
				7		98	MS35338-84	WASHER-LOCK, SPLIT
				61		97	MS35338-82	WASHER-LOCK, SPLIT
				33		96	MS35338-81	WASHER-LOCK, SPLIT
				4		95	MS35338-79	WASHER-LOCK, SPLIT
				11		94	MS35338-78	WASHER-LOCK, SPLIT
				9		93	MS35305-242	SCREW, CAP
				3		92	MS35300-316	SCREW, CAP
				4		91	MS35216-25	SCREW, MACHINE, PAN HD
				1		90	MS24692-162	PIN-TAPER
				1		89	MS24692-189	PIN-TAPER
				2		88	MS24692-108	PIN-TAPER
				2		87	MS16998-62	SCREW-HEX SOC
				3		86	MS16998-50	SCREW-HEX SOC
				24		85	MS16996-12	SCREW, CAP
				6		84	MS16995-84	SCREW, CAP
				6		83	MS16995-67	SCREW, CAP
				24		82	MS16995-53	SCREW, CAP
				27		81	MS16995-52	SCREW, CAP
				4		80	MS16995-37	SCREW, CAP
				9		79	MS16995-11	SCREW, CAP
				3		78	MS16556-104	PIN-STRAIGHT
				2		77	MS16556-101	PIN-STRAIGHT
				4		76	MS16555-648	PIN-STRAIGHT
				6		75	MS15795-315	WASHER, FLAT
				9		74	MS15795-126	WASHER, FLAT
				3		73	AN960C816	(1897006-082) WASHER-FLAT
				2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
SEE NOTE 4				14		71	AN960C516	(1897006-052) WASHER-FLAT
				18		70	AN960C416	(1897006-042) WASHER-FLAT
SEE NOTE 4				17		69	AN960C10	(1897006-017) WASHER-FLAT
SEE NOTE 3				2		68	1015916-001	BOLT-EYE
				2		67	NAS70V328-563	WASHER-FIBRE
				6		66	1899979	WASHER-BELLEVILLE
				12		65	MS-35338-83	WASHER-LOCK
				1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
				1		63	1900581	PAD
				1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
				1		61	1900580	MOUNT-BALL
				2		60	1900583	SPACER-BALL MOUNT
				3		59	1900962	COLLAR-CENTERING
				2		58	1900582	PAD
				1		57	1900968	INSERT-BALL MOUNT. STAT.
				3		56	1900972	INSERT
				3		55	1900963	BALL-PRECISION
				2		54	MS-171537	PIN-SPRING
				2		53	MS-171536	PIN-SPRING
				1		52	MS-24585-C499	(1897067-499) SPRING
				1		51	MS171600	PIN, SPRING
				2		50	1900624	SHAFT-TRUNNION
SEE NOTE 3				1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
				1		48	MS-16624-4075	RING, RETAINING
				~~2~~		~~47~~	~~1901622-002~~	~~BEARING THRUST~~
				1		46	MS-17796-112	BEARING-SLEEVE
				1		45	1901369	PAD, THERMAL INTERFACE
SEE NOTE 3				4		44	1015916-003	BOLT-EYE
				2		43	1900632	KNOB, FINE ADJUST
				~~1~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
				1		41	MS-17796-89	BEARING, SLEEVE
				~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0278C DATE

Ⓒ REPLACES REV "B" WITH CHANGE

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2		39	MS-172211	WASHER, KEY, BEARING RETAINING
			2		38	MS-172246	NUT, SPANNER
			2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
			2		36	1900571	SHAFT, STOP
			1		35	1900716	BRACKET, MOUNTING (L.H.)
			1		34	1900715	BRACKET, MOUNTING (R.H.)
			1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
			1		32	1900776	WORM R.H.
			1		31	1900724	HANDWHEEL
			1		30	1900723	WASHER
			1		29	1900722	GEAR, INTERMEDIATE
			1		28	1900721	GUIDE, SPRING
			1		27	1900720	WASHER, SPRING
			1		26	1900647	PINION
			1		25	1900646	COVER-WORM
			1		24	1900645	SHIM, LAMINATED
			1		23	1900644	BRACKET, WORM
			1		22	1900643	SHAFT, WORM, FINE ADJUST
			1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
			1		20	1900641	WASHER, THRUST
			1		19	1900640	GEAR-WORM R.H.
			1		18	1900639	SHAFT, COARSE ADJUST
			2		17	1901370	CLAMP, THERMAL INTERFACE MATL
			1		16	1900637	SHAFT, GEAR
			1		15	1900636	POINTER-INDEX
			1		14	1900635	GEAR-OUTPUT
			1		13	1900634	CAP, BEARING
			1		12	1900633	CAP, BEARING
			2		11	1900725	LEVER, SHAFT LOCK
			1		10	1900631	WASHER, THRUST
			1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
			1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
			1		7	1900629	LOCK-SHAFT (L.H.)
			1		6	1900628	LOCK-SHAFT (R.H.)
			1		5	1900627	RETAINER, BEARING
			1		4	1900626	RETAINER, BEARING
			2		3	1900625	CARTRIDGE, BEARING
			1		2	1900622	RING-BASE
			1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

LIST OF PARTS AND MATERIALS

M	L
L	L
K	K
J	J
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

H	E
G	E
F	E
E	E
[illegible]	C
[illegible]	C
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN Schwabe DATE 19 MAR 63
CHECKED C. Jang 16 SEP 63
APPROVAL [illegible] 17 SEP 63
APPROVAL J. Feiman [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

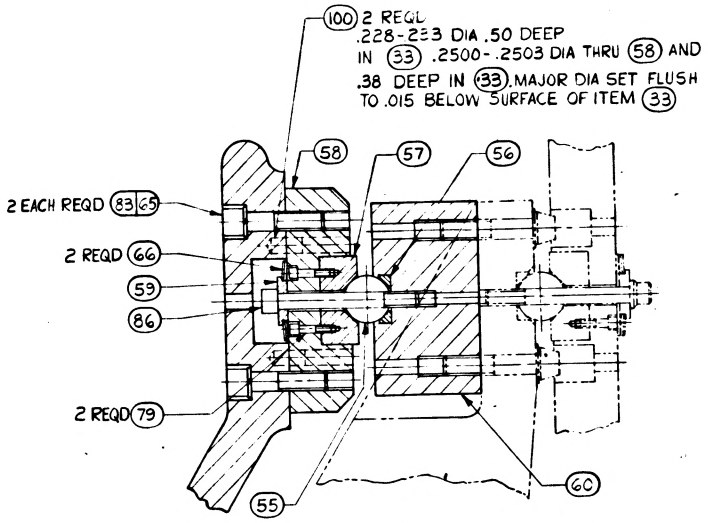
G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO
SIZE J3
1900014
SCALE 1:4
SHEET 1 OF 2

1900014

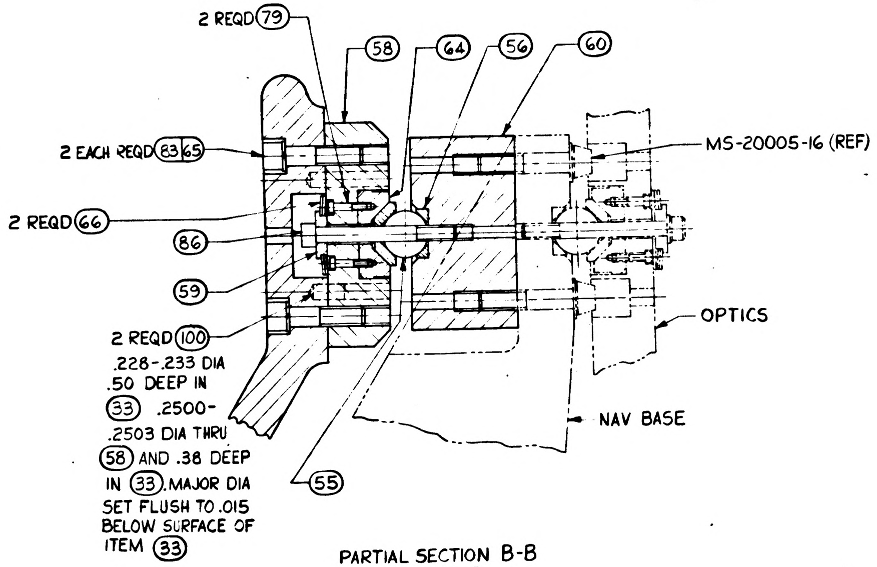
371900014

1 & EACH REQD



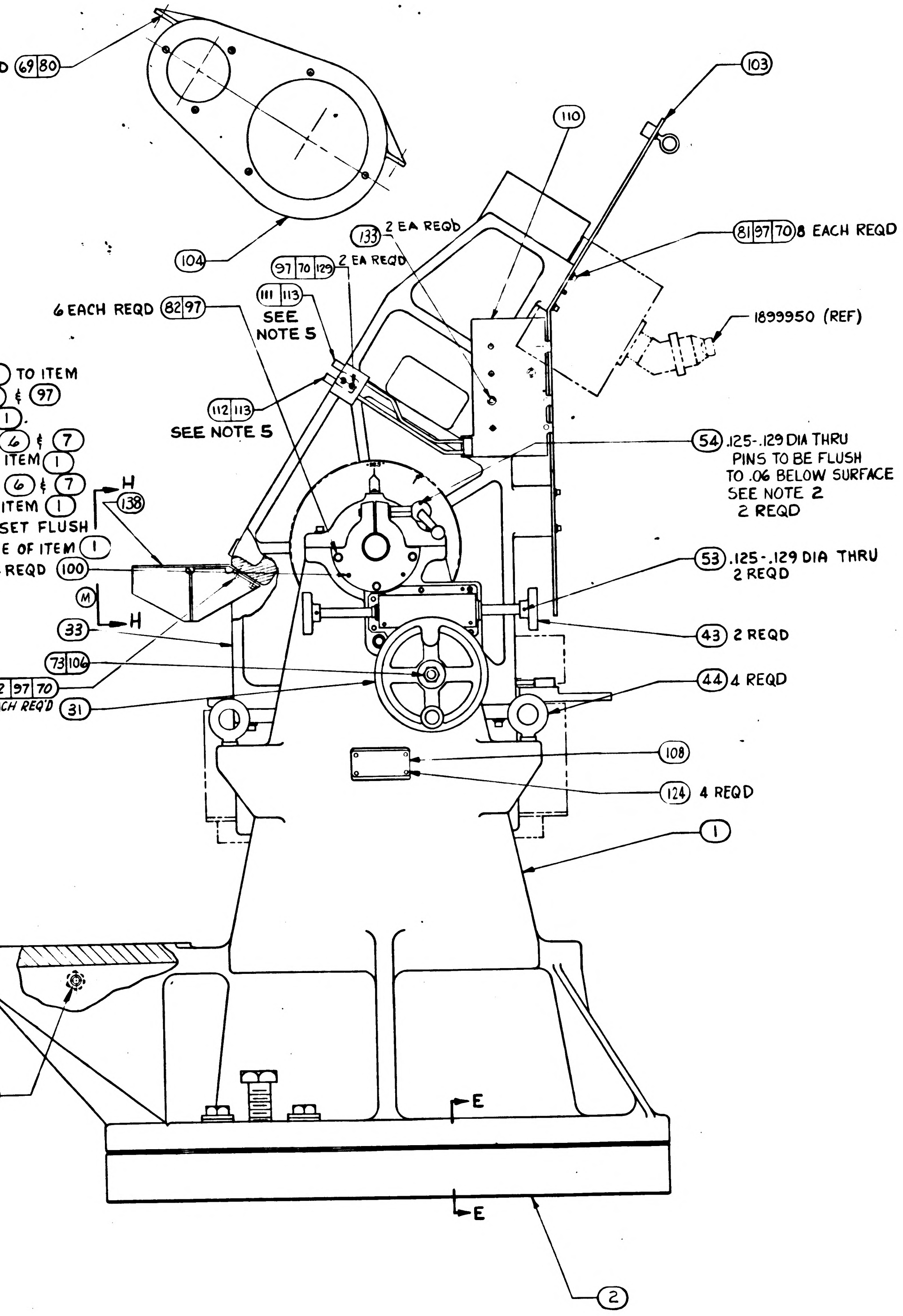
(100) 2 REQD
.228-.233 DIA .50 DEEP
IN (33) .2500-.2503 DIA THRU (58) AND
.38 DEEP IN (33). MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (33)
(58)
(57)
(56)
2 EACH REQD (83)(65)
2 REQD (66)
(59)
(86)
2 REQD (79)
(55)
(60)

PARTIAL SECTION A-A
FULL SCALE

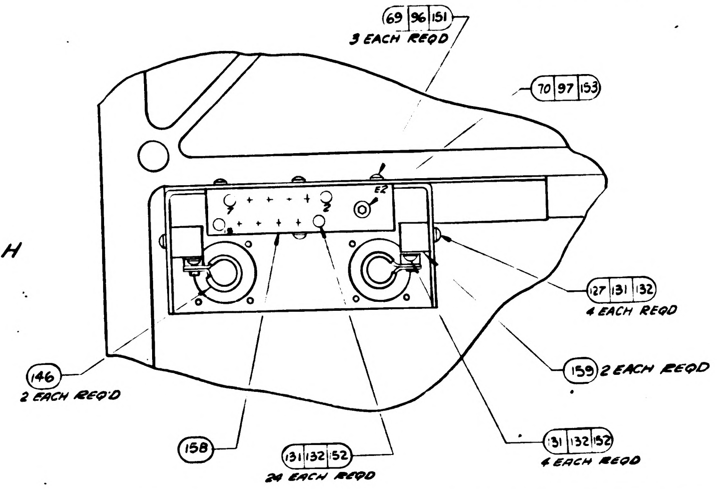


2 REQD (79)
(58)
(64)
(56)
(60)
2 EACH REQD (83)(65)
MS-20005-16 (REF)
2 REQD (66)
(86)
(59)
OPTICS
2 REQD (100)
.228-.233 DIA
.50 DEEP IN
(33) .2500-
.2503 DIA THRU
(58) AND .38 DEEP
IN (33). MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM (33)
NAV BASE
(55)

PARTIAL SECTION B-B
FULL SCALE

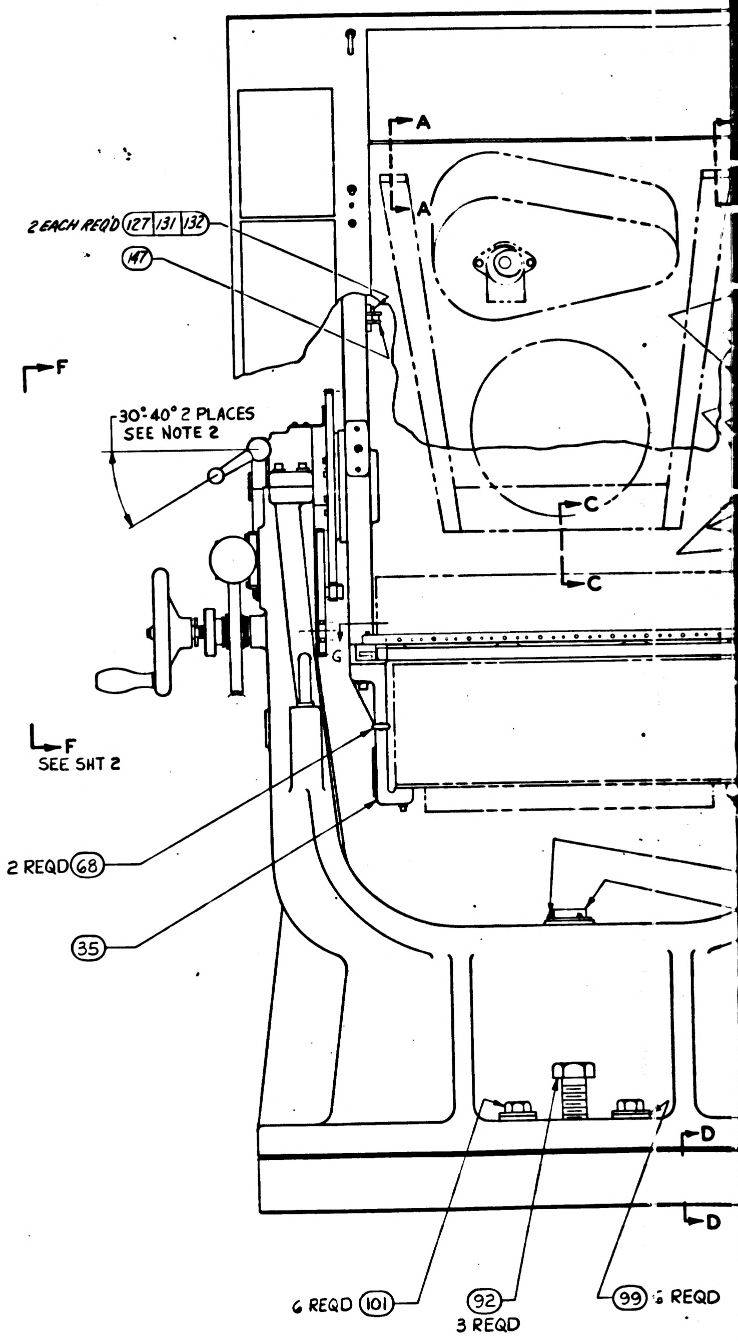


2 EACH REQD (69)(80)
(103)
(110)
(104)
(133) 2 EA REQD
(81)(97)(70) 8 EACH REQD
(97)(70)(129) 2 EA REQD
(111)(113)
SEE NOTE 5
6 EACH REQD (82)(97)
1899950 (REF)
CLAMP ITEMS (6) & (7) TO ITEM
(50), INSERT ITEMS (82) & (97)
AND SECURE TO ITEM (1).
.228
.233 DIA THRU ITEMS (6) & (7)
AND .50 DEEP IN ITEM (1)
.2500
.2503 DIA THRU ITEMS (6) & (7)
AND .38 DEEP IN ITEM (1)
4 HOLES - MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (1)
(112)(113)
SEE NOTE 5
(54) .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
H
(138)
4 REQD (100)
(53) .125-.129 DIA THRU
2 REQD
(M)
(33)
H
(43) 2 REQD
(73)(106)
(142)(97)(70)
4 EACH REQ'D (31)
(44) 4 REQD
(108)
(124) 4 REQD
(1)
(M)
(70)(97)(98)(156)(157)(54)
E
E
(2)



(M)
(69)(96)(151)
3 EACH REQD
(70)(97)(153)
E2
(127)(131)(132)
4 EACH REQD
(159) 2 EACH REQD
(146)
2 EACH REQ'D
(158)
(131)(132)(52)
24 EACH REQD
(131)(132)(152)
4 EACH REQD

PARTIAL VIEW H-H
SCALE 1:2



A
A
2 EACH REQD (127)(131)(132)
(M7)
F
30°-40° 2 PLACES
SEE NOTE 2
C
C
F
SEE SHT 2
2 REQD (68)
(35)
D
D
6 REQD (101)
(92)
3 REQD
(99) 6 REQD

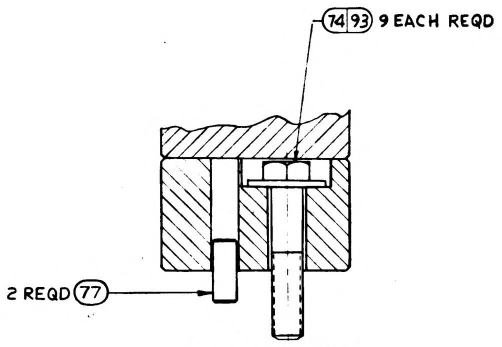
1900014
AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION

NOTES:

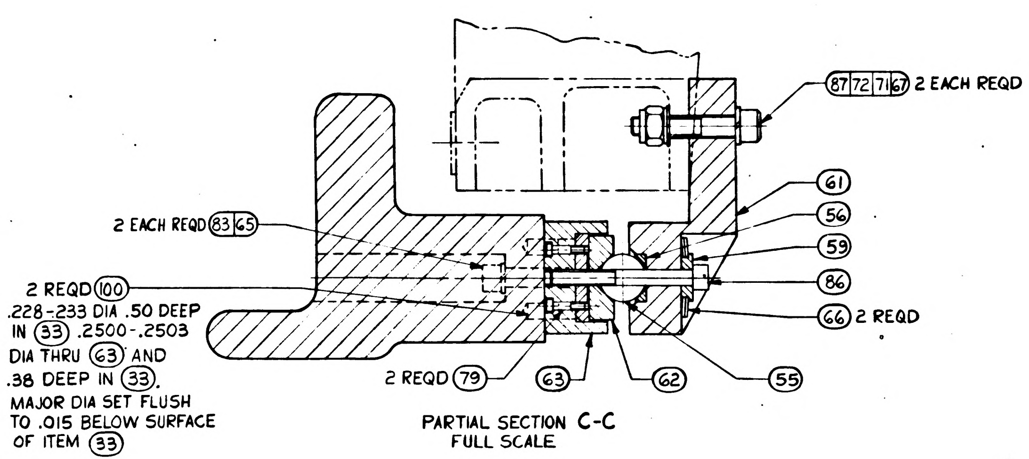
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. PIN (11) TO (8) OR (9) AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING
4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

QUAN.	ITEM NO
10	69
6	71
6	102
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144
4	155

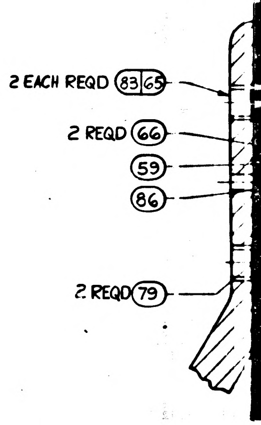
5. INSTALLATION OF QUICK DISCONNECT COUPLING HALVES.
   A. APPLY A THIN FILM OF DOW-CORNING LUBRICANT NO. 55 (MIL-L-4343A) TO ENTIRE SURFACE OF ITEM (113).
   B. INSTALL ITEM (111) AND (112) WITH A TORQUE OF 65-75 IN-LB.
6. APPLY A LIGHT COATING OF MIL-L-6085 OIL TO ALL SLIDING SURFACES OF PARTS INDICATED.

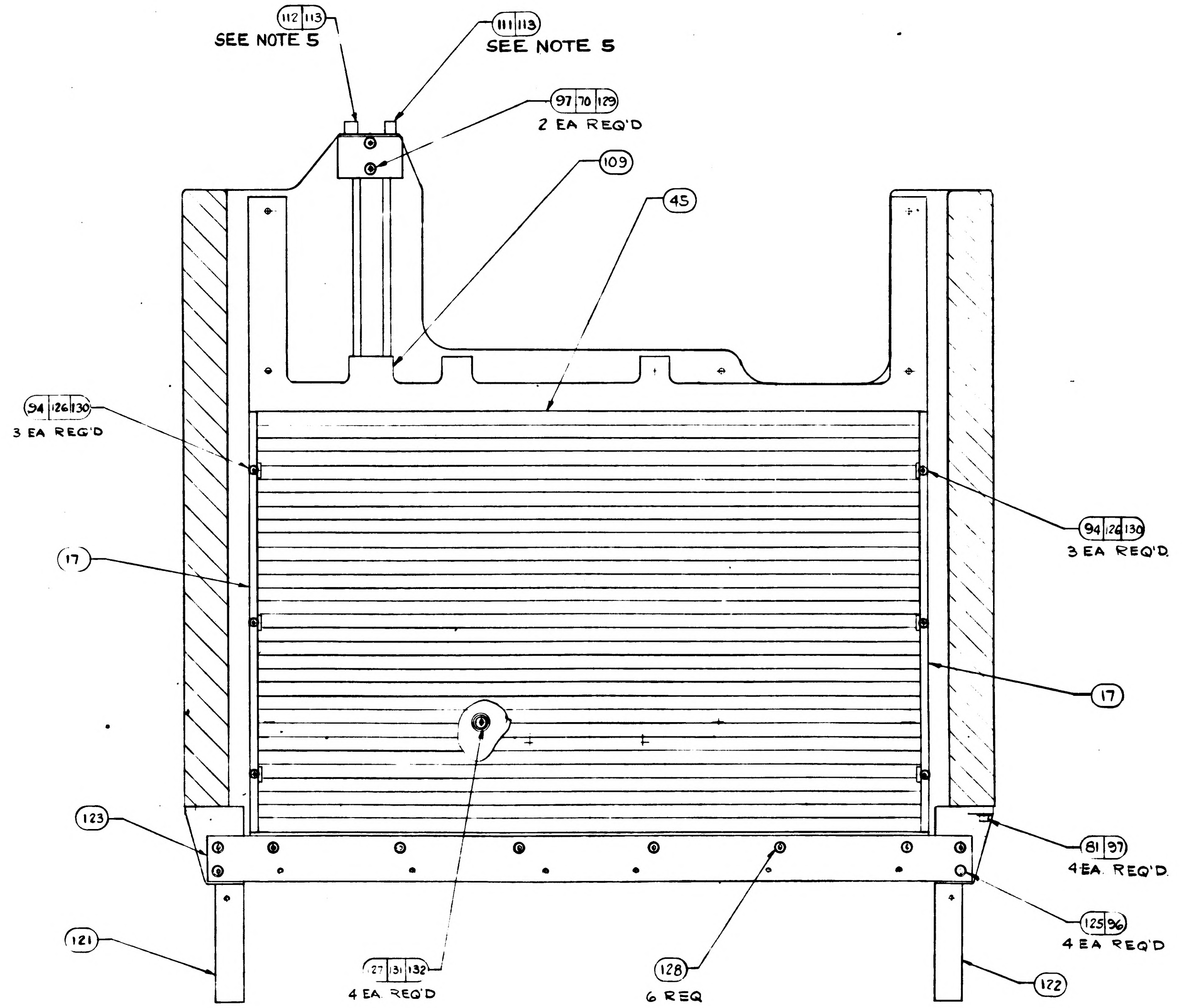

74|93 9 EACH REQD
2 REQD (77)

PARTIAL SECTION D-D
SCALE 1:2

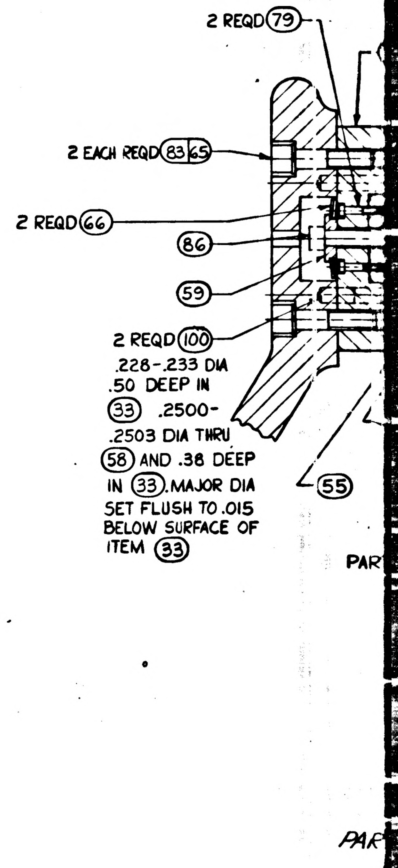

87|72|71|67 2 EACH REQD
2 EACH REQD 83|65
(61)
(56)
(59)
(86)
(66) 2 REQD
2 REQD (100)
.228-233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (63) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
2 REQD (79)
(63)
(62)
(55)

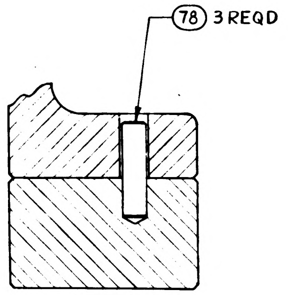
PARTIAL SECTION C-C
FULL SCALE


2 EACH REQD 83|65
2 REQD (66)
(59)
(86)
2 REQD (79)


112|113
SEE NOTE 5
111|113
SEE NOTE 5
97|70|129
2 EA REQ'D
(109)
(45)
94|126|130
3 EA REQ'D
(17)
94|126|130
3 EA REQ'D
(17)
(123)
81|97
4 EA. REQ'D
125|96
4 EA REQ'D
(121)
127|131|132
4 EA. REQ'D
(128)
6 REQ
(122)

VIEW G-G
(SCALE 1:2)

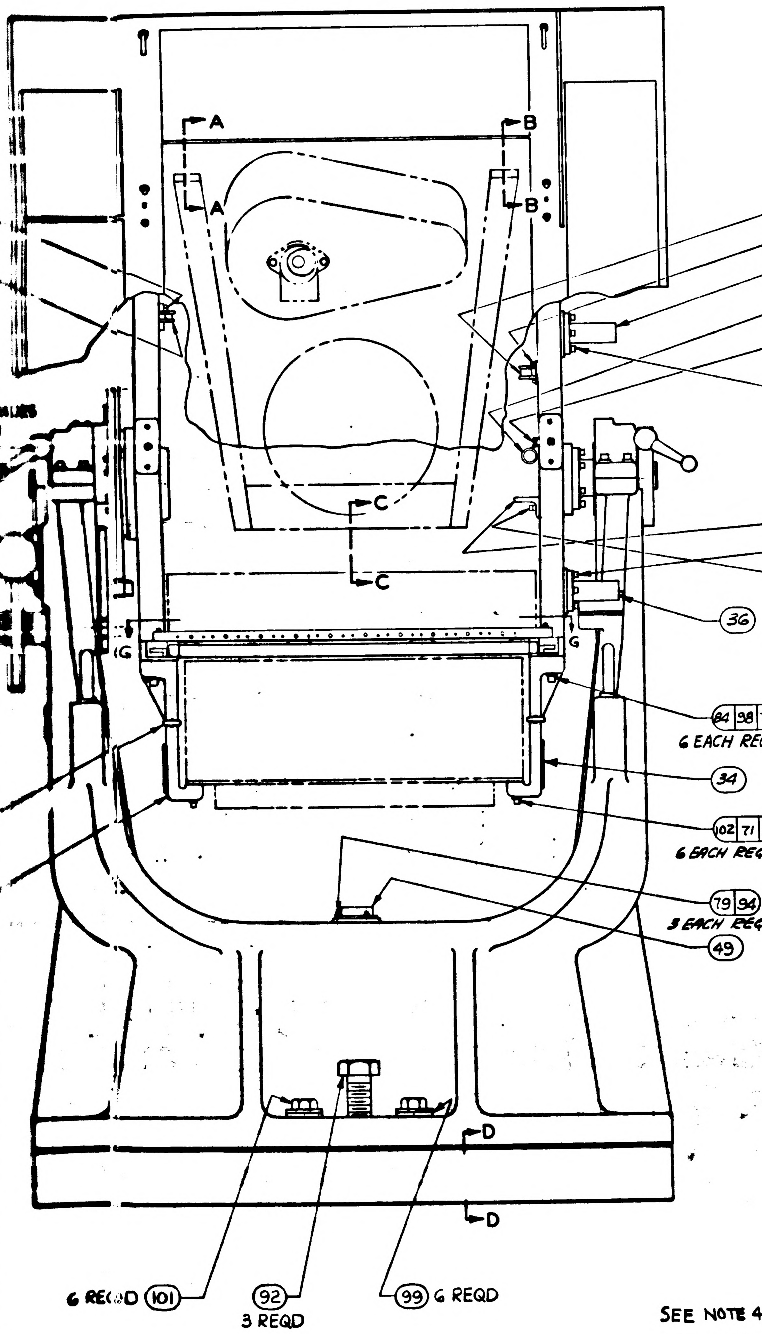

2 REQD (79)
2 EACH REQD 83|65
2 REQD (66)
(86)
(59)
2 REQD (100)
.228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (58) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
(55)
PAR
PAR



PARTIAL SECTION E-E
SCALE 1:2

MIL FORM 1050 J3

1900014 SH 1



	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		159	1901673	BLOCK-SUPPORT CLAMP
	1		158	1901672	BUS BAR
	1		157	MS35690-410	NUT-HEX, PLAIN
	1		156	AN960C616	(1897006-062) WASHER-FLAT
	4		155	1006783-47	SCREW-BUTTON HD., HEX SOC.
	1		154	1901685	STUD-GROUND
	1		153	1006783-51	SCREW-BUTTON HD, HEX SOC.
	28		152	1006783-26	SCREW-BUTTON HD., HEX SOC.
	3		151	1006783-44	SCREW-BUTTON HD, HEX SOC.
	1		150	1901667-001	WASHER, THRUST
	1		149	1901668-001	WASHER, THRUST
	2		148	MS171493	PIN, ROLL
	1		147	1010400-1	CLAMP-LOOP HINGED
	4		146	1010400-3	CLAMP-LOOP HINGED
	~~4~~		~~145~~	~~AN363C832~~	~~(1896990-281) NUT-SELF LOCKING~~
	8		144	AN363C632	(1896990-261) NUT-SELF LOCKING
	8		143	1006783-23	SCREW-BUTTON HD HEX SOC.
	4		142	MS16995-50	SCREW-CAP
	2		141	MS16995-28	SCREW-CAP
	1		140	1901650	BRACKET-CONN., ELEC
	1		139	1901643	GUARD-HARNESS
	1		138	1901639	BRACKET-CONN., ELEC.
SEE NOTE 4	2		137	1901594	SCREW-SHOULDER
	6		136	MS-16996-16	SCREW-CAP
SEE NOTE 3	8		135	1006783-29	SCREW-BUTTON HD. HEX. SOC.

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		133	1015831-249	SCREW-FLAT HD. HEX. SOC
	46		132	MS-35338-80	WASHER-LOCK
SEE NOTE 4	52		131	AN960-C-8L	(1897006-038) WASHER FLAT
	8		130	AN960-C-4	(1897006-024) WASHER FLAT
	4		129	MS-16995-55	SCREW-CAP
	6		128	1015826-296	SCREW-FL.HD.
SEE NOTE 3	14		127	1006783-27	SCREW-BUTTON HD
	8		126	1006783-20	SCREW, BUTTON HD.
	4		125	MS-16996-14	SCREW-CAP SOC. HD.
	4		124	AN535-0-4	SCREW-DRIVE
	1		123	1900874	CAP-TOE, GSE, PSA.
	1		122	1901348	BRACKET-SUPPORT R.H.
	1		121	1901347	BRACKET-SUPPORT L.H.
	1		120	1900939	PINION-CHANGE GEAR
	1		119	1900938	WASHER
	1		118	1900937	WASHER-STEP
	1		117	1900936	SPACER
	1		116	MS-16624-4075	RING-RETAINING
	1		115	1900940	BUSHING-COMPOUND
	1		114	1900935	WASHER-FLAT
	4		113	1000159-6	PACKING, PREFORMED O-RING
SEE NOTE 3	2		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
	2		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
	1		110	1900850	COLDPLATE, CDU (INSEP. ASS'Y)
	1		109	1900819	COLDPLATE, PSA, (INSEP. ASS'Y)
	1		108	1901304-211	PLATE, IDENTIFICATION
	12		107	AN960C6L	(1897006-036 WASHER-FLAT
	1		106	NAS1408C8	(1896868-108) NUT-SELF LOCKING
SEE NOTE 4	6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
	1		104	1900590	GUARD AND SEAL ASSY
	1		103	1900552	RACK
SEE NOTE 4	12		102	MS-16995-68	SCREW, HEX SOC
	6		101	MS35305-240	SCREW, CAP
	14		100	1016093-001	PIN-STEP DOWEL
SEE NOTE 3	6		99	1016095-007	WASHER-SPHERICAL
	7		98	MS35338-84	WASHER-LOCK, SPLIT
	61		97	MS35338-82	WASHER-LOCK, SPLIT
	33		96	MS35338-81	WASHER LOCK, SPLIT
	4		95	MS35338-79	WASHER-LOCK, SPLIT
	11		94	MS35338-78	WASHER-LOCK, SPLIT
	9		93	MS35305-242	SCREW, CAP
	3		92	MS35300-316	SCREW, CAP
	4		91	MS35216-25	SCREW, MACHINE, PAN HD
	1		90	MS24692-162	PIN-TAPER
	1		89	MS24692-189	PIN-TAPER
	2		88	MS24692-108	PIN-TAPER
	2		87	MS16998-62	SCREW-HEX SOC
	3		86	MS16998-50	SCREW-HEX SOC
	24		85	MS16996-12	SCREW, CAP
	6		84	MS16995-84	SCREW, CAP
	6		83	MS16995-67	SCREW, CAP
	24		82	MS16995-53	SCREW, CAP
	27		81	MS16995-52	SCREW, CAP
	4		80	MS16995-37	SCREW, CAP
	9		79	MS16995-11	SCREW, CAP
	3		78	MS16556-104	PIN-STRAIGHT
	2		77	MS16556-101	PIN-STRAIGHT
	4		76	MS16555-648	PIN-STRAIGHT
	6		75	MS15795-315	WASHER, FLAT
	9		74	MS15795-126	WASHER, FLAT
	3		73	AN960C816	(1897006-082) WASHER-FLAT
	2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
SEE NOTE 4	14		71	AN960C516	(1897006-052) WASHER-FLAT
	18		70	AN960C416	(1897006-042) WASHER-FLAT
SEE NOTE 4	17		69	AN960C10	(1997006-017) WASHER-FLAT
SEE NOTE 3	2		68	1015916-001	BOLT-EYE
	2		67	NAS70V328-563	WASHER-FIBRE
	6		66	1899979	WASHER-BELLEVILLE
	12		65	MS-35338-83	WASHER-LOCK
	1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
	1		63	1900581	PAD
	1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
	1		61	1900580	MOUNT-BALL
	2		60	1900583	SPACER-BALL MOUNT
	3		59	1900962	COLLAR-CENTERING
	2		58	1900582	PAD
	1		57	1900968	INSERT-BALL MOUNT. STAT.
	3		56	1900972	INSERT
	3		55	1900963	BALL-PRECISION
	2		54	MS-171537	PIN-SPRING
	2		53	MS-171536	PIN-SPRING
	1		52	MS-24585-C499	(1897067-499) SPRING
	1		51	MS171600	PIN, SPRING
	2		50	1900624	SHAFT-TRUNNION
SEE NOTE 3	1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
	1		48	MS-16624-4075	RING, RETAINING
	~~2~~		~~47~~	~~1901622-002~~	~~BEARING THRUST~~
	1		46	MS-17796-112	BEARING-SLEEVE
	1		45	1901369	PAD, THERMAL INTERFACE
SEE NOTE 3	4		44	1015916-003	BOLT-EYE
	2		43	1900632	KNOB, FINE ADJUST
	~~7~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
	1		41	MS-17796-89	BEARING, SLEEVE
	~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 04095	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN -64	MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDR 07455		13 JAN -63	MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 TDR 07456		13 JAN 64	JJ MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 TDR 07457		3 FEB -64	MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR		26 FEB 64	
J		CHANGE IN ACCORDANCE WITH CM 196276		23 APR 64	J.C.
K		CHANGE IN ACCORDANCE WITH CM-196929		18 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CM 197337 10823		22 MAY 64	EM
M		CHANGE IN ACCORDANCE WITH CM 197475 10824		11 JUNE 64	BK
N		CHANGE IN ACCORDANCE WITH CM 197506 10825		16 JUNE 64	BK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 DATE

© REPLACES REV "B" WITH CHANGE

	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		39	MS-172211	WASHER, KEY, BEARING RETAINING
	2		38	MS-172246	NUT, SPANNER
	2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
	2		36	1900571	SHAFT, STOP
	1		35	1900716	BRACKET, MOUNTING (L.H.)
	1		34	1900715	BRACKET, MOUNTING (R.H.)
	1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
	1		32	1900776	WORM R.H.
	1		31	1900724	HANDWHEEL
	1		30	1900723	WASHER
	1		29	1900722	GEAR, INTERMEDIATE
	1		28	1900721	GUIDE, SPRING
	1		27	1900720	WASHER, SPRING
	1		26	1900647	PINION
	1		25	1900646	COVER-WORM
	1		24	1900645	SHIM, LAMINATED
	1		23	1900644	BRACKET, WORM
	1		22	1900643	SHAFT, WORM, FINE ADJUST
	1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
	1		20	1900641	WASHER, THRUST
	1		19	1900640	GEAR-WORM R.H.
	1		18	1900639	SHAFT, COARSE ADJUST
	2		17	1901370	CLAMP, THERMAL INTERFACE MATL
	1		16	1900637	SHAFT, GEAR
	1		15	1900636	POINTER-INDEX
	1		14	1900635	GEAR-OUTPUT
	1		13	1900634	CAP, BEARING
	1		12	1900633	CAP, BEARING
	2		11	1900725	LEVER, SHAFT LOCK
	1		10	1900631	WASHER, THRUST
	1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
	1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
	1		7	1900629	LOCK-SHAFT (L.H.)
	1		6	1900628	LOCK-SHAFT (R.H.)
	1		5	1900627	RETAINER, BEARING
	1		4	1900626	RETAINER, BEARING
	2		3	1900625	CARTRIDGE, BEARING
	1		2	1900622	RING-BASE
	1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
N	L
M	L
L	L
K	K
J	J

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2
H	E
G	E
F	E
E	E
D	C
C	C

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED 16 SEP 63
APPROVAL 12 SEP 63
APPROVAL 10/63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

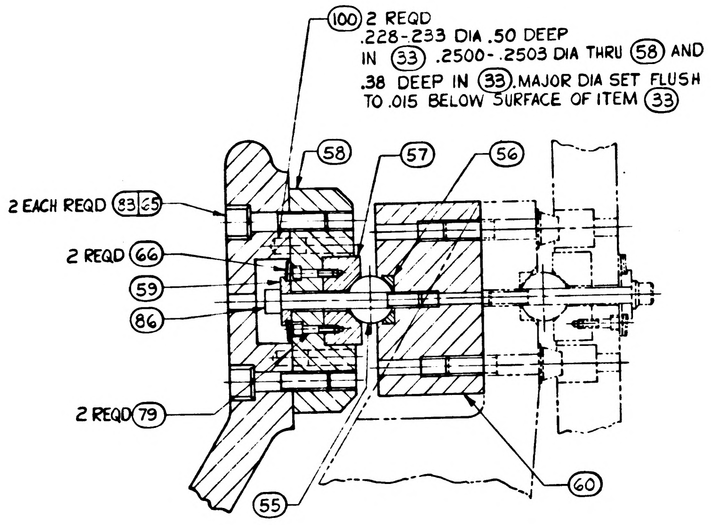
G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO. SIZE J3 1900014
SCALE 1:4 SHEET 1 OF 2

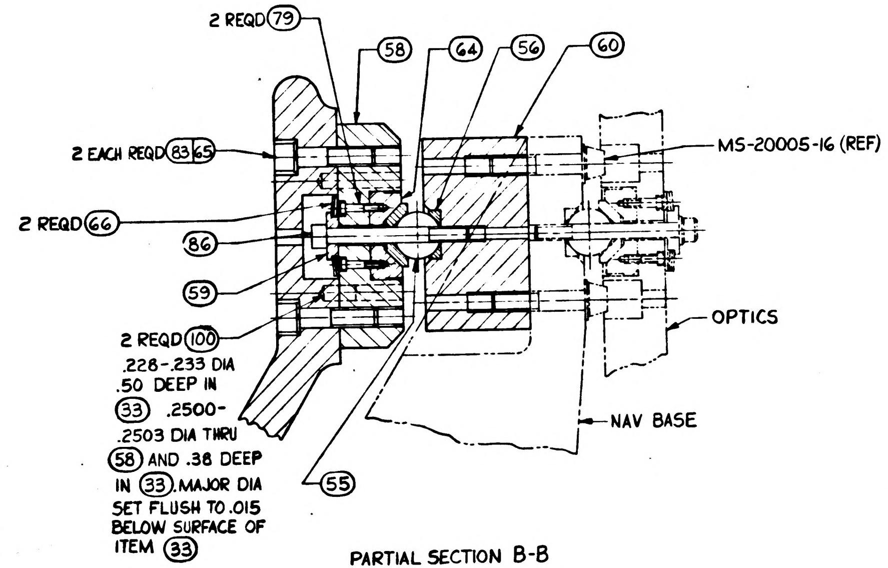
1900014

1900014 SH 1

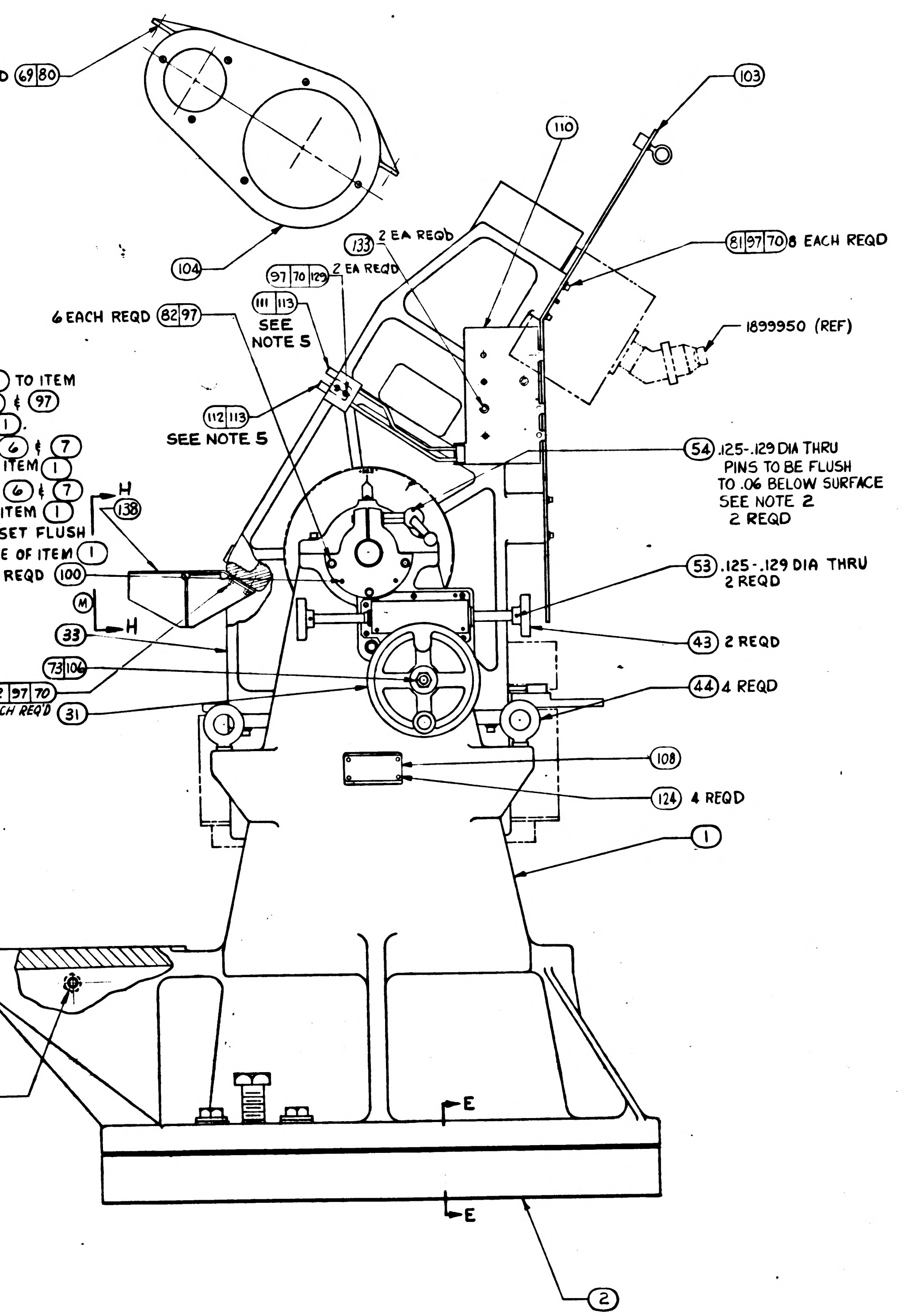
3/1900014

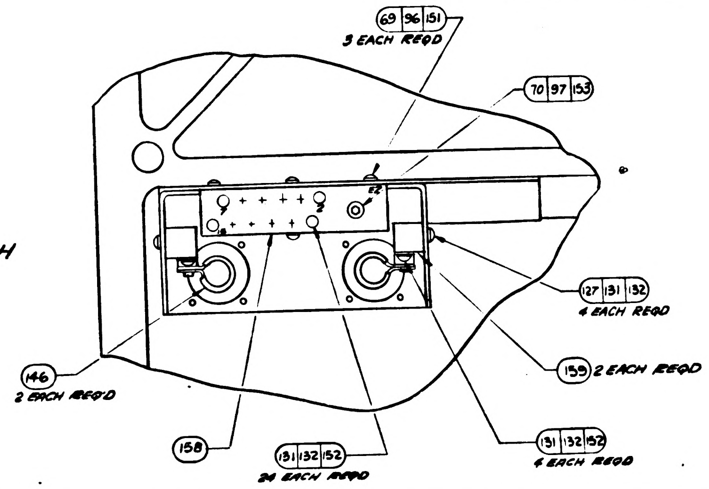

100 2 REQD
.228-233 DIA .50 DEEP
IN 33 .2500-.2503 DIA THRU 58 AND
.38 DEEP IN 33. MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 33
2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79
58
57
56
55
60
& EACH REQD

PARTIAL SECTION A-A
FULL SCALE


2 REQD 79
58
64
56
60
2 EACH REQD 83 65
MS-20005-16 (REF)
2 REQD 66
86
59
OPTICS
2 REQD 100
.228-.233 DIA
.50 DEEP IN
33 .2500-
.2503 DIA THRU
58 AND .38 DEEP
IN 33. MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM 33
NAV BASE
55

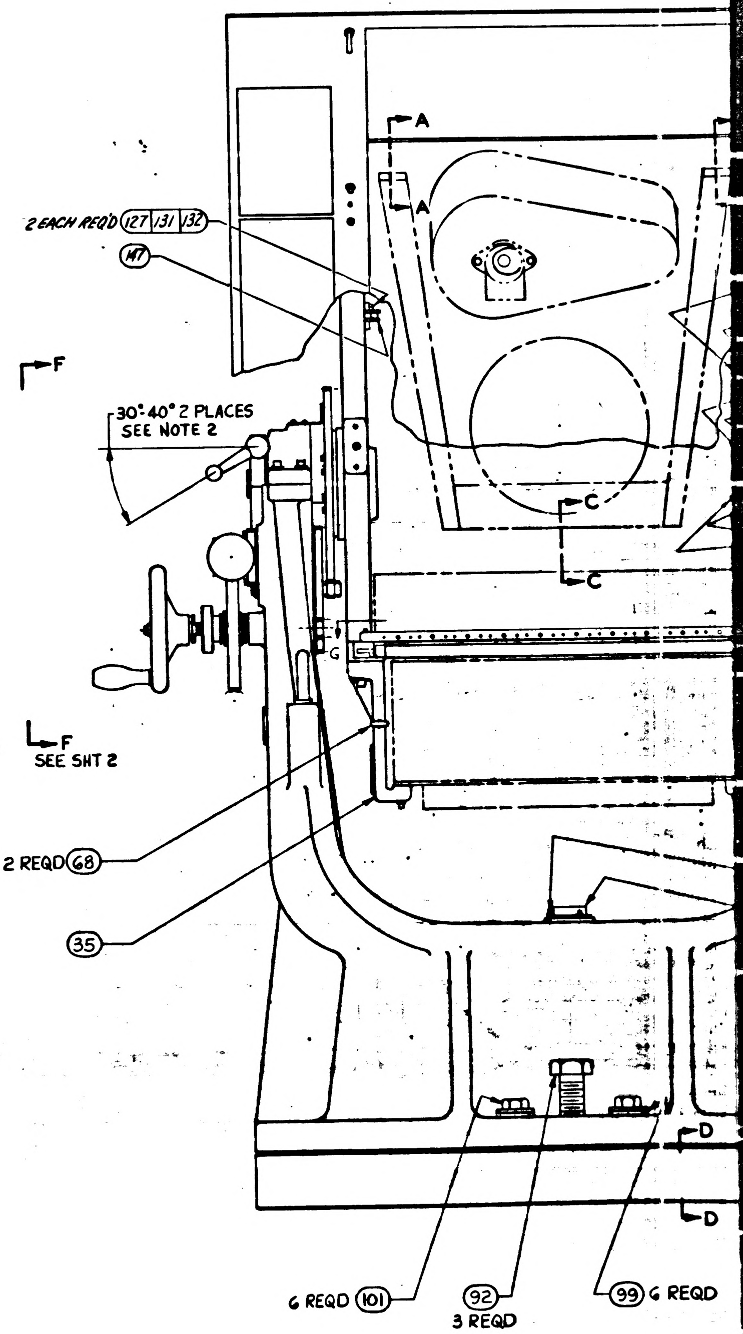
PARTIAL SECTION B-B
FULL SCALE


2 EACH REQD 69 80
104
103
110
133 2 EA REQD
97 70 129 2 EA REQD
81 97 70 8 EACH REQD
6 EACH REQD 82 97
111 113
SEE NOTE 5
1899950 (REF)
112 113
SEE NOTE 5
CLAMP ITEMS 6 & 7 TO ITEM
50, INSERT ITEMS 82 & 97
AND SECURE TO ITEM 1.
.228
.233 DIA THRU ITEMS 6 & 7
AND .50 DEEP IN ITEM 1
.2500
.2503 DIA THRU ITEMS 6 & 7
AND .38 DEEP IN ITEM 1
4 HOLES-MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 1
H
138
4 REQD 100
M
H
33
73 106
142 97 70
4 EACH REQ'D 31
54 .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
53 .125-.129 DIA THRU
2 REQD
43 2 REQD
44 4 REQD
108
124 4 REQD
1
M
70 97 98 156 157 154
E
E
2


69 96 151
3 EACH REQD
70 97 153
E2
127 131 132
4 EACH REQD
159 2 EACH REQD
146
2 EACH REQ'D
158
131 132 152
24 EACH REQD
131 132 152
4 EACH REQD

M

PARTIAL VIEW H-H
SCALE 1:2

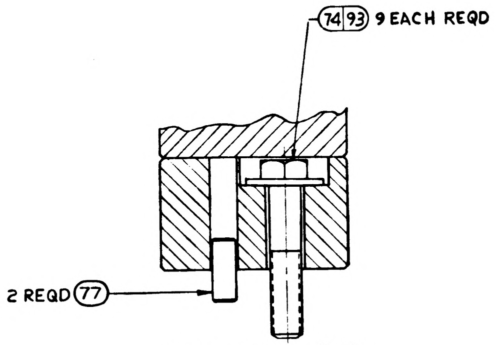

A
A
2 EACH REQ'D 127 131 132
147
F
30°-40° 2 PLACES
SEE NOTE 2
C
C
G
F
SEE SHT 2
2 REQD 68
35
D
D
6 REQD 101
92
3 REQD
99 6 REQD

NOTES:

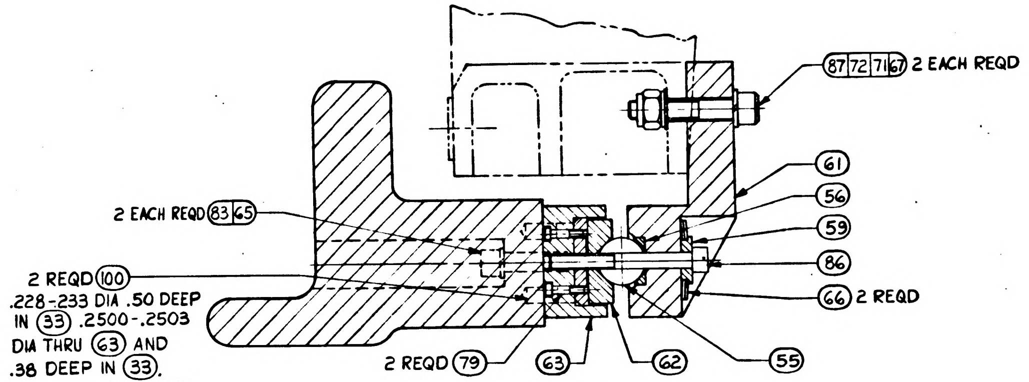
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. PIN ⑪ TO ⑧ OR ⑨ AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING
4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

QUAN.	ITEM NO
10	69
6	71
6	102
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144
4	155

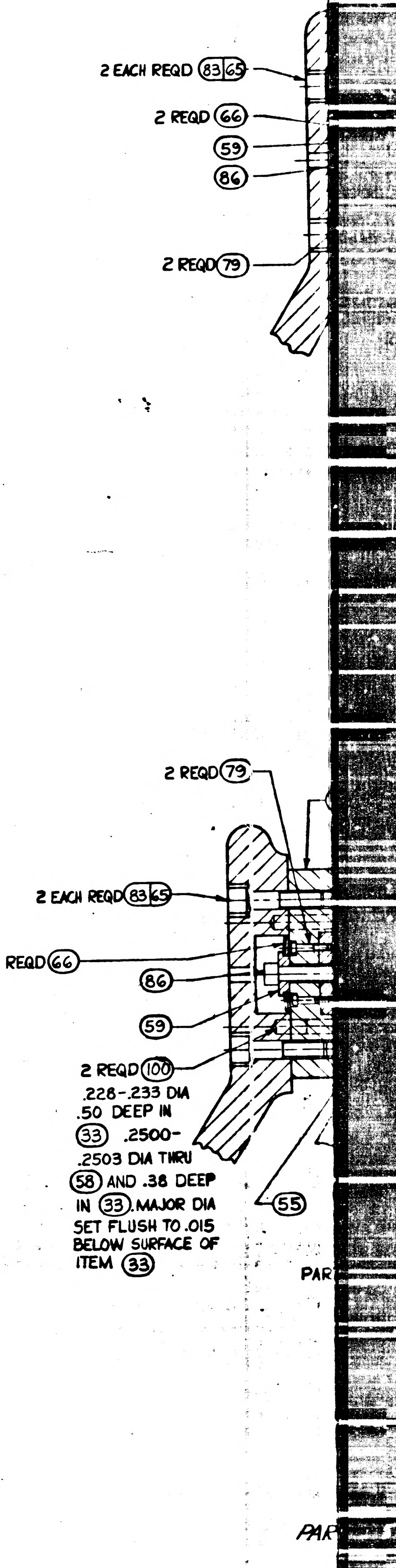
5. INSTALLATION OF QUICK DISCONNECT COUPLING HALVES.
   A. APPLY A THIN FILM OF DOW-CORNING LUBRICANT NO. 55 (MIL-L-4343A) TO ENTIRE SURFACE OF ITEM (113).
   B. INSTALL ITEM (111) AND (112) WITH A TORQUE OF 65-75 IN-LB.
6. APPLY A LIGHT COATING OF MIL-L-6085 OIL TO ALL SLIDING SURFACES OF PARTS INDICATED.

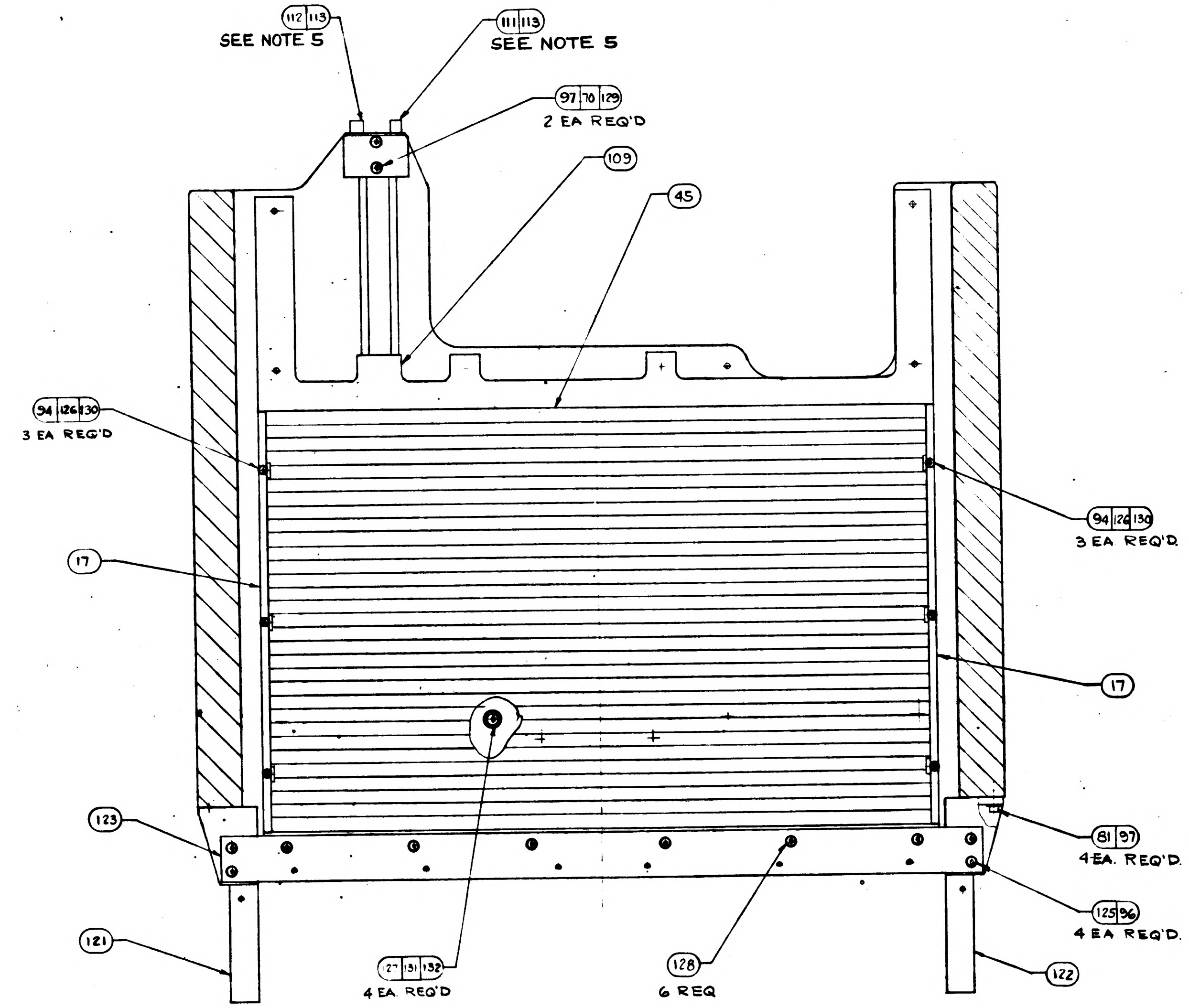

74 93 9 EACH REQD
2 REQD 77

PARTIAL SECTION D-D
SCALE 1:2

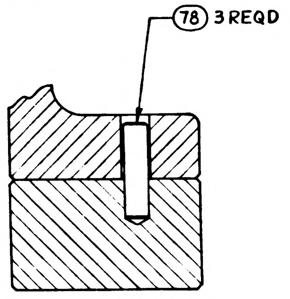

87 72 71 67 2 EACH REQD
2 EACH REQD 83 65
61
56
59
86
66 2 REQD
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 63 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
2 REQD 79
63
62
55

PARTIAL SECTION C-C
FULL SCALE


2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79
2 REQD 79
2 EACH REQD 83 65
2 REQD 66
86
59
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 58 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
55
PAR
PAR


112 113
SEE NOTE 5
111 113
SEE NOTE 5
97 70 129
2 EA REQ'D
109
45
94 126 130
3 EA REQ'D
94 126 130
3 EA REQ'D.
17
17
123
81 97
4 EA. REQ'D.
125 96
4 EA REQ'D.
121
127 131 132
4 EA. REQ'D
128
6 REQ
122

VIEW G-G
(SCALE 1:2)



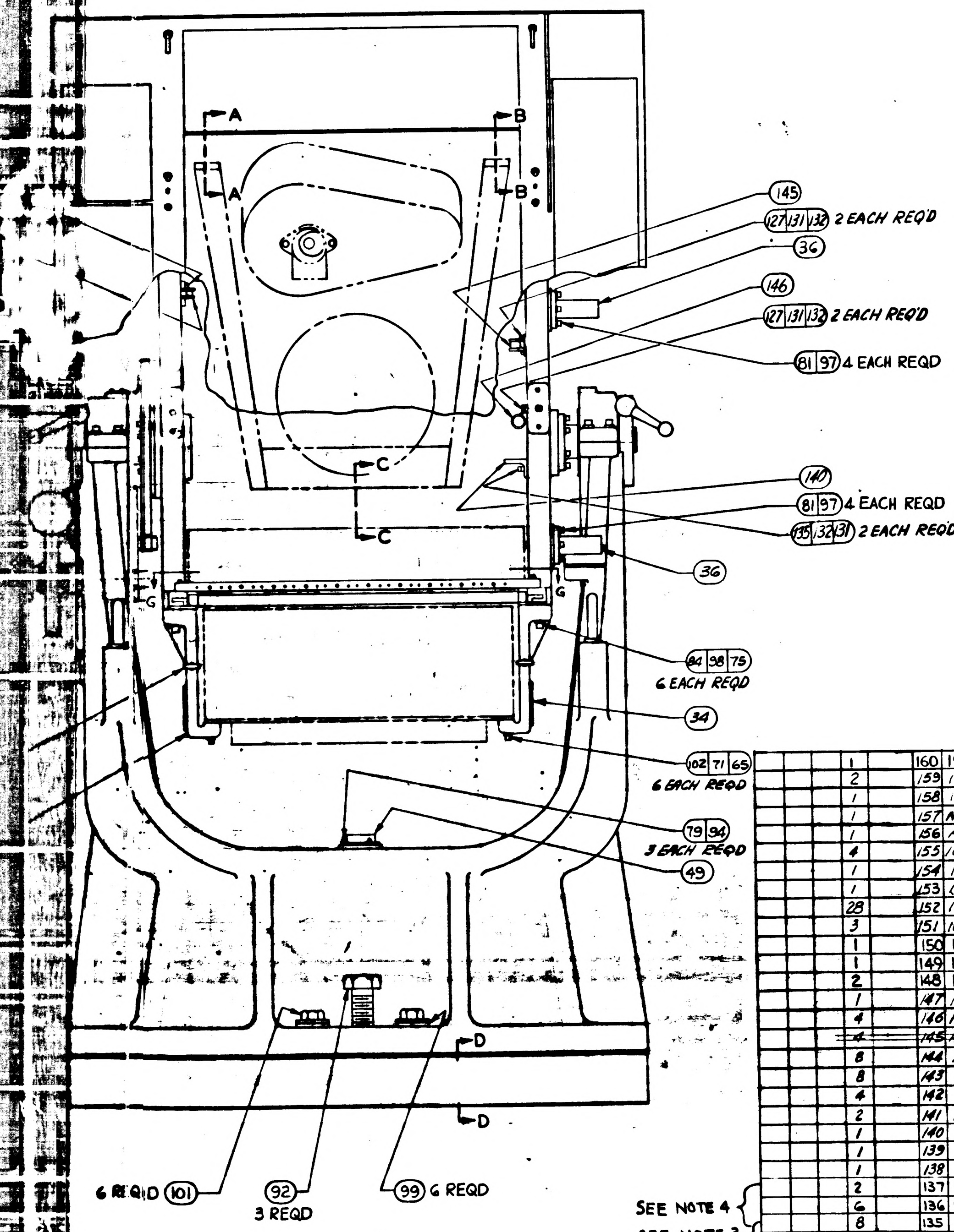
PARTIAL SECTION E-E
SCALE 1:2

1900014
AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION
MILWAUKEE, WISCONSIN

1900014	SH 1

MIL FORM 1050 J3

1/1900014



	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		133	1015831-249	SCREW-FLAT HD. HEX. SOC
	46		132	MS-35338-80	WASHER-LOCK
SEE NOTE 4	52		131	AN960-C-8L	(1897006-038) WASHER FLAT
	8		130	AN960-C-4	(1897006-024) WASHER FLAT
	4		129	MS-16995-55	SCREW-CAP
SEE NOTE 3	6		128	1015826-296	SCREW-FL. HD.
	14		127	1006783-27	SCREW-BUTTON HD
	8		126	1006783-20	SCREW, BUTTON HD.
	4		125	MS-16996-14	SCREW-CAP SOC. HD.
	4		124	AN535-0-4	SCREW-DRIVE
	1		123	1900874	CAP-TOE, GSE, PSA.
	1		122	1901348	BRACKET-SUPPORT R.H.
	1		121	1901347	BRACKET-SUPPORT L.H.
	1		120	1900939	PINION-CHANGE GEAR
	1		119	1900938	WASHER
	1		118	1900937	WASHER-STEP
	1		117	1900936	SPACER
	1		116	MS-16624-4075	RING-RETAINING
	1		115	1900940	BUSHING-COMPOUND
	1		114	1900935	WASHER-FLAT
SEE NOTE 3	4		113	1000159-6	PACKING, PREFORMED O-RING
	2		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
	2		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
	1		110	1900850	COLDPLATE, CDU (INSEP. ASS'Y)
	1		109	1900819	COLDPLATE, PSA, (INSEP. ASS'Y)
	1		108	1901304-211	PLATE, IDENTIFICATION
	12		107	AN960C6L	(1897006-036 WASHER-FLAT
	1		106	NAS1408C8	(1896868-108) NUT-SELF LOCKING
SEE NOTE 4	6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
	1		104	1900590	GUARD AND SEAL ASSY
	1		103	1900552	RACK
SEE NOTE 4	12		102	MS-16995-68	SCREW, HEX SOC
	6		101	MS35305-240	SCREW, CAP
SEE NOTE 3	14		100	1016093-001	PIN-STEP DOWEL
	6		99	1016095-007	WASHER-SPHERICAL
	7		98	MS35338-84	WASHER-LOCK, SPLIT
	61		97	MS35338-82	WASHER-LOCK, SPLIT
	33		96	MS35338-81	WASHER-LOCK, SPLIT
	4		95	MS35338-79	WASHER-LOCK, SPLIT
	11		94	MS35338-78	WASHER-LOCK, SPLIT
	9		93	MS35305-242	SCREW, CAP
	3		92	MS35300-316	SCREW, CAP
	4		91	MS35216-25	SCREW, MACHINE, PAN HD
	1		90	MS24692-162	PIN-TAPER
	1		89	MS24692-189	PIN-TAPER
	2		88	MS24692-108	PIN-TAPER
	2		87	MS16998-62	SCREW-HEX SOC
	3		86	MS16998-50	SCREW-HEX SOC
	24		85	MS16996-12	SCREW, CAP
	6		84	MS16995-84	SCREW, CAP
	6		83	MS16995-67	SCREW, CAP
	24		82	MS16995-53	SCREW, CAP
	27		81	MS16995-52	SCREW, CAP
	4		80	MS16995-37	SCREW, CAP
	9		79	MS16995-11	SCREW, CAP
	3		78	MS16556-104	PIN-STRAIGHT
	2		77	MS16556-101	PIN-STRAIGHT
	4		76	MS16555-648	PIN-STRAIGHT
	6		75	MS15795-315	WASHER, FLAT
	9		74	MS15795-126	WASHER, FLAT
	3		73	AN960C816	(1897006-082) WASHER-FLAT
	2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
SEE NOTE 4	14		71	AN960C516	(1897006-052) WASHER-FLAT
	18		70	AN960C416	(1897006-042) WASHER-FLAT
SEE NOTE 4	17		69	AN960C10	(1897006-017) WASHER-FLAT
SEE NOTE 3	2		68	1015916-001	BOLT-EYE
	2		67	NAS70V328-563	WASHER-FIBRE
	6		66	1899979	WASHER-BELLEVILLE
	12		65	MS-35338-83	WASHER-LOCK
	1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
	1		63	1900581	PAD
	1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
	1		61	1900580	MOUNT-BALL
	2		60	1900583	SPACER-BALL MOUNT
	3		59	1900962	COLLAR-CENTERING
	2		58	1900582	PAD
	1		57	1900968	INSERT-BALL MOUNT. STAT.
	3		56	1900972	INSERT
	3		55	1900963	BALL-PRECISION
	2		54	MS-171537	PIN-SPRING
	2		53	MS-171536	PIN-SPRING
	1		52	MS-24585-C499	1897067-499) SPRING
	1		51	MS171600	PIN, SPRING
	2		50	1900624	SHAFT-TRUNNION
SEE NOTE 3	1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
	1		48	MS-16624-4075	RING, RETAINING
	~~2~~		~~47~~	~~1901622-002~~	~~BEARING THRUST~~
	1		46	MS-17796-112	BEARING-SLEEVE
	1		45	1901369	PAD, THERMAL INTERFACE
SEE NOTE 3	4		44	1015916-003	BOLT-EYE
	2		43	1900632	KNOB, FINE ADJUST
	~~2~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
	1		41	MS-17796-89	BEARING, SLEEVE
	~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		160	1901687	PLATE-INSTRUCTION
	2		159	1901673	BLOCK-SUPPORT, CLAMP
	1		158	1901672	BUS BAR
	1		157	MS35690-410	NUT-HEX, PLAIN
	1		156	AN960C616	(1897006-062) WASHER-FLAT
	4		155	1006783-47	SCREW-BUTTON HD., HEX SOC.
	1		154	1901685	STUD-GROUND
	1		153	1006783-51	SCREW-BUTTON HD., HEX SOC.
	28		152	1006783-26	SCREW-BUTTON HD., HEX SOC.
	3		151	1006783-44	SCREW-BUTTON HD, HEX SOC.
	1		150	1901667-001	WASHER, THRUST
	1		149	1901668-001	WASHER, THRUST
	2		148	MS171493	PIN, ROLL
	1		147	1010400-1	CLAMP-LOOP HINGED
	4		146	1010400-3	CLAMP-LOOP HINGED
	~~4~~		~~145~~	~~AN363C832~~	~~(1896990-281) NUT-SELF LOCKING~~
	8		144	AN363C632	(1896990-261) NUT-SELF LOCKING
	8		143	1006783-23	SCREW-BUTTON HD. HEX SOC.
	4		142	MS16995-50	SCREW-CAP
	2		141	MS16995-28	SCREW-CAP
	1		140	1901650	BRACKET-CONN., ELEC
	1		139	1901643	GUARD-HARNESS
	1		138	1901639	BRACKET-CONN., ELEC.
	2		137	1901594	SCREW-SHOULDER
SEE NOTE 4	6		136	MS-16996-16	SCREW-CAP
SEE NOTE 3	8		135	1006783-29	SCREW-BUTTON HD. HEX. SOC.

LIST OF PARTS AND MATERIALS

P	L
N	L
M	L
L	L
K	K
J	J
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

H	E
G	E
F	E
E	E
D	C
C	C
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 07095	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN 64	MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDRR 07455		13 JAN 64	MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 TDRR 07456		13 JAN 64	JJ MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 TDRR 07457		3 FEB 64	MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR 07458		26 FEB 64	
J		CHANGE IN ACCORDANCE WITH CM 196276 TDRR 09224		23 APR 64	J.C. PJ
K		CHANGE IN ACCORDANCE WITH CM-196929 PER TDRR 09225		13 MAY 64	BK
L		CHANGE IN ACCORDANCE WITH CM 197337		22 MAY 64	EM
M		CHANGE IN ACCORDANCE WITH CM 197475		11 JUNE 64	BK RWB
N		CHANGE IN ACCORDANCE WITH CM 197506		16 JUNE 64	BK RWB
P		CHANGE IN ACCORDANCE WITH CM 197639 11552		23 JUNE 64	DGS RWB

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 DATE 28 Aug 63

Ⓒ REPLACES REV "B" WITH CHANGE

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		39	MS-172211	WASHER, KEY, BEARING RETAINING
	2		38	MS-172246	NUT, SPANNER
	2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
	2		36	1900571	SHAFT, STOP
	1		35	1900716	BRACKET, MOUNTING (L.H.)
	1		34	1900715	BRACKET, MOUNTING (R.H.)
	1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
	1		32	1900776	WORM R.H.
	1		31	1900724	HANDWHEEL
	1		30	1900723	WASHER
	1		29	1900722	GEAR, INTERMEDIATE
	1		28	1900721	GUIDE, SPRING
	1		27	1900720	WASHER, SPRING
	1		26	1900647	PINION
	1		25	1900646	COVER-WORM
	1		24	1900645	SHIM, LAMINATED
	1		23	1900644	BRACKET, WORM
	1		22	1900643	SHAFT, WORM, FINE ADJUST
	1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
	1		20	1900641	WASHER, THRUST
	1		19	1900640	GEAR-WORM R.H.
	1		18	1900639	SHAFT, COARSE ADJUST
	2		17	1901370	CLAMP, THERMAL INTERFACE MATL
	1		16	1900637	SHAFT, GEAR
	1		15	1900636	POINTER-INDEX
	1		14	1900635	GEAR-OUTPUT
	1		13	1900634	CAP, BEARING
	1		12	1900633	CAP, BEARING
	2		11	1900725	LEVER, SHAFT LOCK
	1		10	1900631	WASHER, THRUST
	1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
	1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
	1		7	1900629	LOCK-SHAFT (L.H.)
	1		6	1900628	LOCK-SHAFT (R.H.)
	1		5	1900627	RETAINER, BEARING
	1		4	1900626	RETAINER, BEARING
	2		3	1900625	CARTRIDGE, BEARING
	1		2	1900622	RING-BASE
	1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED 16 SEP 63
APPROVAL 17 SEP 63
APPROVAL 10/ /63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

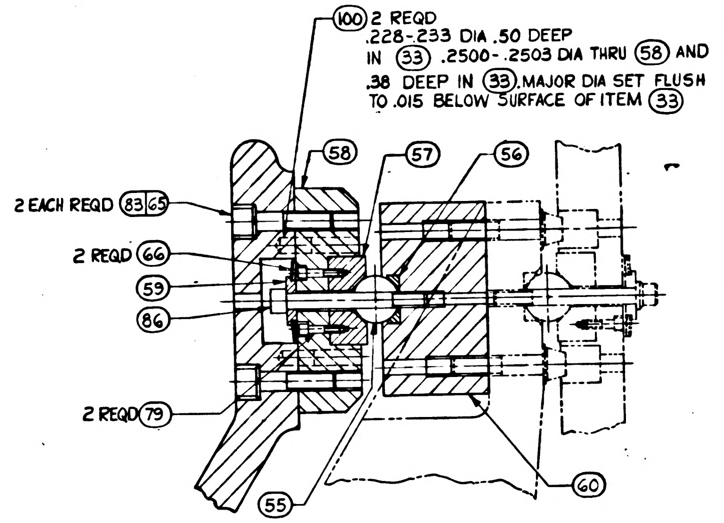
G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO.
SIZE J3
1900014
SCALE 1:4
SHEET 1 OF 2

1900014 SH 1

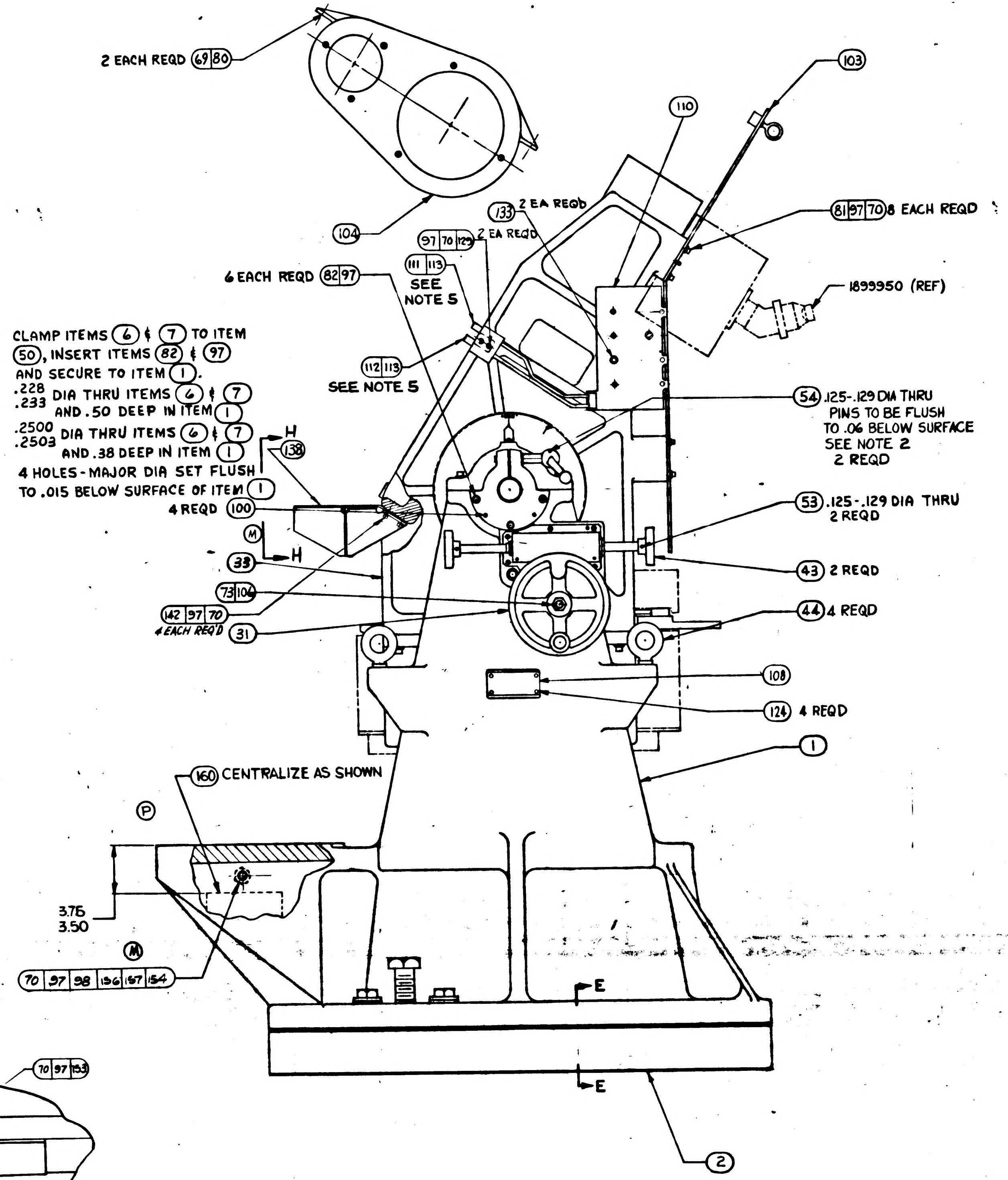
P 1900014

3/1900014

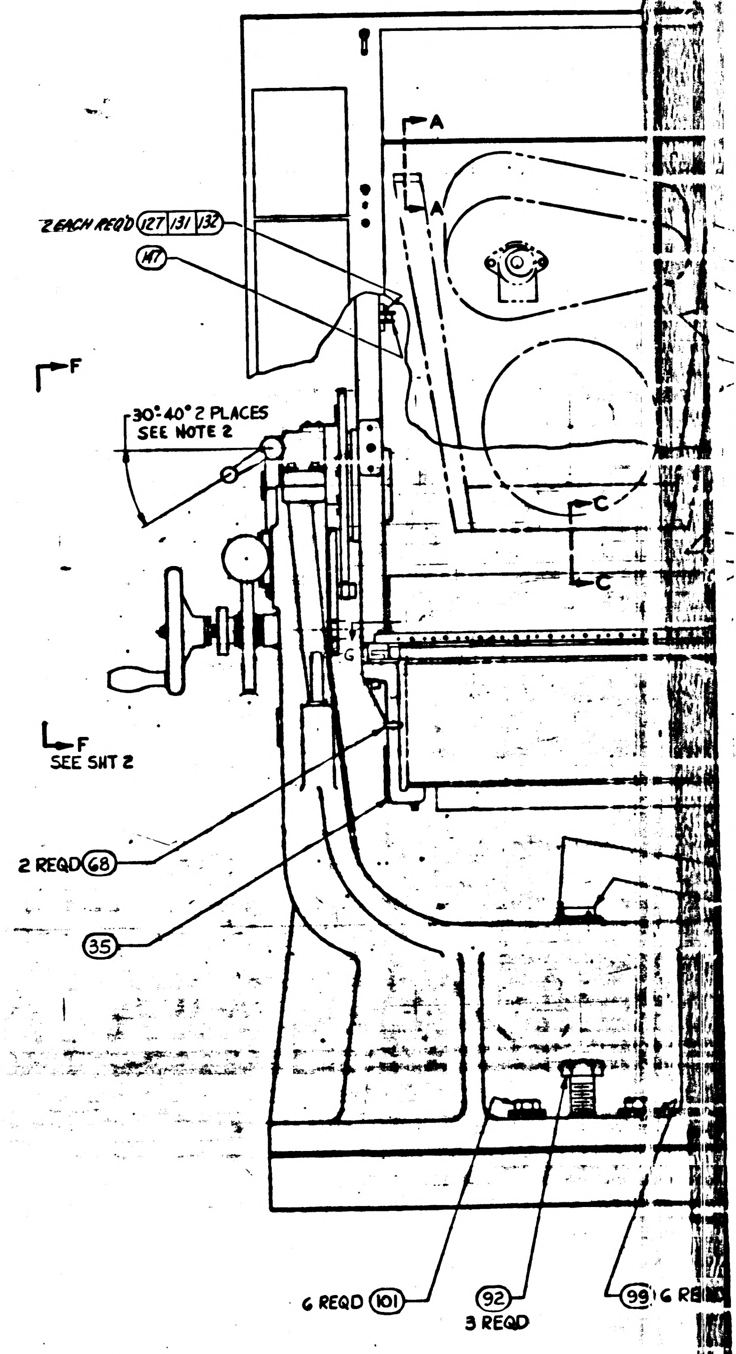


100 2 REQD
.228-.233 DIA .50 DEEP
IN 33 .2500-.2503 DIA THRU 58 AND
.38 DEEP IN 33. MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 33
CH REQD
2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79
58
57
56
55
60

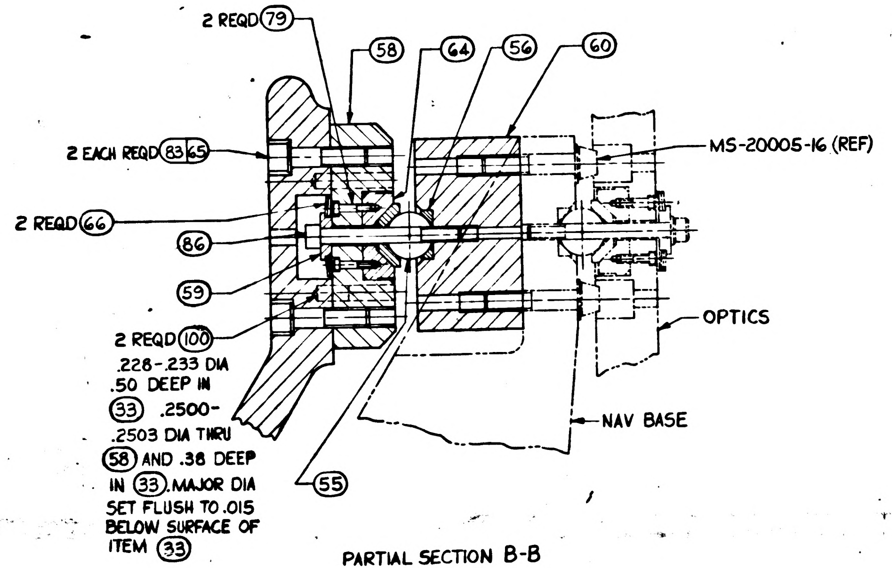
PARTIAL SECTION A-A
FULL SCALE



2 EACH REQD 69 80
104
103
110
133 2 EA REQD
97 70 129 2 EA REQD
81 97 70 8 EACH REQD
111 113
SEE NOTE 5
6 EACH REQD 82 97
112 113
SEE NOTE 5
1899950 (REF)
CLAMP ITEMS 6 & 7 TO ITEM
50, INSERT ITEMS 82 & 97
AND SECURE TO ITEM 1.
.228
.233 DIA THRU ITEMS 6 & 7
AND .50 DEEP IN ITEM 1
.2500
.2503 DIA THRU ITEMS 6 & 7
AND .38 DEEP IN ITEM 1
4 HOLES-MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 1
H
138
4 REQD 100
M
33
H
73 106
142 97 70
4 EACH REQD
31
54 .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
53 .125-.129 DIA THRU
2 REQD
43 2 REQD
44 4 REQD
108
124 4 REQD
1
160 CENTRALIZE AS SHOWN
P
3.76
3.50
M
70 97 98 136 137 154
E
E
2

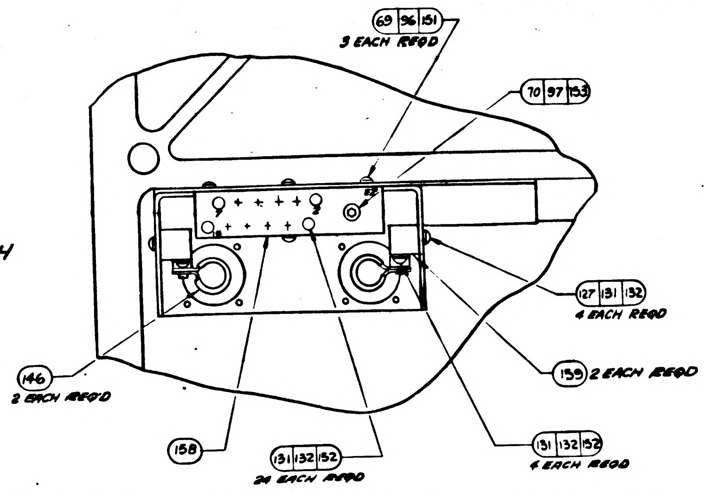


A
A
2 EACH REQD 127 131 132
147
F
30°-40° 2 PLACES
SEE NOTE 2
C
C
F
SEE SHT 2
2 REQD 68
35
6 REQD 101
92
3 REQD
99 6 RE



2 REQD 79
58
64
56
60
2 EACH REQD 83 65
MS-20005-16 (REF)
2 REQD 66
86
59
OPTICS
2 REQD 100
.228-.233 DIA
.50 DEEP IN
33 .2500-
.2503 DIA THRU
58 AND .38 DEEP
IN 33. MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM 33
NAV BASE
55

PARTIAL SECTION B-B
FULL SCALE



69 96 151
3 EACH REQD
70 97 153
127 131 132
4 EACH REQD
159 2 EACH REQD
146
2 EACH REQD
158
131 132 152
24 EACH REQD
131 132 152
4 EACH REQD
M

PARTIAL VIEW H-H
SCALE 1:2

1900014

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. PIN ⑪ TO ⑧ OR ⑨ AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.

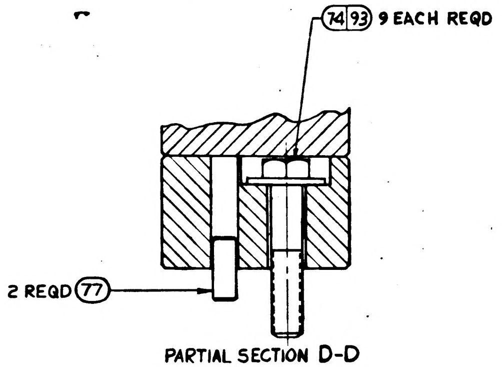
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

QUAN.	ITEM NO
10	69
6	71
6	102
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144
4	155

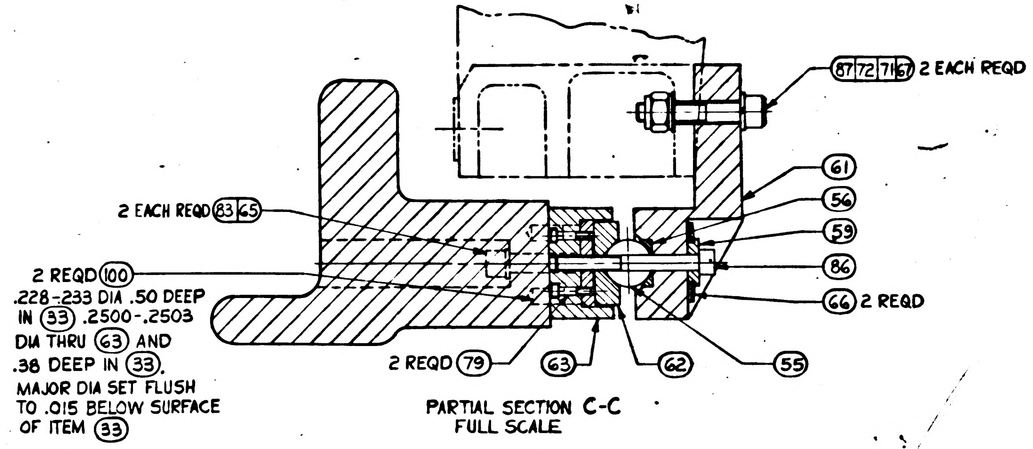
5. INSTALLATION OF QUICK DISCONNECT COUPLING HALVES.
   A. APPLY A THIN FILM OF DOW-CORNING LUBRICANT NO. 55 (MIL-L-4343A) TO ENTIRE SURFACE OF ITEM (113).
   B. INSTALL ITEM (111) AND (112) WITH A TORQUE OF 65-75 IN-LB.

6. APPLY A LIGHT COATING OF MIL-L-6085 OIL TO ALL SLIDING SURFACES OF PARTS INDICATED.



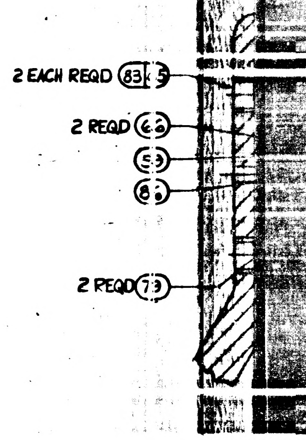
74 93 9 EACH REQD
2 REQD 77

PARTIAL SECTION D-D
SCALE 1:2

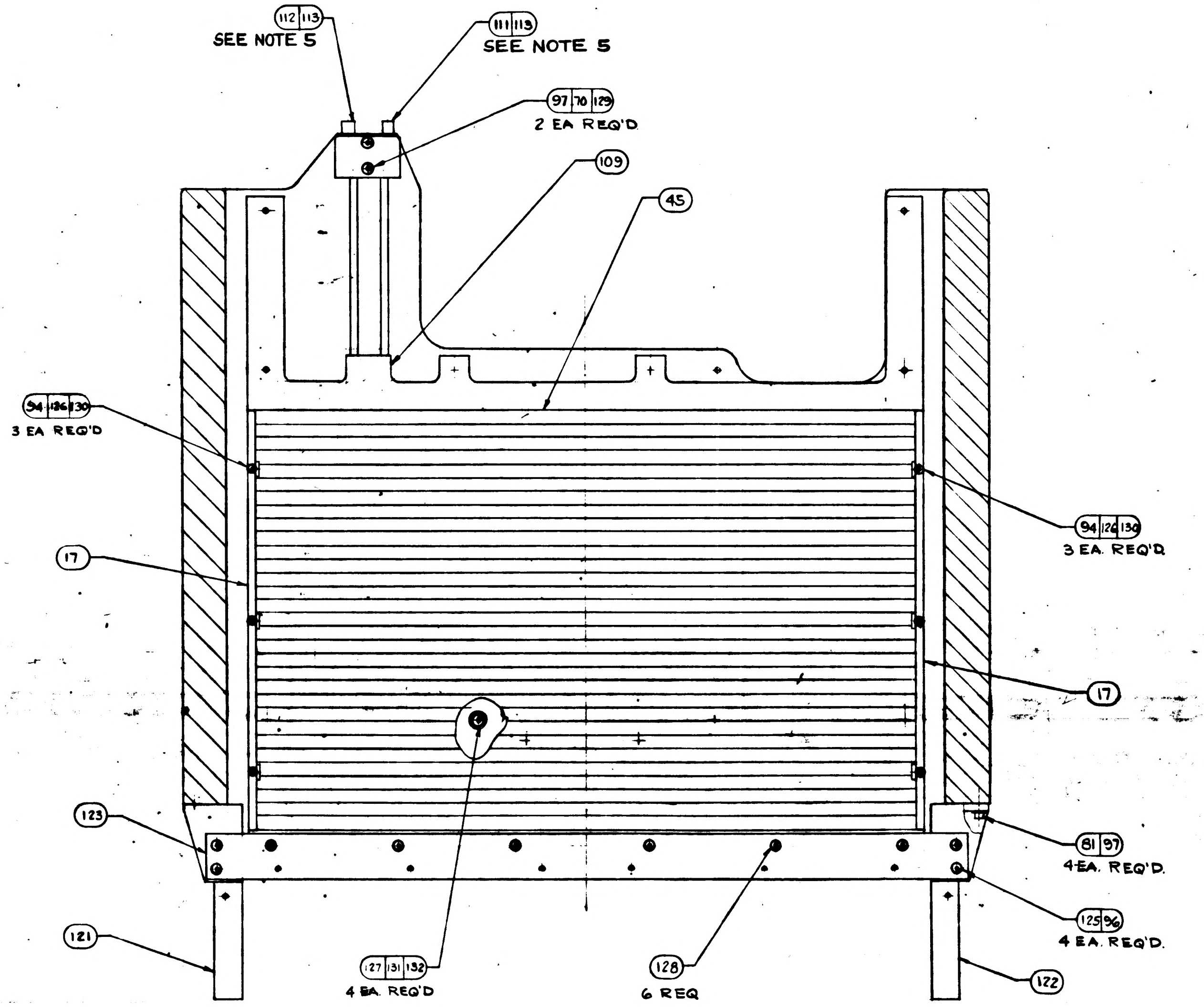


87 72 71 67 2 EACH REQD
61
56
59
86
66 2 REQD
2 EACH REQD 83 65
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 63 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
2 REQD 79
63
62
55

PARTIAL SECTION C-C
FULL SCALE

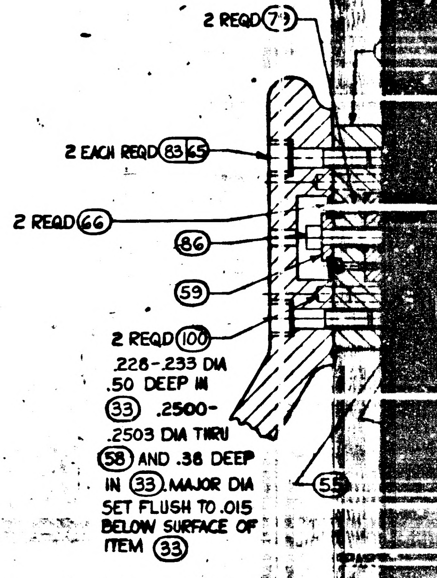


2 EACH REQD 83
2 REQD
2 REQD

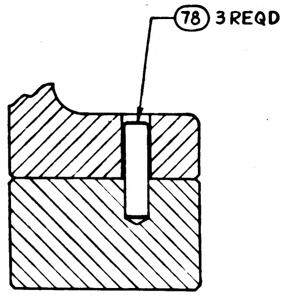


112 113
SEE NOTE 5
111 113
SEE NOTE 5
97 70 129
2 EA REQ'D
109
45
94 126 130
3 EA REQ'D
94 126 130
3 EA. REQ'D
17
17
123
81 97
4 EA. REQ'D.
125 96
4 EA. REQ'D.
121
127 131 132
4 EA. REQ'D
128
6 REQ
122

VIEW G-G
(SCALE 1:2)



2 REQD 79
2 EACH REQD 83 65
2 REQD 66
86
59
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 58 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
55



PARTIAL SECTION E-E
SCALE 1:2

1900014 SH 1

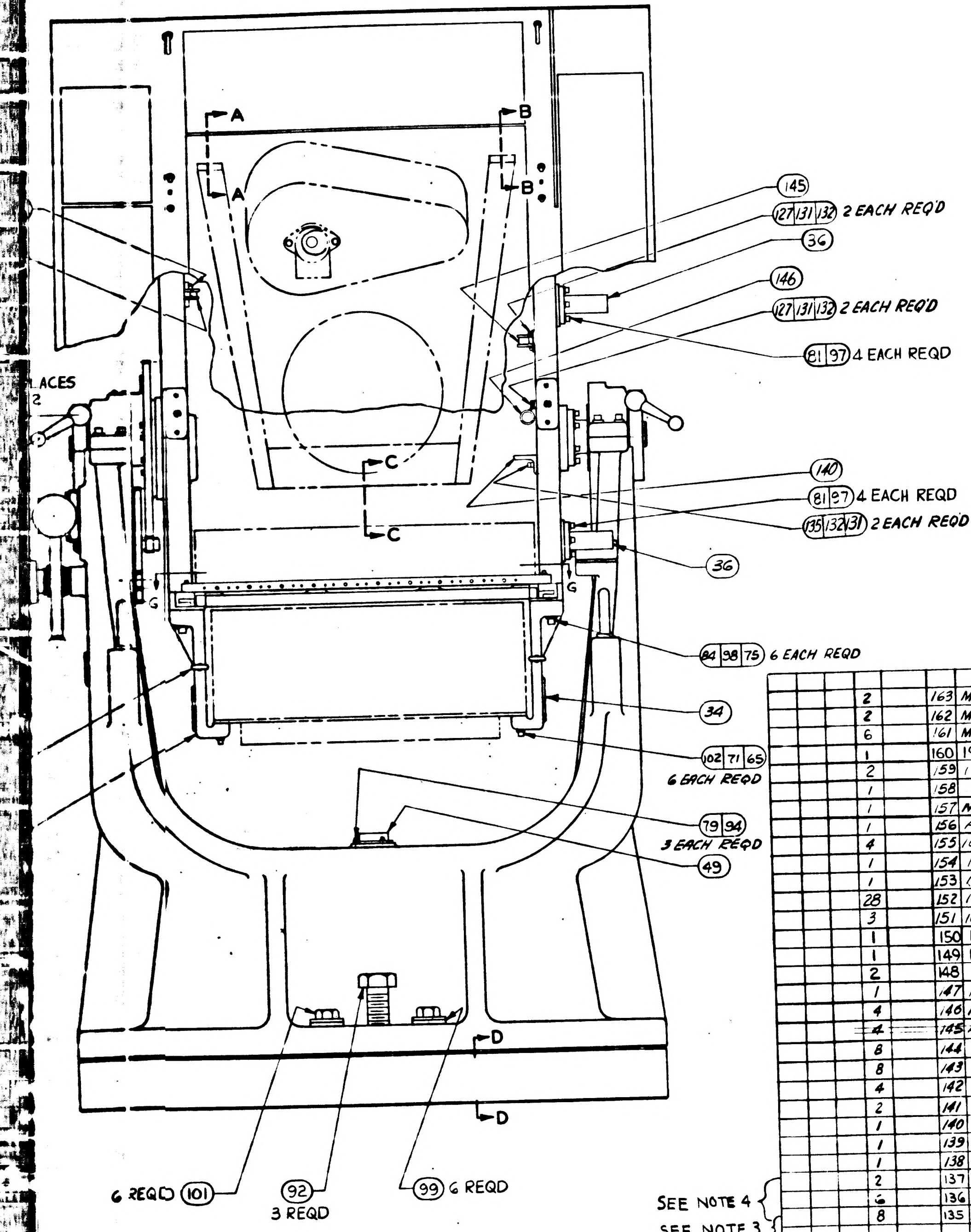
REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APP'D
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 04045	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN 64	K.J.W. MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDRR 07455		13 JAN 63	K.J.W. MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 TDRR 07456		13 JAN 64	JJ MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 TDRR 07457		3 FEB 64	K.J.W. MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR [illegible]		26 FEB 64	W.L.
J		CHANGE IN ACCORDANCE WITH CM 196276 TDRR 09224		23 APR 64	J.C. PJ
K		CHANGE IN ACCORDANCE WITH CM-196929 PER TDRR 09225		5 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CM 197337 PER TDRR 10823		22 MAY 64	EM
M		CHANGE IN ACCORDANCE WITH CM 197475 PER TDRR 10824		11 JUNE 64	BK
N		CHANGE IN ACCORDANCE WITH CM 197506 PER TDRR [illegible]		16 JUNE 64	BK RWK
P		CHANGE IN ACCORDANCE WITH CM 197639 TDRR 11552		23 JUNE 64	DGS RWK
R		CHANGE IN ACCORDANCE WITH CM 199763 REVISED PER TDRR 14931		2 SEP 64	JC PJ

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02786 DATE

Ⓒ REPLACES REV "B" WITH CHANGE



LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED (011)	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
2	163	MS16998-60	SCREW, HEX SOC	
2	162	MS16995-54	SCREW, HEX SOC.	
6	161	MS16995-67	SCREW, HEX SOC	
1	160	1901687	PLATE-INSTRUCTION	
2	159	1901673	BLOCK-SUPPORT, CLAMP	
1	158	901672	BUS BAR	
1	157	MS35690-410	NUT-HEX PLAIN	
1	156	AN960C616	(1897006-062) WASHER-FLAT	
4	155	1006783-47	SCREW-BUTTON HD., HEX SOC.	
1	154	1901685	STUD-GROUND	
1	153	1006783-51	SCREW-BUTTON HD., HEX SOC.	
28	152	1006783-26	SCREW-BUTTON HD., HEX SOC.	
3	151	1006783-44	SCREW-BUTTON HD, HEX SOC.	
1	150	1901667-001	WASHER, THRUST	
1	149	1901668-001	WASHER, THRUST	
2	148	MS171493	PIN, ROLL	
1	147	1010400-1	CLAMP-LOOP HINGED	
4	146	1010400-3	CLAMP-LOOP HINGED	
~~4~~	145	AN363C832	(1896990-281) NUT-SELF LOCKING	
8	144	AN363C632	(1896990-261) NUT-SELF LOCKING	
8	143	1006783-23	SCREW-BUTTON HD HEX SOC.	
4	142	MS16995-50	SCREW-CAP	
2	141	MS16995-28	SCREW-CAP	
1	140	1901650	BRACKET-CONN., ELEC	
1	139	1901643	GUARD-HARNESS	
1	138	1901639	BRACKET-CONN., ELEC.	
2	137	1901594	SCREW-SHOULDER	
6	136	MS-16996-16	SCREW-CAP	SEE NOTE 4
8	135	1006783-29	SCREW-BUTTON HD. HEX. SOC.	SEE NOTE 3

QUANTITY REQUIRED (011)	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
2	133	1015831-249	SCREW-FLAT HD. HEX. SOC	
46	132	MS-35338-80	WASHER-LOCK	
52	131	AN960C8L	(1897006-038) WASHER FLAT	SEE NOTE 4
8	130	AN960C4	(1897006-024) WASHER FLAT	
2	129	MS-16995-55	SCREW-CAP	
6	128	1015826-296	SCREW-FL. HD.	
14	127	1006783-27	SCREW-BUTTON HD	SEE NOTE 3
8	126	1006783-20	SCREW, BUTTON HD.	
4	125	MS-16996-14	SCREW-CAP SOC. HD.	
4	124	AN535-0-4	SCREW-DRIVE	
1	123	1900874	CAP-TOE, GSE, PSA	
1	122	1901348	BRACKET-SUPPORT R.H.	
1	121	1901347	BRACKET-SUPPORT L.H.	
1	120	1900939	PINION-CHANGE GEAR	
1	119	1900938	WASHER	
1	118	1900937	WASHER-STEP	
1	117	1900936	SPACER	
1	116	MS-16624-4075	RING-RETAINING	
1	115	1900940	BUSHING-COMPOUND	
1	114	1900935	WASHER-FLAT	
4	113	1000159-6	PACKING, PREFORMED O-RING	
2	112	1016019-004	COUPLING HALF, QUICK-DISCONNECT	SEE NOTE 3
2	111	1016238-001	COUPLING HALF, QUICK-DISCONNECT	
1	110	1900850	COLDPLATE, CDU (INSEP. ASS'Y)	
1	109	1901821	COLDPLATE, PSA, TYPE 014 (INSEP ASSY)	GFP
1	108	1901304-211	PLATE, IDENTIFICATION	
12	107	AN960C6L	(1897006-036 WASHER-FLAT	
1	106	NAS1408C8	(1896868-108) NUT-SELF LOCKING	
6	105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.	SEE NOTE 4
1	104	1900590	GUARD AND SEAL ASSY	
1	103	1900552	RACK	
6	102	MS-16995-68	SCREW, HEX SOC	SEE NOTE 4
6	101	MS35305-240	SCREW, CAP	
14	100	1016093-001	PIN-STEP DOWEL	
6	99	1016095-007	WASHER-SPHERICAL	SEE NOTE 3
7	98	MS35338-84	WASHER-LOCK, SPLIT	
61	97	MS35338-82	WASHER-LOCK, SPLIT	
33	96	MS35338-81	WASHER LOCK, SPLIT	
4	95	MS35338-79	WASHER-LOCK, SPLIT	
11	94	MS35338-78	WASHER-LOCK, SPLIT	
9	93	MS35305-242	SCREW, CAP	
3	92	MS35300-316	SCREW, CAP	
4	91	MS35216-25	SCREW, MACHINE, PAN HD	
1	90	MS24692-162	PIN-TAPER	
1	89	MS24692-189	PIN-TAPER	
2	88	MS24692-108	PIN-TAPER	
~~2~~	~~87~~	~~MS16998-62~~	~~SCREW-HEX SOC~~	
3	86	MS16998-50	SCREW-HEX SOC	
24	85	MS16996-12	SCREW, CAP	
6	84	MS16995-84	SCREW, CAP	
6	83	MS16995-67	SCREW, CAP	
24	82	MS16995-53	SCREW, CAP	
27	81	MS16995-52	SCREW, CAP	
4	80	MS16995-37	SCREW, CAP	
9	79	MS16995-11	SCREW, CAP	
3	78	MS16556-104	PIN-STRAIGHT	
2	77	MS16556-101	PIN-STRAIGHT	
4	76	MS16555-648	PIN-STRAIGHT	
6	75	MS15795-315	WASHER, FLAT	
9	74	MS15795-126	WASHER, FLAT	
3	73	AN960C816	(1897006-082) WASHER-FLAT	
2	72	AN363C524	(1896990-051) NUT-SELF LOCKING	
14	71	AN960C516	(1897006-052) WASHER-FLAT	SEE NOTE 4
18	70	AN960C416	(1897006-042) WASHER-FLAT	
17	69	AN960C10	(1897006-017) WASHER-FLAT	SEE NOTE 4
2	68	1015916-001	BOLT-EYE	SEE NOTE 3
2	67	NAS70V328-563	WASHER-FIBRE	
6	66	1899979	WASHER-BELLEVILLE	
12	65	MS-35338-83	WASHER-LOCK	
1	64	1900970-011	INSERT-BALL MOUNT ASSY, LINE	
1	63	1900581	PAD	
1	62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE	
1	61	1900580	MOUNT-BALL	
2	60	1900583	SPACER-BALL MOUNT	
3	59	1900962	COLLAR-CENTERING	
2	58	1900582	PAD	
1	57	1900968	INSERT-BALL MOUNT. STAT.	
3	56	1900972	INSERT	
3	55	1900963	BALL-PRECISION	
2	54	MS-171537	PIN-SPRING	
2	53	MS-171536	PIN-SPRING	
1	52	MS-24585-C499	(1897067-499) SPRING	
1	51	MS171600	PIN, SPRING	
2	50	1900624	SHAFT-TRUNNION	
1	49	1016129-010	LEVEL-CIRCULAR MOUNTED	SEE NOTE 3
1	48	MS-16624-4075	RING, RETAINING	
~~2~~	~~47~~	~~1901622-002~~	~~BEARING THRUST~~	
1	46	MS-17796-112	BEARING-SLEEVE	
	45	1901369	PAD, THERMAL INTERFACE	
4	44	1015916-003	BOLT-EYE	SEE NOTE 3
2	43	1900632	KNOB, FINE ADJUST	
~~1~~	42	~~MS-17796-98~~	~~BEARING, SLEEVE~~	
1	41	MS-17796-89	BEARING, SLEEVE	
~~1~~	40	~~MS-17796-[illegible]~~	~~BEARING SLEEVE~~	

QUANTITY REQUIRED (011)	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	39	MS-172211	WASHER, KEY, BEARING RETAINING
2	38	MS-172246	NUT, SPANNER
2	37	1016083-001	BEARING-BALL, DUPLEX PAIR
2	36	1900571	SHAFT, STOP
1	35	1900716	BRACKET, MOUNTING (L.H.)
1	34	1900715	BRACKET, MOUNTING (R.H.)
1	33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
1	32	1900776	WORM R.H.
1	31	1900724	HANDWHEEL
1	30	1900723	WASHER
1	29	1900722	GEAR, INTERMEDIATE
1	28	1900721	GUIDE, SPRING
1	27	1900720	WASHER, SPRING
1	26	1900647	PINION
1	25	1900646	COVER-WORM
1	24	1900645	SHIM, LAMINATED
1	23	1900644	BRACKET, WORM
1	22	1900643	SHAFT, WORM, FINE ADJUST
1	21	1900642	KNOB (INSEPARABLE) ASSEMBLY
1	20	1900641	WASHER, THRUST
1	19	1900640	GEAR-WORM R.H.
1	18	1900639	SHAFT, COARSE ADJUST
2	17	1901370	CLAMP THERMAL INTERFACE MATL
1	16	1900637	SHAFT, GEAR
1	15	1900636	POINTER-INDEX
1	14	1900635	GEAR-OUTPUT
1	13	1900634	CAP, BEARING
1	12	1900633	CAP, BEARING
2	11	1900725	LEVER, SHAFT LOCK
1	10	1900631	WASHER, THRUST
1	9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
1	8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
1	7	1900629	LOCK-SHAFT (L.H.)
1	6	1900628	LOCK-SHAFT (R.H.)
1	5	1900627	RETAINER, BEARING
1	4	1900626	RETAINER, BEARING
2	3	1900625	CARTRIDGE, BEARING
1	2	1900622	RING-BASE
1	1	1900621	G AND N FIXTURE BASE SET (MATCHED)

R	R
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2
P	L
N	L
M	L
L	L
K	K
J	J

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2
H	E
G	E
F	E
E	E
D	C
C	C

REVISION STATUS OF SHEETS

APPLICATION: NEXT ASSY	APPLICATION: USED ON	APPLICABLE DASH NO.
1900030	1900030	-011

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED C. Tang 16 FEB 63
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO
SIZE J3
1900014
SCALE 1:4
SHEET 1 OF 2

R

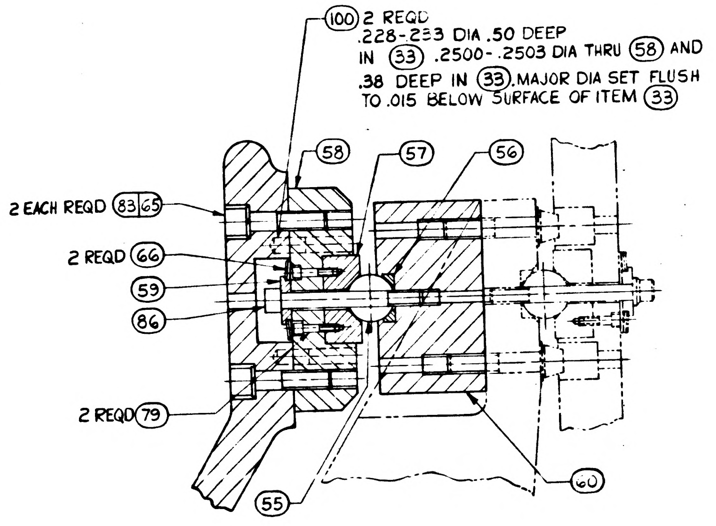
1900014

1900014 SH 1

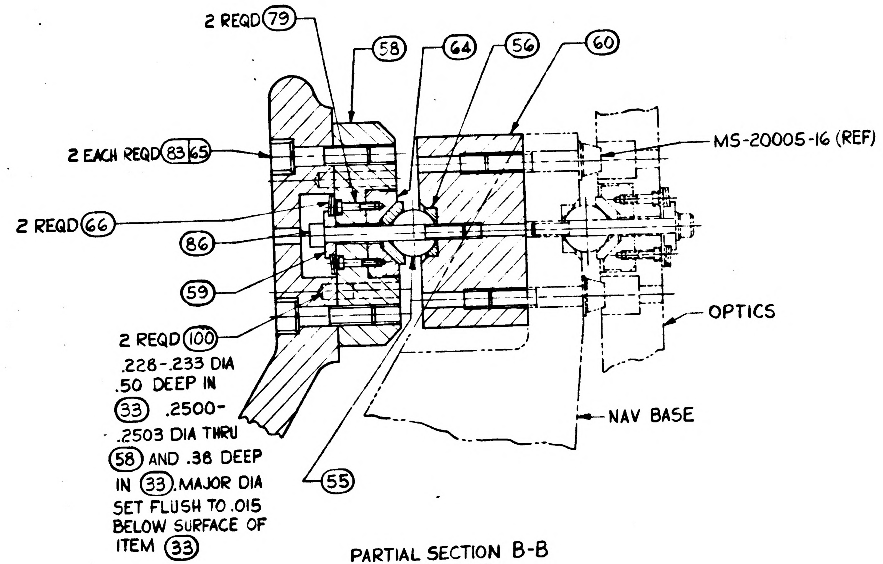
3/1900014

67 2 EACH REQD

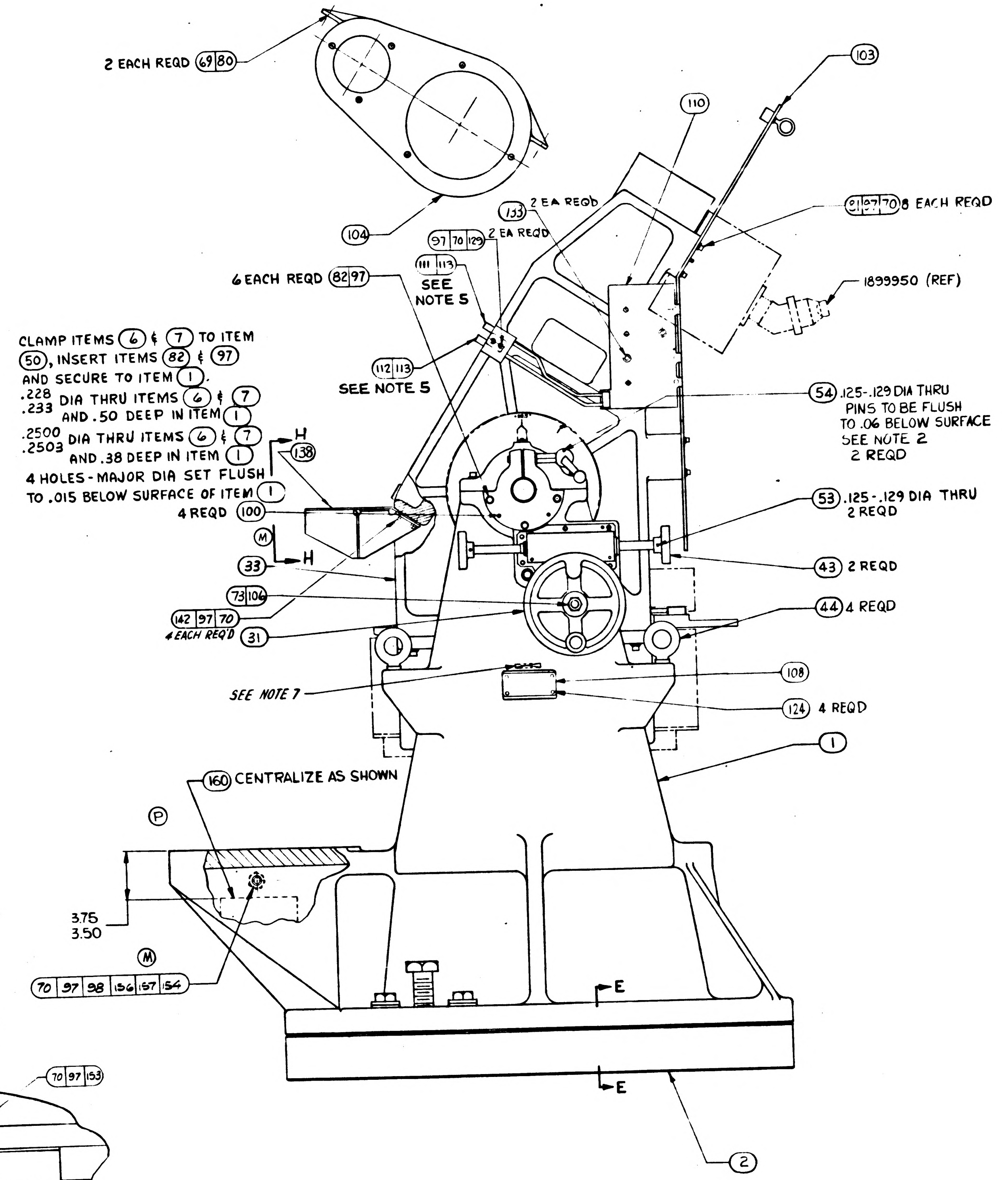
REQD

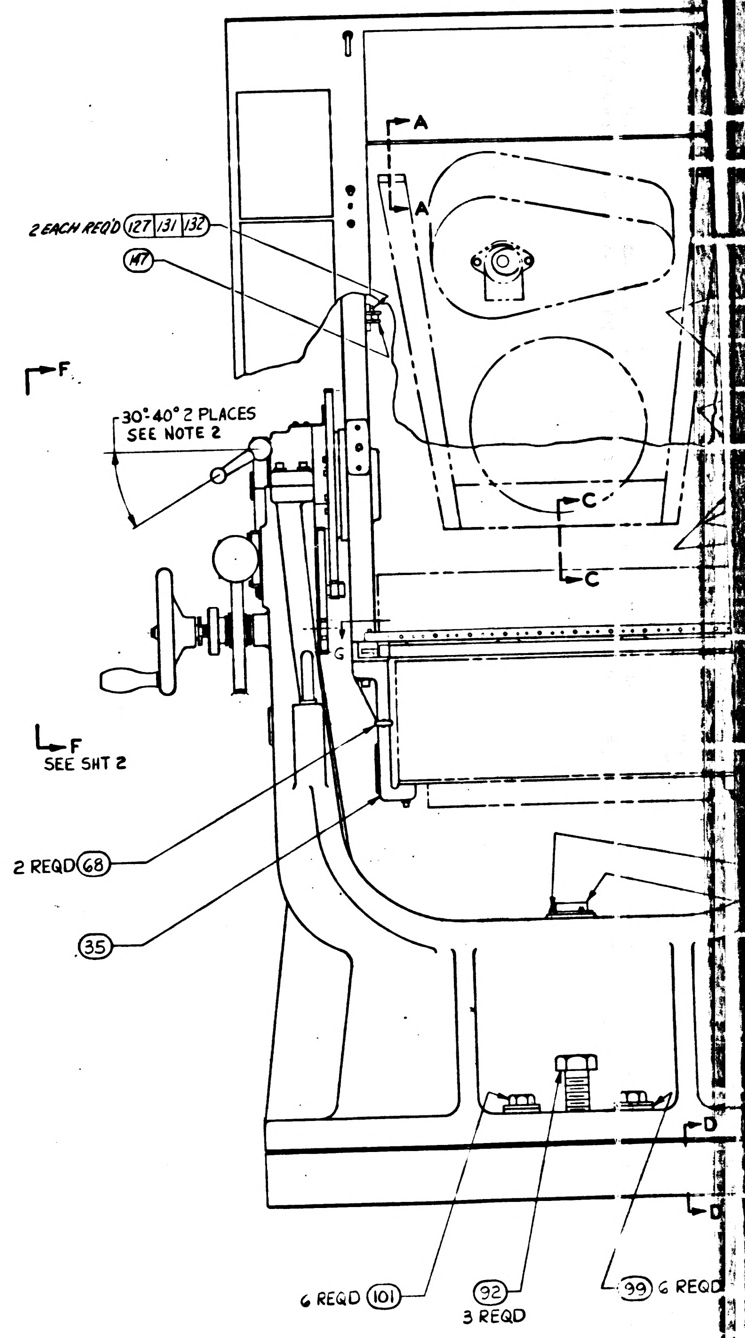

100 2 REQD .228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 58 AND .38 DEEP IN 33, MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
58
57
56
2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79
60
55

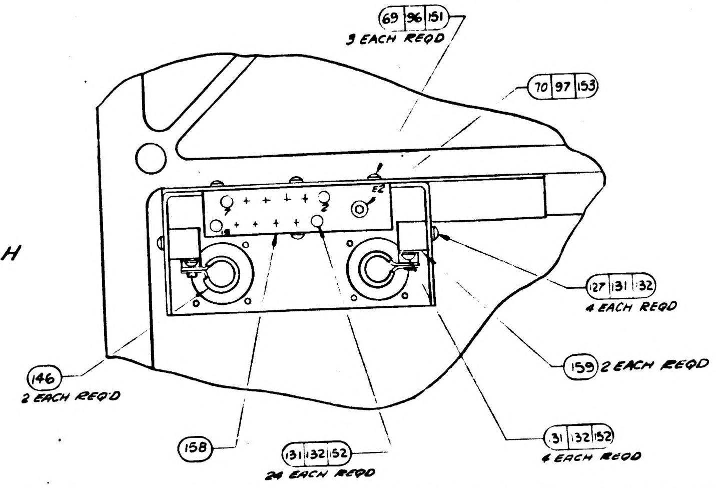
PARTIAL SECTION A-A
FULL SCALE


2 REQD 79
58
64
56
60
2 EACH REQD 83 65
MS-20005-16 (REF)
2 REQD 66
86
59
OPTICS
2 REQD 100 .228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 58 AND .38 DEEP IN 33, MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
NAV BASE
55

PARTIAL SECTION B-B
FULL SCALE


2 EACH REQD 69 80
103
110
104
133 2 EA REQD
2 EA REQD
97 70 129
111 113
SEE NOTE 5
91 97 70 8 EACH REQD
6 EACH REQD 82 97
1899950 (REF)
112 113
SEE NOTE 5
CLAMP ITEMS 6 & 7 TO ITEM 50, INSERT ITEMS 82 & 97 AND SECURE TO ITEM 1.
.228 .233 DIA THRU ITEMS 6 & 7 AND .50 DEEP IN ITEM 1
.2500 .2503 DIA THRU ITEMS 6 & 7 AND .38 DEEP IN ITEM 1
4 HOLES - MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 1
4 REQD 100
H
138
M
H
33
54 .125-.129 DIA THRU PINS TO BE FLUSH TO .06 BELOW SURFACE SEE NOTE 2 2 REQD
53 .125-.129 DIA THRU 2 REQD
43 2 REQD
73 106
142 97 70 4 EACH REQD
31
44 4 REQD
108
SEE NOTE 7
124 4 REQD
1
160 CENTRALIZE AS SHOWN
P
3.75
3.50
M
70 97 98 156 157 154
E
E
2


A
A
2 EACH REQD 127 131 132
147
F
30°-40° 2 PLACES SEE NOTE 2
C
C
F SEE SHT 2
2 REQD 68
35
D
D
6 REQD 101
32 3 REQD
39 6 REQD


69 96 151 3 EACH REQD
70 97 133
27 131 132 4 EACH REQD
159 2 EACH REQD
146 2 EACH REQD
158
131 132 52 24 EACH REQD
31 132 52 4 EACH REQD

M
PARTIAL VIEW H-H
SCALE 1:2

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. PIN (11) TO (8) OR (9) AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.

3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

QUAN.	ITEM NO
10	69
6	71
6	161
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144
4	155

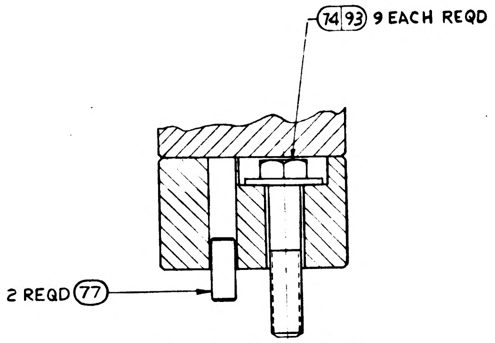
5. INSTALLATION OF QUICK DISCONNECT COUPLING HALVES.
   - A. APPLY A THIN FILM OF DOW-CORNING LUBRICANT NO. 55 (MIL-L-4343A) TO ENTIRE SURFACE OF ITEM (113).
   - B. INSTALL ITEM (111) AND (112) WITH A TORQUE OF 65-75 IN-LB.

6. APPLY A LIGHT COATING OF MIL-L-6085 OIL TO ALL SLIDING SURFACES OF PARTS INDICATED.

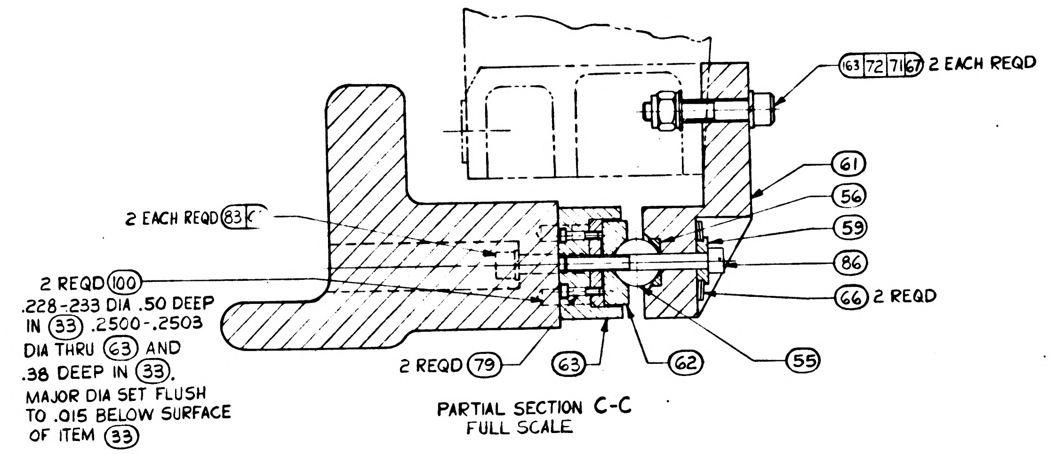
7. MARK APPLICABLE REVISION LETTER (REV. ___) PER ND1002019, .12 HIGH, COLOR BLACK, CENTRALIZED .12 ABOVE ITEM 108.

8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. ON ITEM 108 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.

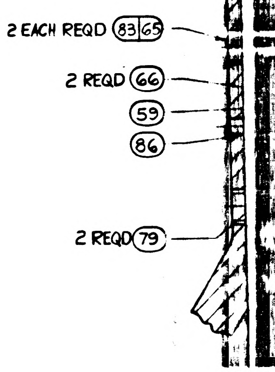
9. APPLY MIL-G-3278(ES-134) MATING THREADS AND SURFACES BETWEEN ITEMS (7), (9) AND (73); (6), (8) AND (73).

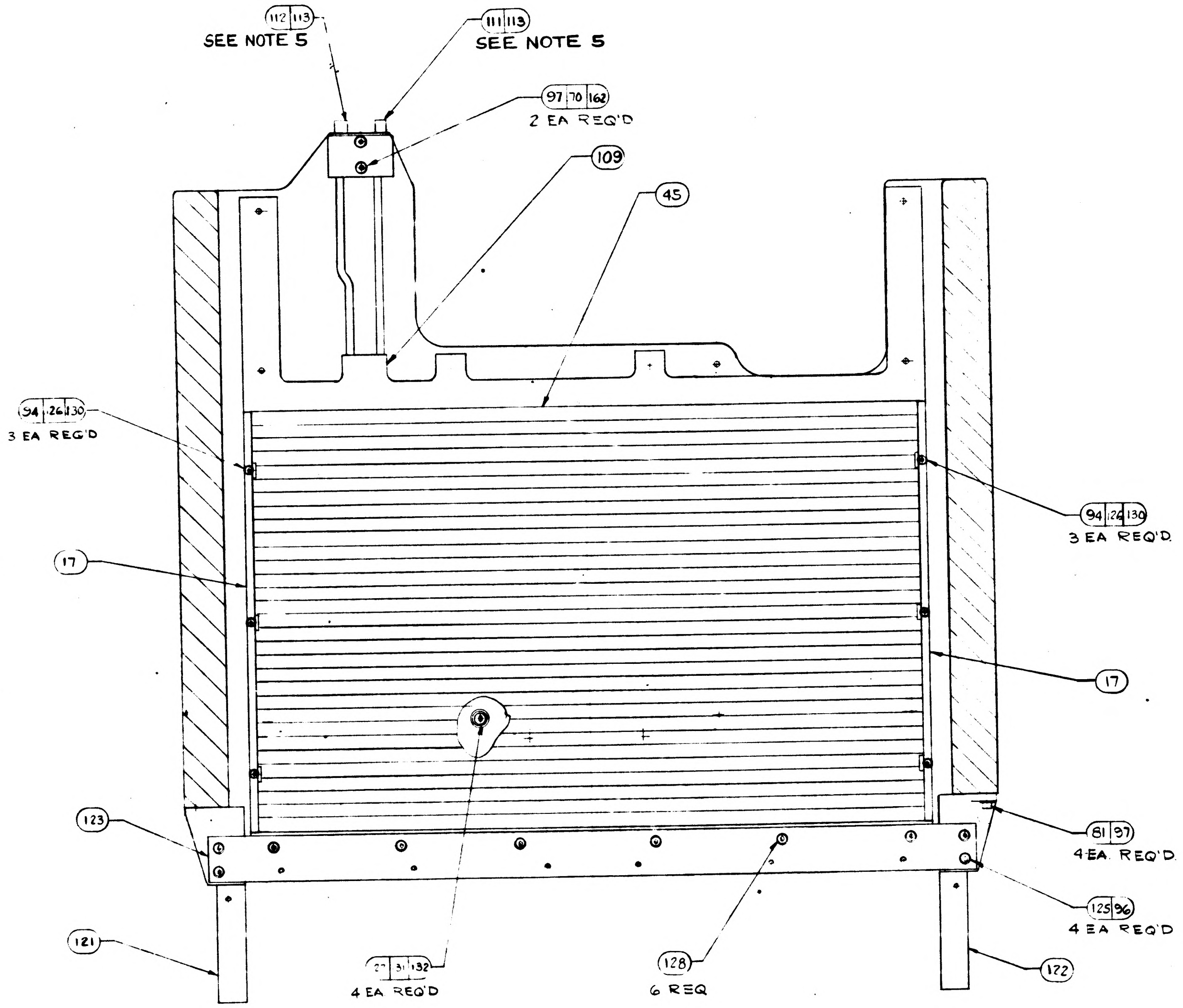

74 93 9 EACH REQD
2 REQD 77

PARTIAL SECTION D-D
SCALE 1:2

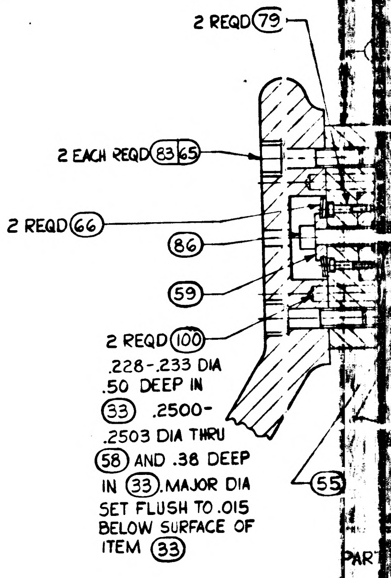

163 72 71 67 2 EACH REQD
2 EACH REQD 83
61
56
59
86
66 2 REQD
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 63 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
2 REQD 79
63
62
55

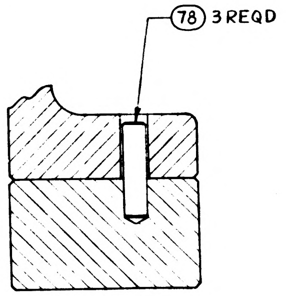
PARTIAL SECTION C-C
FULL SCALE


2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79


112 113
SEE NOTE 5
111 113
SEE NOTE 5
97 70 162
2 EA REQ'D
109
45
94 126 130
3 EA REQ'D
94 126 130
3 EA REQ'D
17
17
123
81 97
4 EA REQ'D
125 96
4 EA REQ'D
121
27 31 132
4 EA REQ'D
128
6 REQ
122

VIEW G-G
(SCALE 1:2)

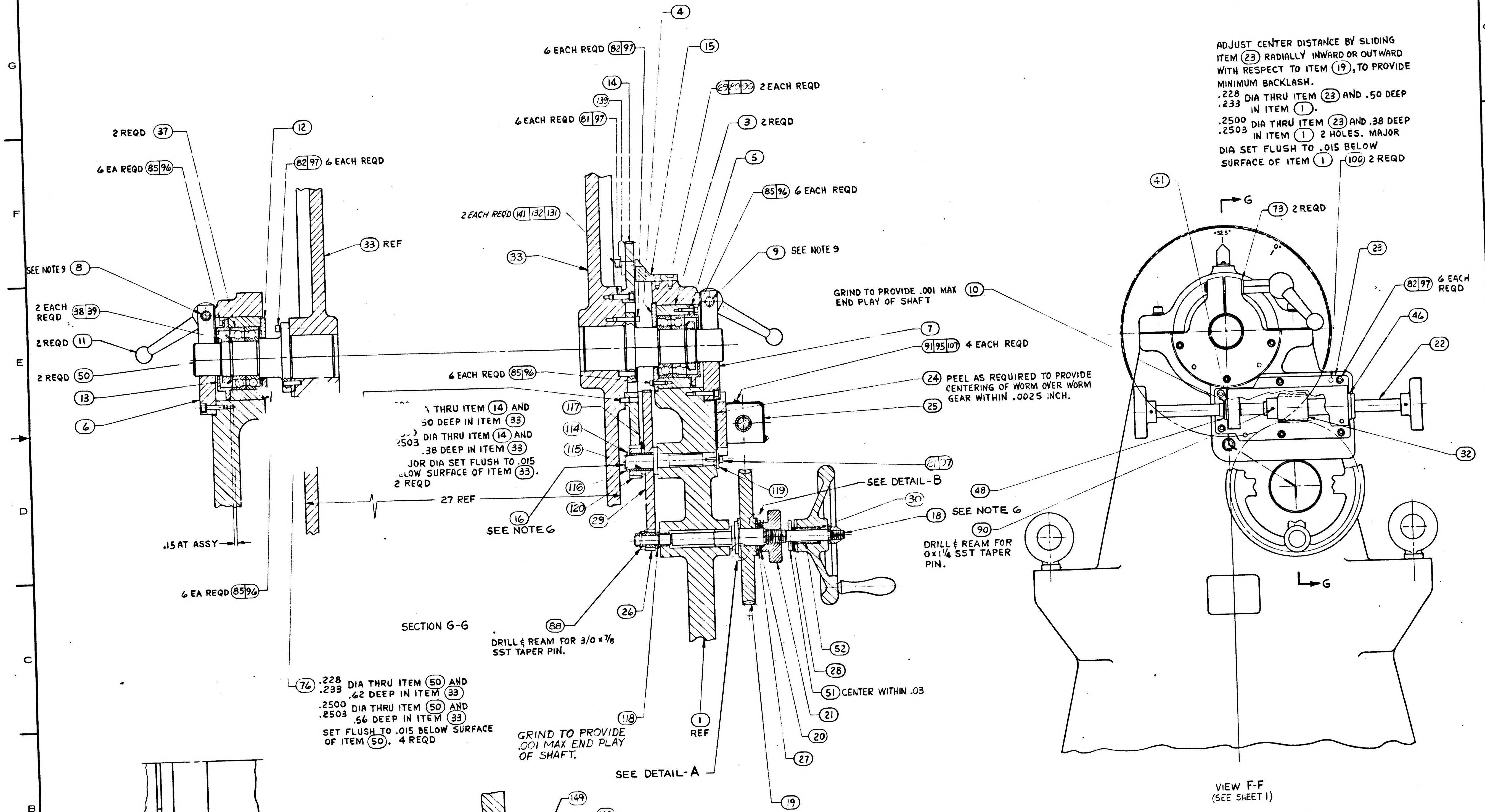

2 REQD 79
2 EACH REQD 83 65
2 REQD 66
86
59
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 58 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
55
PAR



PARTIAL SECTION E-E
SCALE 1:2

1900014	SH 1

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	THIS SHEET ADDED PER MXC-190286. PER TDRR 04095		24 SEP 63	RJM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDRR 07455		13-JAN-63	MEM
J		CHANGE IN ACCORDANCE WITH CM 196276 TDRR 09224		17 APR 64	J.C
K		CHANGE IN ACCORDANCE WITH CM-196929 TDRR 09225		3 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CMI97337 TDRR 10823		22 MAY 64	FM
K		CHANGE IN ACCORDANCE WITH CM 199763 REVISED PER TDRR 14931		2 SEP 64	J.K


6 EACH REQD (82)(97)
(4)
(15)
(14)
(139)
(63)(64)(65) 2 EACH REQD
6 EACH REQD (81)(97)
(3) 2 REQD
(5)
2 REQD (37)
(12)
6 EA REQD (85)(96)
(82)(97) 6 EACH REQD
(85)(96) 6 EACH REQD
2 EACH REQD (141)(132)(131)
(33) REF
(33)
(9) SEE NOTE 9
SEE NOTE 9 (8)
2 EACH REQD (38)(39)
2 REQD (11)
2 REQD (50)
(13)
(6)
(7)
(91)(95)(107) 4 EACH REQD
6 EACH REQD (85)(96)
(24)
(25)
(117)
(114)
(115)
(116)
(120)
(16) SEE NOTE 6
(29)
27 REF
(21)(27)
(119)
SEE DETAIL-B
(30)
(18) SEE NOTE 6
(90)
.15 AT ASSY
6 EA REQD (85)(96)
(88)
(26)
(52)
(28)
(51) CENTER WITHIN .03
(21)
(20)
(27)
(118)
(1) REF
SEE DETAIL-A
(19)
(76)
(41)
G
(73) 2 REQD
+32.5°
0°
(23)
(82)(97) 6 EACH REQD
(46)
(22)
(10)
(32)
(48)
G

SECTION G-G

VIEW F-F
(SEE SHEET 1)

ADJUST CENTER DISTANCE BY SLIDING ITEM (23) RADIALLY INWARD OR OUTWARD WITH RESPECT TO ITEM (19), TO PROVIDE MINIMUM BACKLASH.

$\begin{smallmatrix}.228\\.233\end{smallmatrix}$ DIA THRU ITEM (23) AND .50 DEEP IN ITEM (1).

$\begin{smallmatrix}.2500\\.2503\end{smallmatrix}$ DIA THRU ITEM (23) AND .38 DEEP IN ITEM (1) 2 HOLES. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (1) (100) 2 REQD

GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT (10)

(24) PEEL AS REQUIRED TO PROVIDE CENTERING OF WORM OVER WORM GEAR WITHIN .0025 INCH.

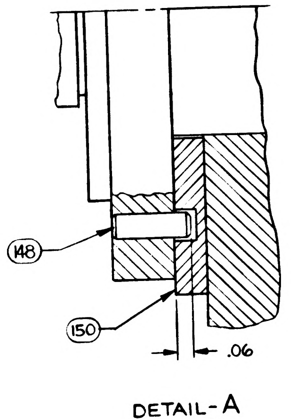
A THRU ITEM (14) AND
50 DEEP IN ITEM (33)
.2503 DIA THRU ITEM (14) AND
.38 DEEP IN ITEM (33)
JOR DIA SET FLUSH TO .015
ELOW SURFACE OF ITEM (33).
2 REQD

(90) DRILL & REAM FOR 0x1¼ SST TAPER PIN.

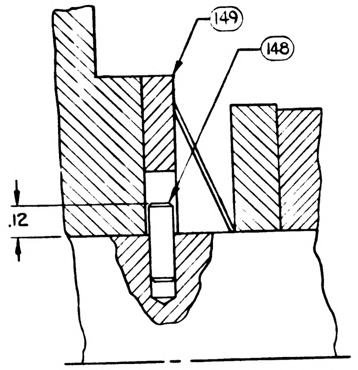
(88) DRILL & REAM FOR 3/0 x 7/8 SST TAPER PIN.

(76) $\begin{smallmatrix}.228\\.233\end{smallmatrix}$ DIA THRU ITEM (50) AND .62 DEEP IN ITEM (33)
$\begin{smallmatrix}.2500\\.2503\end{smallmatrix}$ DIA THRU ITEM (50) AND .56 DEEP IN ITEM (33)
SET FLUSH TO .015 BELOW SURFACE OF ITEM (50). 4 REQD

(118) GRIND TO PROVIDE .001 MAX END PLAY OF SHAFT.



DETAIL-A
SCALE 4:1



DETAIL-B
SCALE 4:1

FOR INFORMATION ONLY

CLASS B' RELEASE TDR No. 21755 **DATE**

© THIS SHEET ADDED

1900030-011	1900030-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS ±.005 ±.02
ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

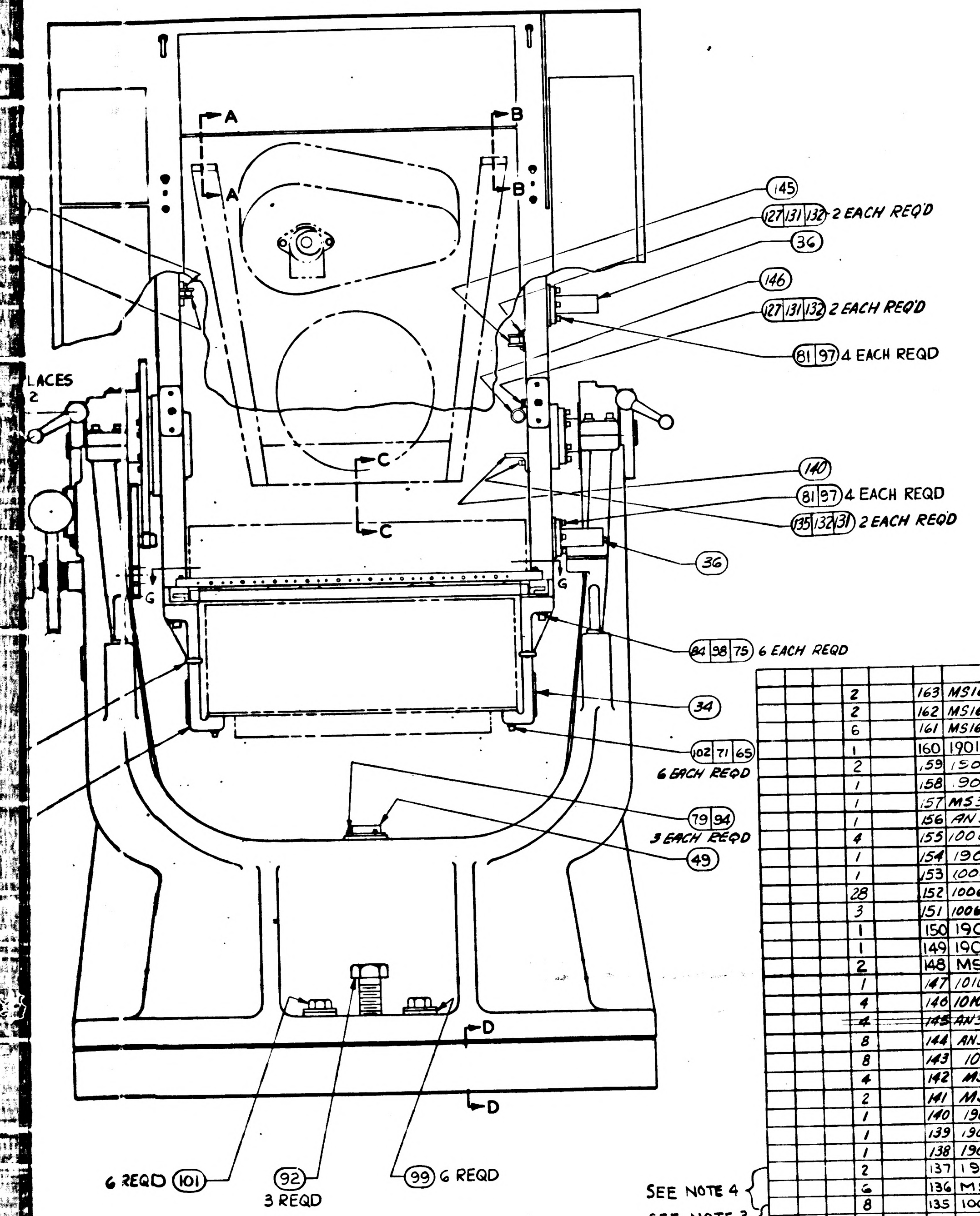
AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED C. Berry 16 SEP '63
APPROVAL E.C. Hallmann Sep 63
APPROVAL L. Jelman 9/24/63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO
SIZE E
1900014
SCALE 1:2
SHEET 2 OF 2

1900014



REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 0409	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN 64	K.F.W. MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDRR 07455		13 JAN 63	K.F.W. MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 TDRR 07456		13 JAN 64	JJ MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 TDRR 07457		3 FEB 64	K.F.W. MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR		26 FEB 64	W.E.
J		CHANGE IN ACCORDANCE WITH CM 196276 TDRR 09224		23 APR 64	J.C. PJ
K		CHANGE IN ACCORDANCE WITH CM-196929 PER TDRR 09225		13 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CM 197537 PER TDRR 10823		22 MAY 64	EM
M		CHANGE IN ACCORDANCE WITH CM 197475 PER TDRR 10824		11 JUNE 64	BK RWK
N		CHANGE IN ACCORDANCE WITH CM 197506 PER TDRR 10825		16 JUNE 64	BK RWK
P		CHANGE IN ACCORDANCE WITH CM 197639 TDRR 11552		23 JUNE 64	DGS RWK
R		CHANGE IN ACCORDANCE WITH CM 199763 REVISED PER TDRR		2 SEP 64	J.C. PJ
S	-	CHANGED IN ACCORDANCE WITH CM 302702 TDRR 14752	-	22 SEPT 64	T.P. CW

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		163	MS16998-60	SCREW, HEX SOC.
	2		162	MS16995-54	SCREW, HEX SOC.
	6		161	MS16995-67	SCREW, HEX SOC
	1		160	1901687	PLATE-INSTRUCTION
	2		159	1901673	BLOCK-SUPPORT CLAMP
	1		158	1901672	BUS BAR
	1		157	MS35690-410	NUT-HEX PLAIN
	1		156	AN960C616	(1897006-062) WASHER-FLAT
	4		155	1006783-47	SCREW-BUTTON HD., HEX SOC.
	1		154	1901685	STUD-GROUND
	1		153	1006783-51	SCREW-BUTTON HD, HEX SOC.
	28		152	1006783-26	SCREW-BUTTON HD., HEX SOC.
	3		151	1006783-44	SCREW-BUTTON HD, HEX SOC.
	1		150	1901667-001	WASHER, THRUST
	1		149	1901668-001	WASHER, THRUST
	2		148	MS171493	PIN, ROLL
	1		147	1010400-1	CLAMP-LOOP HINGED
	4		146	1010400-3	CLAMP-LOOP HINGED
	~~4~~		~~145~~	~~AN363C832~~	~~(1896990-281) NUT-SELF LOCKING~~
	8		144	AN363C632	(1896990-261) NUT-SELF LOCKING
	8		143	1006783-23	SCREW-BUTTON HD. HEX SOC.
	4		142	MS16995-50	SCREW-CAP
	2		141	MS16995-28	SCREW-CAP
	1		140	1901650	BRACKET-CONN., ELEC
	1		139	1901643	GUARD-HARNESS
	1		138	1901639	BRACKET-CONN., ELEC.
SEE NOTE 4	2		137	1901594	SCREW-SHOULDER
	6		136	MS-16996-16	SCREW-CAP
SEE NOTE 3	8		135	1006783-29	SCREW-BUTTON HD. HEX. SOC.

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		133	1015831-249	SCREW-FLAT HD. HEX. SOC
	46		132	MS-35338-80	WASHER-LOCK
SEE NOTE 4	52		131	AN 960-C-8L	(1897006-038) WASHER FLAT
	8		130	AN 960-C-4	(1897006-024) WASHER FLAT
	2		129	MS-16995-55	SCREW-CAP
	6		128	1015826-296	SCREW-FL. HD.
SEE NOTE 3	14		127	1006783-27	SCREW-BUTTON HD
	8		126	1006783-20	SCREW, BUTTON HD.
	4		125	MS-16996-14	SCREW-CAP SOC. HD.
	4		124	AN 535-0-4	SCREW-DRIVE
	1		123	1900874	CAP-TOE, GSE, PSA.
	1		122	1901348	BRACKET-SUPPORT R.H.
	1		121	1901347	BRACKET-SUPPORT L.H.
	1		120	1900939	PINION-CHANGE GEAR
	1		119	1900938	WASHER
	1		118	1900937	WASHER-STEP
	1		117	1900936	SPACER
	1		116	MS-16624-4075	RING-RETAINING
	1		115	1900940	BUSHING-COMPOUND
	1		114	1900935	WASHER-FLAT
	2		113	1000159-6	PACKING, PREFORMED O-RING
SEE NOTE 3	1		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
	1		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
	1		110	1015424	COLDPLATE, CDU
GFP	1		109	1901821	COLDPLATE, PSA, TYPE 014 (INSEP ASSY)
	1		108	1901304-211	PLATE, IDENTIFICATION
	12		107	AN960C6L	(1897006-036 WASHER-FLAT
	1		106	NAS1408C8	(1896868-108) NUT-SELF LOCKING
SEE NOTE 4	6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
	1		104	1900590	GUARD AND SEAL ASSY
	1		103	1900552	RACK
SEE NOTE 4	6		102	MS-16995-68	SCREW, HEX SOC
	6		101	MS35305-240	SCREW, CAP
SEE NOTE 3	14		100	1016093-001	PIN-STEP DOWEL
	6		99	1016095-007	WASHER-SPHERICAL
	7		98	MS35338-84	WASHER-LOCK, SPLIT
	59		97	MS35338-82	WASHER-LOCK, SPLIT
	33		96	MS35338-81	WASHER-LOCK, SPLIT
	4		95	MS35338-79	WASHER-LOCK, SPLIT
	11		94	MS35338-78	WASHER-LOCK, SPLIT
	9		93	MS35305-242	SCREW, CAP
	3		92	MS35300-316	SCREW, CAP
	4		91	MS35216-25	SCREW, MACHINE, PAN HD
	1		90	MS24692-162	PIN-TAPER
	1		89	MS24692-189	PIN-TAPER
	2		88	MS24692-108	PIN-TAPER
	~~2~~		~~87~~	~~MS16998-62~~	~~SCREW-HEX SOC~~
	3		86	MS16998-50	SCREW-HEX SOC
	24		85	MS16996-12	SCREW, CAP
	6		84	MS16995-84	SCREW, CAP
	6		83	MS16995-67	SCREW, CAP
	24		82	MS16995-53	SCREW, CAP
	27		81	MS16995-52	SCREW, CAP
	4		80	MS16995-37	SCREW, CAP
	9		79	MS16995-11	SCREW, CAP
	3		78	MS16556-104	PIN-STRAIGHT
	2		77	MS16556-101	PIN-STRAIGHT
	4		76	MS16555-648	PIN-STRAIGHT
	6		75	MS15795-315	WASHER, FLAT
	9		74	MS15795-126	WASHER, FLAT
	3		73	AN960C816	(1897006-082) WASHER-FLAT
	2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
SEE NOTE 4	14		71	AN960C516	(1897006-052) WASHER-FLAT
	16		70	AN960C416	(1897006-042) WASHER-FLAT
SEE NOTE 4	17		69	AN960C10	(1897006-017) WASHER-FLAT
SEE NOTE 3	2		68	1015916-001	BOLT-EYE
	2		67	NAS70V328-563	WASHER-FIBRE
	6		66	1899979	WASHER-BELLEVILLE
	12		65	MS-35338-83	WASHER-LOCK
	1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
	1		63	1900581	PAD
	1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
	1		61	1900580	MOUNT-BALL
	2		60	1900583	SPACER-BALL MOUNT
	3		59	1900962	COLLAR-CENTERING
	2		58	1900582	PAD
	1		57	1900968	INSERT-BALL MOUNT. STAT.
	3		56	1900972	INSERT
	3		55	1900963	BALL-PRECISION
	2		54	MS-171537	PIN-SPRING
	2		53	MS-171536	PIN-SPRING
	1		52	MS-24585-C499	(1897067-499) SPRING
	1		51	MS171600	PIN, SPRING
	2		50	1900624	SHAFT-TRUNNION
SEE NOTE 3	1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
	1		48	MS-16624-4075	RING, RETAINING
	~~2~~		~~47~~	~~1901622-002~~	~~BEARING-THRUST~~
	1		46	MS-17796-112	BEARING-SLEEVE
	1		45	1901369	PAD, THERMAL INTERFACE
SEE NOTE 3	4		44	1015916-003	BOLT-EYE
	2		43	1900632	KNOB, FINE ADJUST
	~~1~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
	1		41	MS-17796-89	BEARING, SLEEVE
	~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02788 DATE

Ⓒ REPLACES REV "B" WITH CHANGE

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2		39	MS-172211	WASHER, KEY, BEARING RETAINING
2		38	MS-172246	NUT, SPANNER
2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
2		36	1900571	SHAFT, STOP
1		35	1900716	BRACKET, MOUNTING (L.H.)
1		34	1900715	BRACKET, MOUNTING (R.H.)
1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
1		32	1900776	WORM R.H.
1		31	1900724	HANDWHEEL
1		30	1900723	WASHER
1		29	1900722	GEAR, INTERMEDIATE
1		28	1900721	GUIDE, SPRING
1		27	1900720	WASHER, SPRING
1		26	1900647	PINION
1		25	1900646	COVER-WORM
1		24	1900645	SHIM, LAMINATED
1		23	1900644	BRACKET, WORM
1		22	1900643	SHAFT, WORM, FINE ADJUST
1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
1		20	1900641	WASHER, THRUST
1		19	1900640	GEAR-WORM R.H.
1		18	1900639	SHAFT, COARSE ADJUST
2		17	1901370	CLAMP THERMAL INTERFACE MATL
1		16	1900637	SHAFT, GEAR
1		15	1900636	POINTER-INDEX
1		14	1900635	GEAR-OUTPUT
1		13	1900634	CAP, BEARING
1		12	1900633	CAP, BEARING
2		11	1900725	LEVER, SHAFT LOCK
1		10	1900631	WASHER, THRUST
1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
1		7	1900629	LOCK-SHAFT (L.H.)
1		6	1900628	LOCK-SHAFT (R.H.)
1		5	1900627	RETAINER, BEARING
1		4	1900626	RETAINER, BEARING
2		3	1900625	CARTRIDGE, BEARING
1		2	1900622	RING-BASE
1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)

LIST OF PARTS AND MATERIALS

1900030	1900030	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED 16 SEP 63
APPROVAL 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO. | SIZE J3 | 1900014
SCALE 1:4 | SHEET 1 OF 2

S	R
R	R
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

P	L
N	L
M	L
L	L
K	K
J	J
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

H	E
G	E
F	E
E	E
D	C
C	C
SHEET 1	SHEET 2

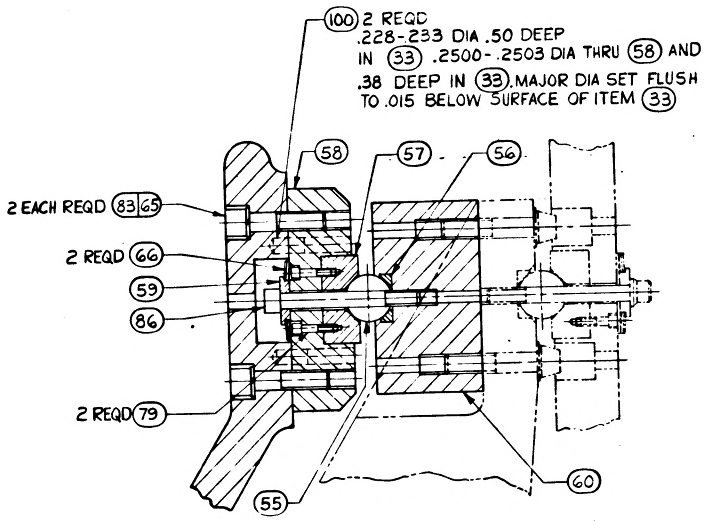
REVISION STATUS OF SHEETS

1900014 SH 1

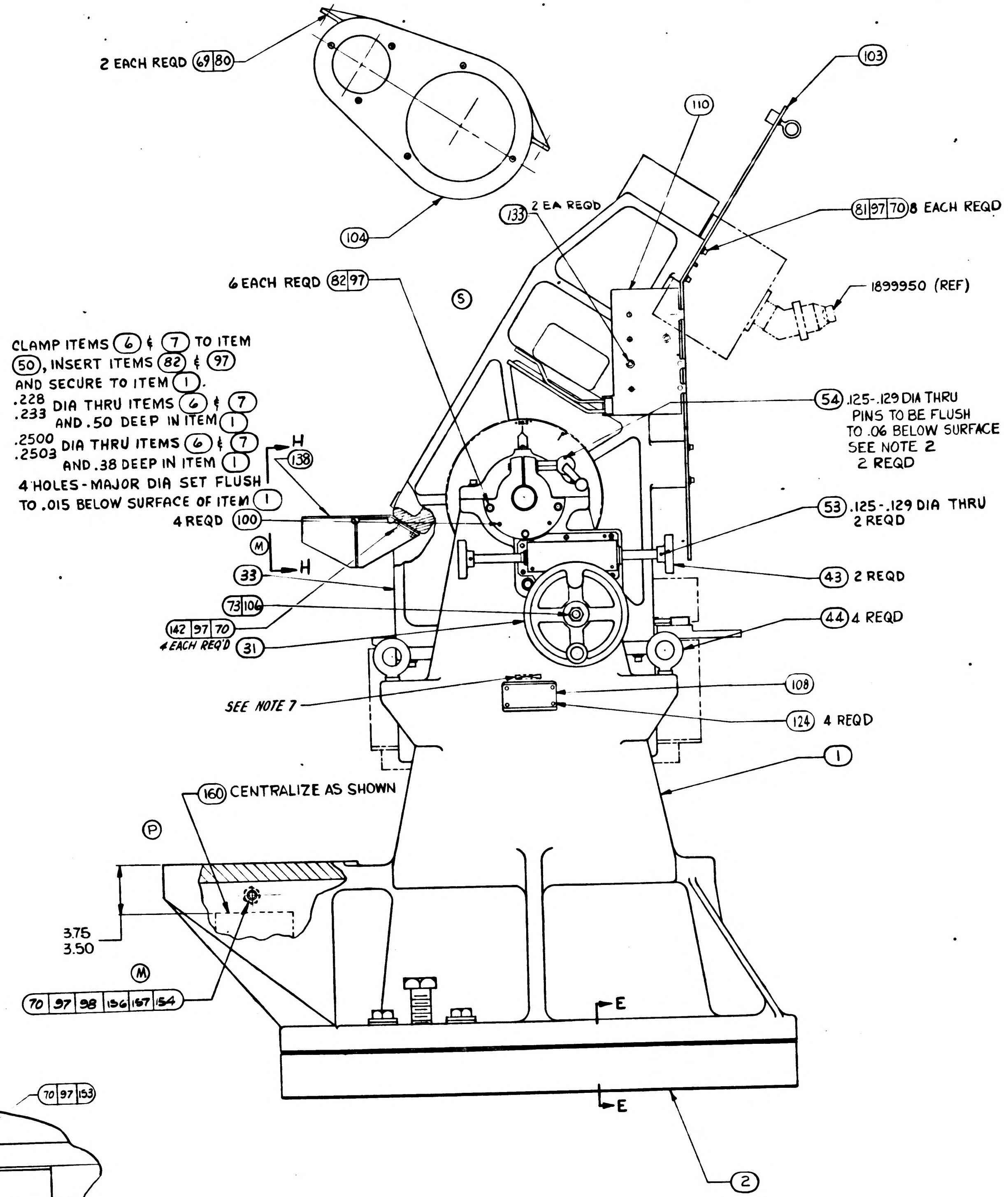
3/1900014

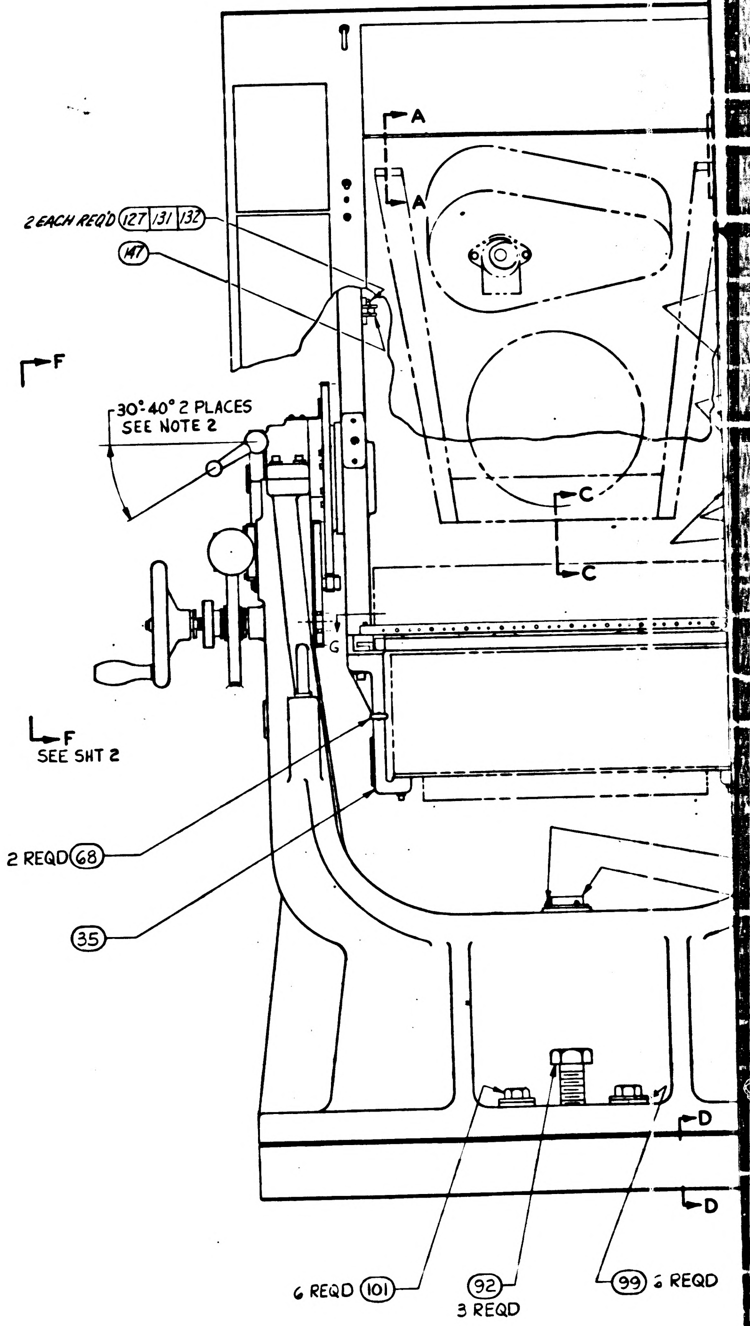
67 2 EACH REQ'D

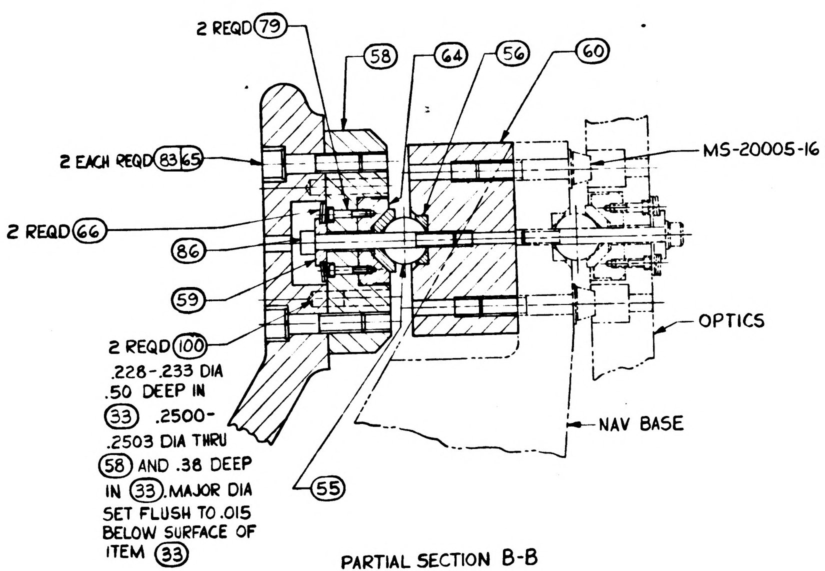
EQD


100 2 REQD
.228-.233 DIA .50 DEEP
IN 33 .2500-.2503 DIA THRU 58 AND
.38 DEEP IN 33. MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 33
58
57
56
2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79
55
60

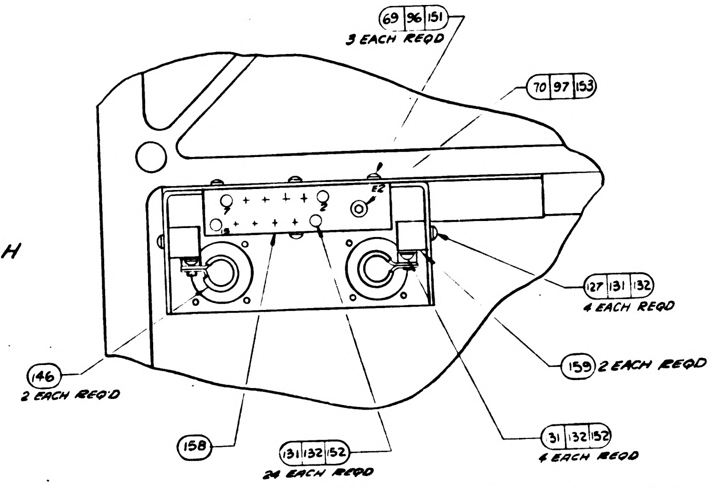
PARTIAL SECTION A-A
FULL SCALE


2 EACH REQD 69 80
103
110
104
133 2 EA REQD
81 97 70 8 EACH REQD
6 EACH REQD 82 97
S
1899950 (REF)
CLAMP ITEMS 6 & 7 TO ITEM
50, INSERT ITEMS 82 & 97
AND SECURE TO ITEM 1.
.228
.233 DIA THRU ITEMS 6 & 7
AND .50 DEEP IN ITEM 1
.2500
.2503 DIA THRU ITEMS 6 & 7
AND .38 DEEP IN ITEM 1
4 HOLES-MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM 1
4 REQD 100
H
138
M
33
H
73 106
142 97 70
4 EACH REQ'D
31
54 .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
53 .125-.129 DIA THRU
2 REQD
43 2 REQD
44 4 REQD
108
SEE NOTE 7
124 4 REQD
1
160 CENTRALIZE AS SHOWN
P
3.75
3.50
M
70 97 98 136 137 154
E
E
2


A
A
2 EACH REQD 127 131 132
147
F
30°-40° 2 PLACES
SEE NOTE 2
C
C
F
SEE SHT 2
2 REQD 68
35
D
D
6 REQD 101
92
3 REQD
99 2 REQD


2 REQD 79
58
64
56
60
2 EACH REQD 83 65
MS-20005-16 (REF)
2 REQD 66
86
59
OPTICS
2 REQD 100
.228-.233 DIA
.50 DEEP IN
33 .2500-
.2503 DIA THRU
58 AND .38 DEEP
IN 33. MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM 33
NAV BASE
55

PARTIAL SECTION B-B
FULL SCALE


69 96 151
3 EACH REQD
70 97 153
27 131 132
4 EACH REQD
159 2 EACH REQD
146
2 EACH REQD
158
131 132 52
24 EACH REQD
31 132 52
4 EACH REQD

M

PARTIAL VIEW H-H
SCALE 1:2

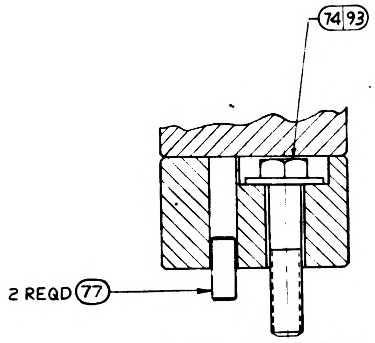
AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION
MILWAUKEE, WISCONSIN
1900014

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. PIN (11) TO (8) OR (9) AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING
4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

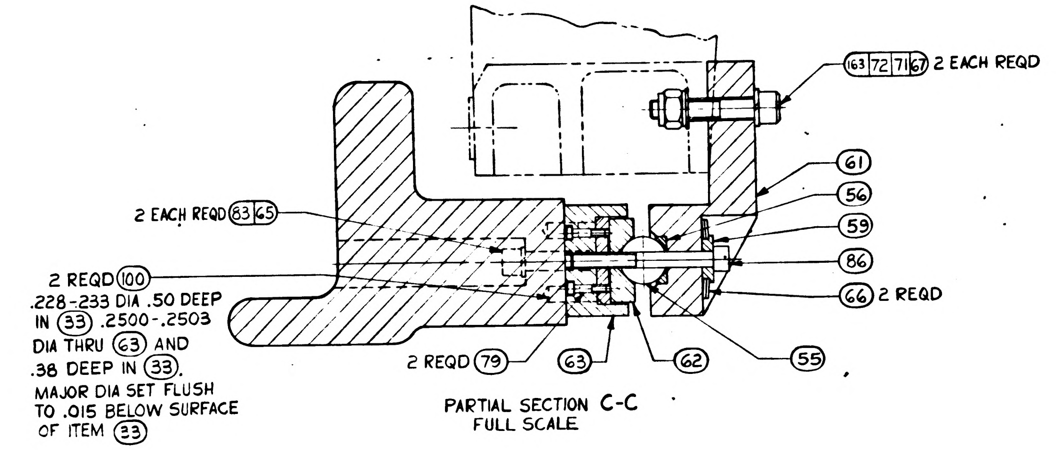
QUAN.	ITEM NO
10	69
6	71
6	161
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144
4	155

5. INSTALLATION OF QUICK DISCONNECT COUPLING HALVES.
   A. APPLY A THIN FILM OF DOW-CORNING LUBRICANT NO. 55 (MIL-L-4343A) TO ENTIRE SURFACE OF ITEM (113).
   B. INSTALL ITEM (111) AND (112) WITH A TORQUE OF 65-75 IN-LB.
6. APPLY A LIGHT COATING OF MIL-L-6085 OIL TO ALL SLIDING SURFACES OF PARTS INDICATED.
7. MARK APPLICABLE REVISION LETTER (REV. ___) PER ND1002019, .12 HIGH, COLOR BLACK, CENTRALIZED .12 ABOVE ITEM 108.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. ON ITEM 108 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.
9. APPLY MIL-G-3278(ES-134) MATING THREADS AND SURFACES BETWEEN ITEMS (7), (9) AND (73); (6), (8) AND (73).



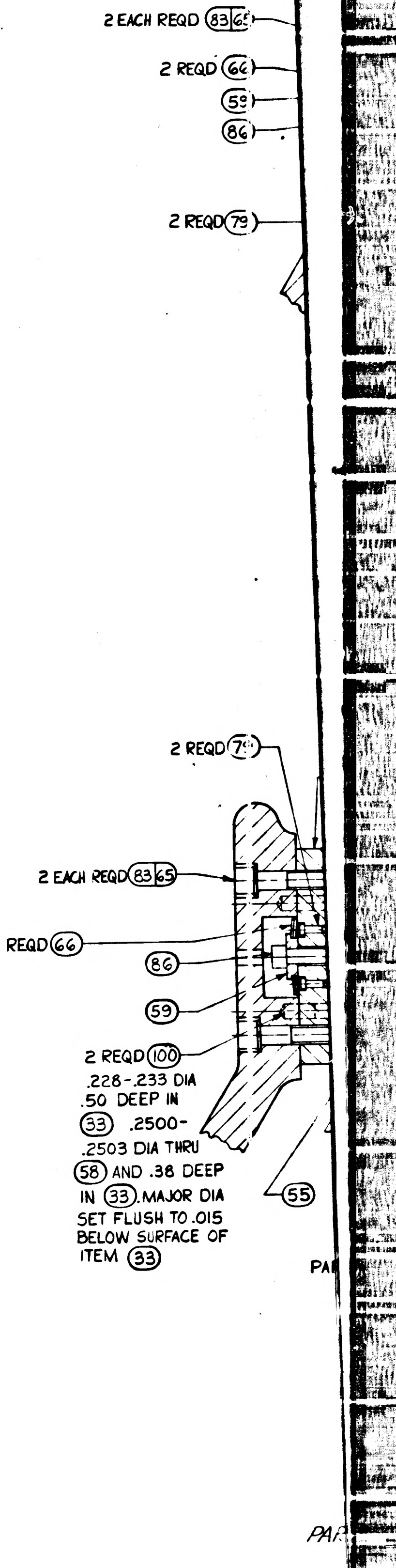
74 93 9 EACH REQD
2 REQD 77

PARTIAL SECTION D-D
SCALE 1:2

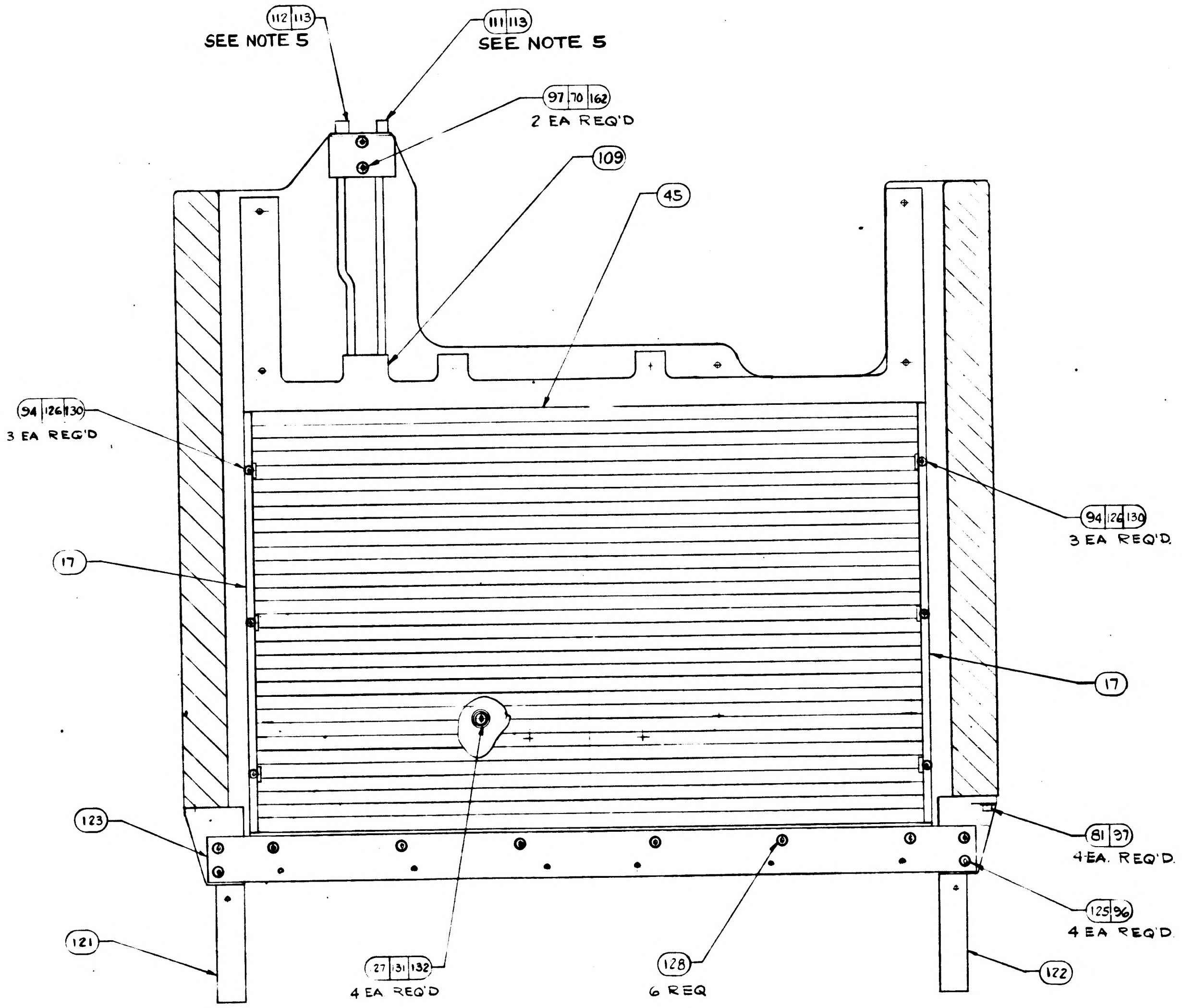


163 72 71 67 2 EACH REQD
61
56
59
86
66 2 REQD
55
62
63
2 REQD 79
2 EACH REQD 83 65
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 63 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33

PARTIAL SECTION C-C
FULL SCALE

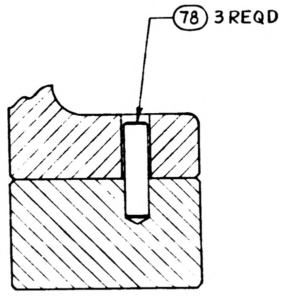


2 EACH REQD 83 65
2 REQD 66
59
86
2 REQD 79
2 REQD 79
2 EACH REQD 83 65
2 REQD 66
86
59
2 REQD 100
.228-.233 DIA .50 DEEP IN 33 .2500-.2503 DIA THRU 58 AND .38 DEEP IN 33. MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM 33
55
PA
PAI



112 113 SEE NOTE 5
111 113 SEE NOTE 5
97 70 162 2 EA REQ'D
109
45
94 126 130 3 EA REQ'D
94 126 130 3 EA REQ'D
17
17
123
81 37 4 EA. REQ'D
125 96 4 EA REQ'D
121
27 131 132 4 EA REQ'D
128 6 REQ
122

VIEW G-G
(SCALE 1:2)



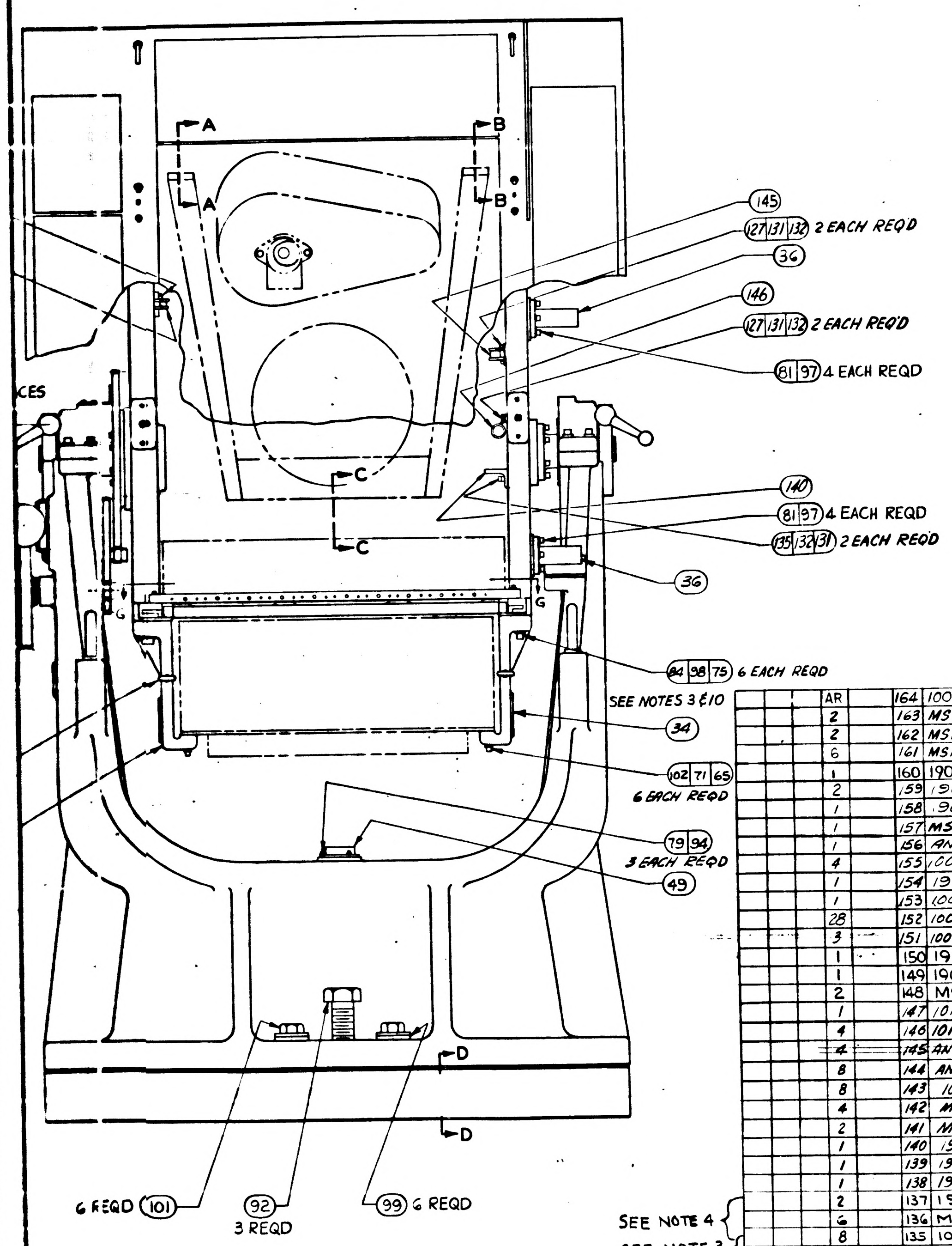
PARTIAL SECTION E-E
SCALE 1:2

1900014 SH 1

MIL FORM 1050 J3

1/1900014

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
REVISIONS					
C	-	REPLACES REV B WITH CHANGE PER MXC-190286. REVISED PER TDR 04045	-	24 SEP 63	RJM
D		CHANGE IN ACCORDANCE WITH MXC-190917		10 JAN -64	MEM
E		CHANGE IN ACCORDANCE WITH MXC 191288 TDRR 07455		13 JAN -63	MEM
F		CHANGE IN ACCORDANCE WITH CM 193750 TDRR 07456		13 JAN 64	JJ MEM
G		CHANGE IN ACCORDANCE WITH CM-194738 TDRR 07457		3 FEB 64	MEM
H		CHANGE IN ACCORDANCE WITH CM 194866 REVISED PER TDR [illegible]		26 FEB 64	
J		CHANGE IN ACCORDANCE WITH CM 196276 TDRR 09224		23 APR 64	J.C
K		CHANGE IN ACCORDANCE WITH CM-196929 PER TDRR 09225		13 MAY 64	BK MEM
L		CHANGE IN ACCORDANCE WITH CM 197337 PER TDRR 10823		22 MAY 64	EM
M		CHANGE IN ACCORDANCE WITH CM 197475 PER TDRR 10824		11 JUNE 64	BK
N		CHANGE IN ACCORDANCE WITH CM 197506 PER TDRR [illegible]		16 JUNE 64	BK
P		CHANGE IN ACCORDANCE WITH CM 197639 [illegible]		23 JUNE 64	DGS
R		CHANGE IN ACCORDANCE WITH CM 199763 REVISED PER TDRR 14931		2 SEP 64	J.K
S	-	CHANGED IN ACCORDANCE WITH CM 302702 TDRR 14932	-	22 SEPT 64	T.R
T	-	REVISED PER TDRR 14921	-	22 DEC 64	JJJ



				011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				2		133	1015831-249	SCREW-FLAT HD. HEX. SOC
				46		132	MS-35338-80	WASHER-LOCK
SEE NOTE 4				52		131	AN960-C-8L	(1897006-038) WASHER FLAT
				8		130	AN960-C-4	(1897006-024) WASHER FLAT
				~~2~~		~~129~~	~~MS-16995-55~~	~~SCREW-CAP~~
SEE NOTE 3				6		128	1015826-296	SCREW-FL.HD.
SEE NOTE 3				14		127	1006783-27	SCREW-BUTTON HD
SEE NOTE 3				8		126	1006783-20	SCREW, BUTTON HD.
				4		125	MS-16996-14	SCREW-CAP SOC. HD.
				4		124	AN535-0-4	SCREW-DRIVE
				1		123	1900874	CAP-TOE, GSE, PSA.
				1		122	1901348	BRACKET-SUPPORT R.H.
				1		121	1901347	BRACKET-SUPPORT L.H.
				1		120	1900939	PINION-CHANGE GEAR
				1		119	1900938	WASHER
				1		118	1900937	WASHER-STEP
				1		117	1900936	SPACER
				1		116	MS-16624-4075	RING-RETAINING
				1		115	1900940	BUSHING-COMPOUND
				1		114	1900935	WASHER-FLAT
SEE NOTE 3				2		113	1000159-6	PACKING, PREFORMED O-RING
SEE NOTE 3				1		112	1016019-004	COUPLING HALF, QUICK-DISCONNECT
SEE NOTE 3				1		111	1016238-001	COUPLING HALF, QUICK-DISCONNECT
				1		110	1015424	COLDPLATE, CDU
GFP				1		109	1901821	COLDPLATE, PSA, TYPE 014 (INSEP ASSY)
				1		108	1901304-211	PLATE, IDENTIFICATION
				12		107	AN960C6L	(1897006-036 WASHER-FLAT
				1		106	NAS1408C8	(1896868-108) NUT-SELF LOCKING
SEE NOTE 4				6		105	AN526C1032R8	(1897083-258) SCREW-TRUSS HD.
				1		104	1900590	GUARD AND SEAL ASSY
				1		103	1900552	RACK
SEE NOTE 4				6		102	MS-16995-68	SCREW, HEX SOC
				6		101	MS35305-240	SCREW, CAP
SEE NOTE 3				14		100	1016093-001	PIN-STEP DOWEL
SEE NOTE 3				6		99	1016095-007	WASHER-SPHERICAL
				7		98	MS35338-84	WASHER-LOCK, SPLIT
				59		97	MS35338-82	WASHER-LOCK, SPLIT
				33		96	MS35338-81	WASHER-LOCK, SPLIT
				4		95	MS35338-79	WASHER-LOCK, SPLIT
				11		94	MS35338-78	WASHER-LOCK, SPLIT
				9		93	MS35305-242	SCREW, CAP
				3		92	MS35300-316	SCREW, CAP
				4		91	MS35216-25	SCREW, MACHINE, PAN HD
				1		90	MS24692-162	PIN-TAPER
				1		89	MS24692-189	PIN-TAPER
				2		88	MS24692-108	PIN-TAPER
				~~2~~		~~87~~	~~MS16998-62~~	~~SCREW-HEX SOC~~
				3		86	MS16998-50	SCREW-HEX SOC
				24		85	MS16996-12	SCREW, CAP
				6		84	MS16995-84	SCREW, CAP
				6		83	MS16995-67	SCREW, CAP
				24		82	MS16995-53	SCREW, CAP
				27		81	MS16995-52	SCREW, CAP
				4		80	MS16995-37	SCREW, CAP
				9		79	MS16995-11	SCREW, CAP
				3		78	MS16556-104	PIN-STRAIGHT
				2		77	MS16556-101	PIN-STRAIGHT
				4		76	MS16555-648	PIN-STRAIGHT
				6		75	MS15795-315	WASHER, FLAT
				9		74	MS15795-126	WASHER, FLAT
				3		73	AN960C816	(1897006-082) WASHER-FLAT
				2		72	AN363C524	(1896990-051) NUT-SELF LOCKING
SEE NOTE 4				14		71	AN960C516	(1897006-052) WASHER-FLAT
				16		70	AN960C416	(1897006-042) WASHER-FLAT
SEE NOTE 4				17		69	AN960C10	(1897006-017) WASHER-FLAT
SEE NOTE 3				2		68	1015916-001	BOLT-EYE
				2		67	NAS70V328-563	WASHER-FIBRE
				6		66	1899979	WASHER-BELLEVILLE
				12		65	MS-35338-83	WASHER-LOCK
				1		64	1900970-011	INSERT-BALL MOUNT ASSY, LINE
				1		63	1900581	PAD
				1		62	1900969-011	INSERT-BALL MOUNT ASSY, PLANE
				1		61	1900580	MOUNT-BALL
				2		60	1900583	SPACER-BALL MOUNT
				3		59	1900962	COLLAR-CENTERING
				2		58	1900582	PAD
				1		57	1900968	INSERT-BALL MOUNT. STAT.
				3		56	1900972	INSERT
				3		55	1900963	BALL-PRECISION
				2		54	MS-171537	PIN-SPRING
				2		53	MS-171536	PIN-SPRING
				1		52	MS-24585-C499	1897067-499) SPRING
				1		51	MS171600	PIN, SPRING
				2		50	1900624	SHAFT-TRUNNION
SEE NOTE 3				1		49	1016129-010	LEVEL-CIRCULAR MOUNTED
				1		48	MS-16624-4075	RING, RETAINING
				~~2~~		~~47~~	~~1901622-002~~	~~BEARING THRUST~~
				1		46	MS-17796-112	BEARING-SLEEVE
				1		45	1901369	PAD. THERMAL INTERFACE
SEE NOTE 3				4		44	1015916-003	BOLT-EYE
				2		43	1900632	KNOB, FINE ADJUST
				~~1~~		42	~~MS-17796-98~~	~~BEARING, SLEEVE~~
				1		41	MS-17796-89	BEARING, SLEEVE
				~~1~~		40	~~MS-17796-77~~	~~BEARING, SLEEVE~~
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

				011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				AR		164	1006879	SILICONE COMPOUND, THERMOCONDUCTIVE
				2		163	MS16998-60	SCREW, HEX. SOC.
				2		162	MS16995-54	SCREW, HEX SOC.
				6		161	MS16995-67	SCREW, HEX SOC
				1		160	1901687	PLATE-INSTRUCTION
				2		159	1901673	BLOCK-SUPPORT CLAMP
				1		158	1901672	BUS BAR
				1		157	MS35690-410	NUT-HEX PLAIN
				1		156	AN960C616	(1897006-062) WASHER-FLAT
				4		155	1006783-47	SCREW-BUTTON HD., HEX SOC.
				1		154	1901685	STUD-GROUND
				1		153	1006783-51	SCREW-BUTTON HD., HEX SOC.
				28		152	1006783-26	SCREW-BUTTON HD., HEX SOC.
				3		151	1006783-44	SCREW BUTTON HD, HEX SOC.
				1		150	1901667-001	WASHER, THRUST
				1		149	1901668-001	WASHER, THRUST
				2		148	MS171493	PIN, ROLL
				1		147	1010400-1	CLAMP-LOOP HINGED
				4		146	1010400-3	CLAMP-LOOP HINGED
				~~4~~		~~145~~	~~AN363C832~~	~~(1896990-281) NUT-SELF LOCKING~~
				8		144	AN363C632	(1896990-261) NUT-SELF LOCKING
				8		143	1006783-23	SCREW-BUTTON HD. HEX SOC.
				4		142	MS16995-50	SCREW-CAP
				2		141	MS16995-28	SCREW-CAP
				1		140	1901650	BRACKET-CONN., ELEC
				1		139	1901643	GUARD-HARNESS
				1		138	1901639	BRACKET-CONN., ELEC.
SEE NOTE 4				2		137	1901594	SCREW-SHOULDER
SEE NOTE 4				6		136	MS-16996-16	SCREW-CAP
SEE NOTE 3				8		135	1006783-29	SCREW-BUTTON HD. HEX. SOC.
SEE NOTE 3								
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. [illegible] DATE

©| REPLACES REV "B" WITH CHANGE

				011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				2		39	MS-172211	WASHER, KEY, BEARING RETAINING
				2		38	MS-172246	NUT, SPANNER
				2		37	1016083-001	BEARING-BALL, DUPLEX PAIR
				2		36	1900571	SHAFT, STOP
				1		35	1900716	BRACKET, MOUNTING (L.H.)
				1		34	1900715	BRACKET, MOUNTING (R.H)
				1		33	1900706	CRADLE, FIXTURE (INSEPARABLE) ASSEMBLY
				1		32	1900776	WORM R.H.
				1		31	1900724	HANDWHEEL
				1		30	1900723	WASHER
				1		29	1900722	GEAR, INTERMEDIATE
				1		28	1900721	GUIDE, SPRING
				1		27	1900720	WASHER, SPRING
				1		26	1900647	PINION
				1		25	1900646	COVER-WORM
				1		24	1900645	SHIM, LAMINATED
				1		23	1900644	BRACKET, WORM
				1		22	1900643	SHAFT, WORM, FINE ADJUST
				1		21	1900642	KNOB (INSEPARABLE) ASSEMBLY
				1		20	1900641	WASHER, THRUST
				1		19	1900640	GEAR-WORM R.H.
				1		18	1900639	SHAFT, COARSE ADJUST
				2		17	1901370	CLAMP THERMAL INTERFACE MATL
				1		16	1900637	SHAFT, GEAR
				1		15	1900636	POINTER-INDEX
				1		14	1900635	GEAR-OUTPUT
				1		13	1900634	CAP, BEARING
				1		12	1900633	CAP, BEARING
				2		11	1900725	LEVER, SHAFT LOCK
				1		10	1900631	WASHER, THRUST
				1		9	1900630-002	SHAFT, SHAFT LOCK (L.H.)
				1		8	1900630-001	SHAFT, SHAFT LOCK (R.H.)
				1		7	1900629	LOCK-SHAFT (L.H.)
				1		6	1900628	LOCK-SHAFT (R.H.)
				1		5	1900627	RETAINER, BEARING
				1		4	1900626	RETAINER, BEARING
				2		3	1900625	CARTRIDGE, BEARING
				1		2	1900622	RING-BASE
				1		1	1900621	G AND N FIXTURE BASE SET (MATCHED)
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

SHEET 1	SHEET 2
T	R
~~S~~	R
R	R

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2
P	L
N	L
M	L
L	L
K	K
J	J

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2
H	E
G	E
F	E
E	E
D	C
C	C

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO
1900030	1900030	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE. WISCONSIN
ACSP PN
DRAWN Schwabe DATE 19 MAR 63
CHECKED 16 SEP 63
APPROVAL 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

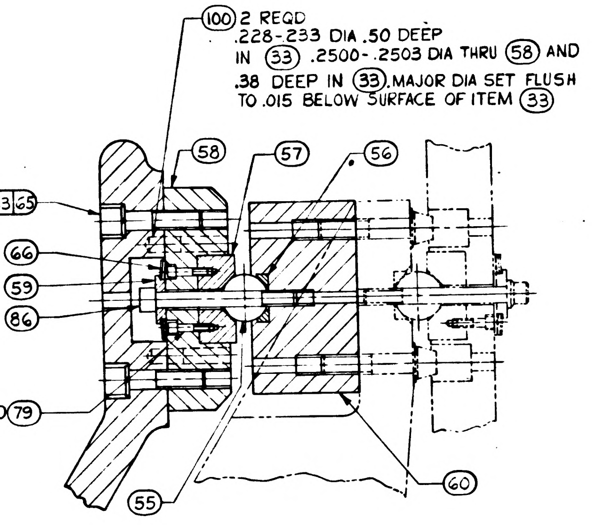
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

G & N MOUNTING FIXTURE ASSEMBLY

CODE IDENT NO. SIZE J3 1900014
SCALE 1:4 SHEET 1 OF 2

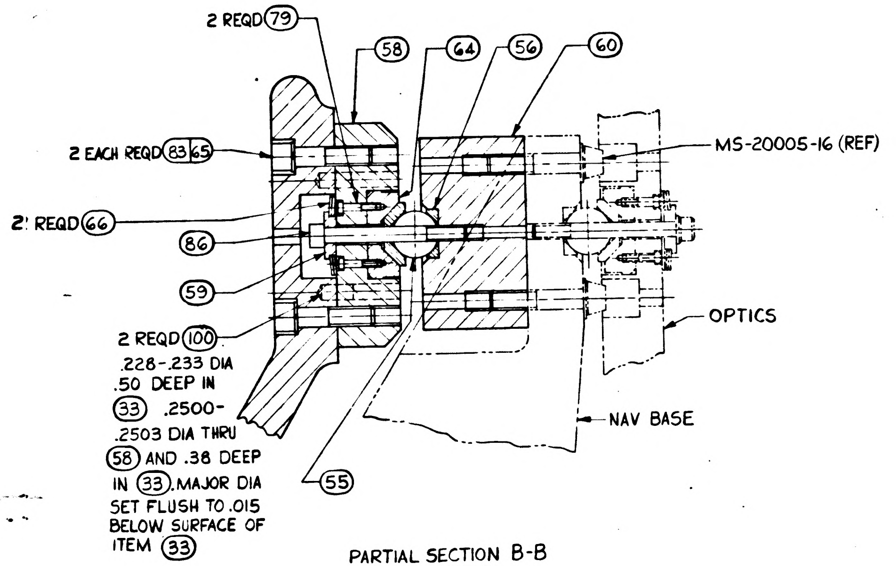
2 EACH REQD

REQD



(100) 2 REQD
.228-.233 DIA .50 DEEP
IN (33) .2500-.2503 DIA THRU (58) AND
.38 DEEP IN (33) MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (33)
(58)
(57)
(56)
2 EACH REQD (83)(65)
2 REQD (66)
(59)
(86)
2 REQD (79)
(55)
(60)

PARTIAL SECTION A-A
FULL SCALE

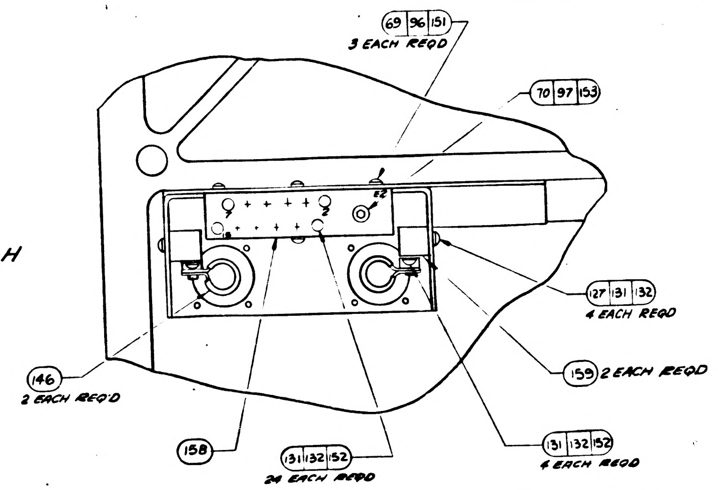


2 REQD (79)
(58)
(64)
(56)
(60)
2 EACH REQD (83)(65)
MS-20005-16 (REF)
2 REQD (66)
(86)
(59)
2 REQD (100)
.228-.233 DIA
.50 DEEP IN
(33) .2500-
.2503 DIA THRU
(58) AND .38 DEEP
IN (33) MAJOR DIA
SET FLUSH TO .015
BELOW SURFACE OF
ITEM (33)
(55)
OPTICS
NAV BASE

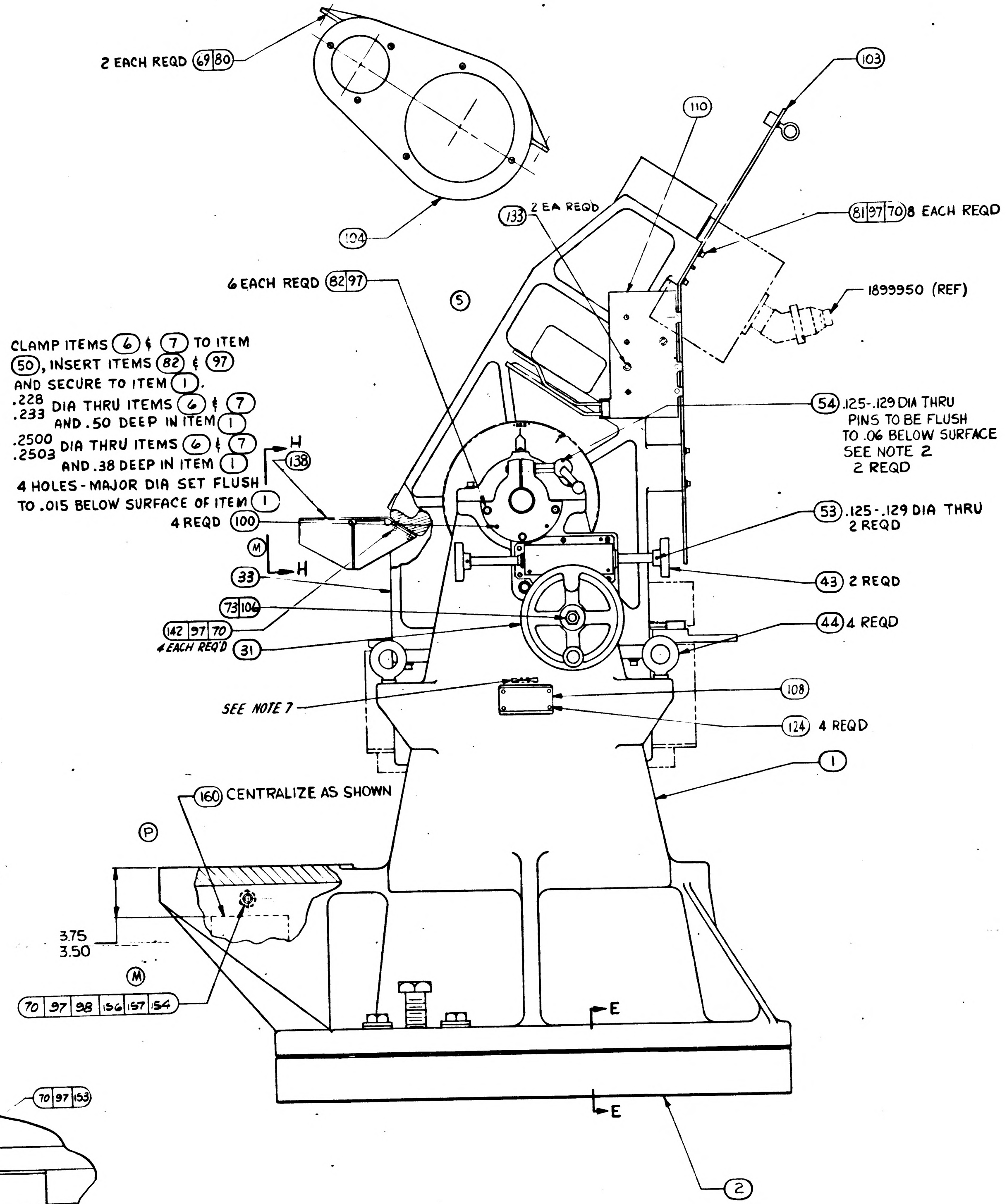
PARTIAL SECTION B-B
FULL SCALE

(M)

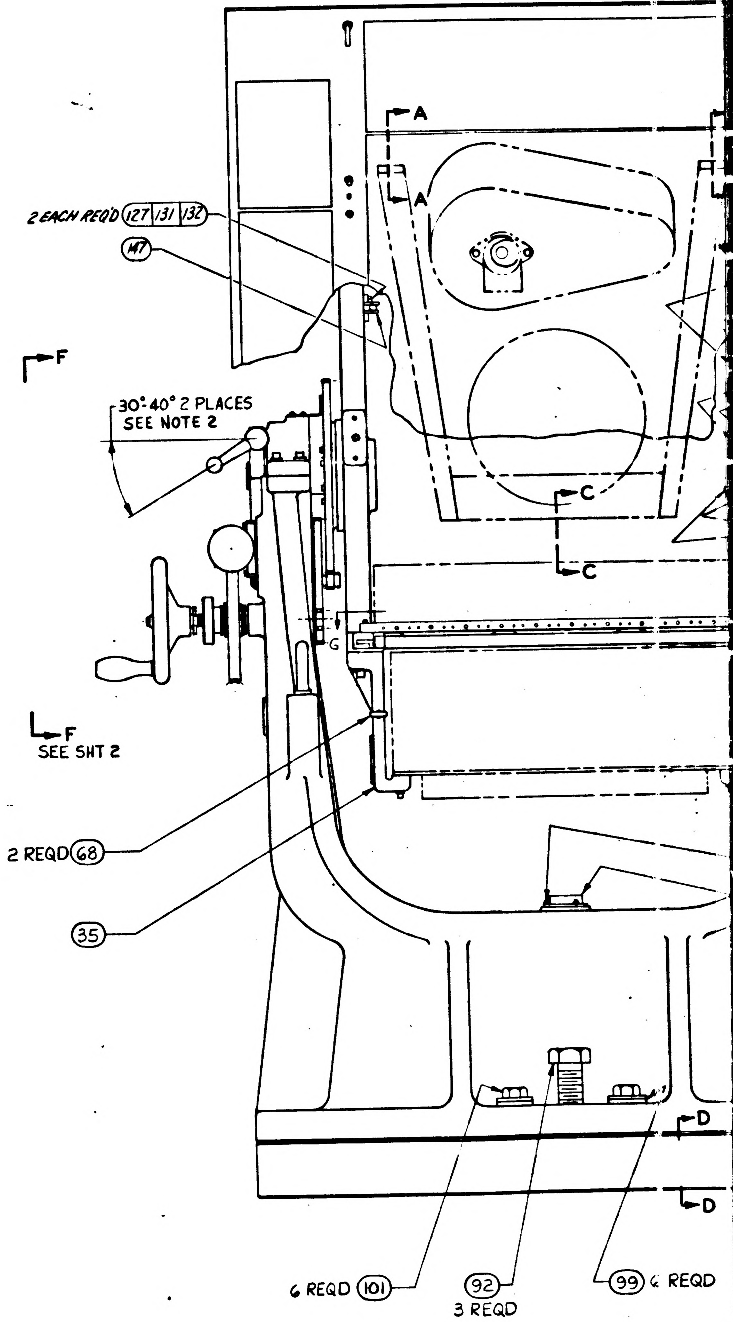
PARTIAL VIEW H-H
SCALE 1:2



(69)(96)(151)
3 EACH REQD
(70)(97)(153)
(27)(31)(32)
4 EACH REQD
(159) 2 EACH REQD
(146)
2 EACH REQ'D
(158)
(131)(132)(52)
24 EACH REQD
(131)(132)(52)
4 EACH REQD



2 EACH REQD (69)(80)
(103)
(110)
(104)
(133) 2 EA REQD
(81)(97)(70) 8 EACH REQD
6 EACH REQD (82)(97)
(5)
1899950 (REF)
CLAMP ITEMS (6) & (7) TO ITEM
(50), INSERT ITEMS (82) & (97)
AND SECURE TO ITEM (1).
.228
.233 DIA THRU ITEMS (6) & (7)
AND .50 DEEP IN ITEM (1)
.2500
.2503 DIA THRU ITEMS (6) & (7)
AND .38 DEEP IN ITEM (1)
4 HOLES-MAJOR DIA SET FLUSH
TO .015 BELOW SURFACE OF ITEM (1)
4 REQD (100)
H
(138)
(M)
(33)
H
(73)(106)
(142)(97)(70)
4 EACH REQD (31)
(54) .125-.129 DIA THRU
PINS TO BE FLUSH
TO .06 BELOW SURFACE
SEE NOTE 2
2 REQD
(53) .125-.129 DIA THRU
2 REQD
(43) 2 REQD
(44) 4 REQD
(108)
(124) 4 REQD
SEE NOTE 7
(1)
(160) CENTRALIZE AS SHOWN
(P)
3.75
3.50
(M)
(70)(97)(98)(156)(157)(54)
E
E
(2)



A
A
2 EACH REQD (127)(131)(132)
(M7)
F
30°-40° 2 PLACES
SEE NOTE 2
C
C
G
F
SEE SHT 2
2 REQD (68)
(35)
D
D
6 REQD (101)
(92)
3 REQD
(99) 4 REQD

00014 SH 1

1900014 SH 1

27 1900014

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. PIN ⑪ TO ⑧ OR ⑨ AS INDICATED WHILE FIXTURE IS IN LOCKED POSITION.

3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

4. THE FOLLOWING ITEMS SHALL BE FURNISHED AS LOOSE PARTS WITH THIS ASSEMBLY. THE CONFIGURATION OF THESE ITEMS IS NOT SHOWN.

QUAN.	ITEM NO
10	69
6	71
6	161
6	105
6	131
6	135
6	136
2	137
2	94
8	107
2	126
2	130
8	143
8	144
4	155

5. INSTALLATION OF QUICK DISCONNECT COUPLING HALVES.
   A. APPLY A THIN FILM OF DOW-CORNING LUBRICANT NO. 55 (MIL-L-4343A) TO ENTIRE SURFACE OF ITEM (113).
   B. INSTALL ITEM (111) AND (112) WITH A TORQUE OF 65-75 IN-LB.

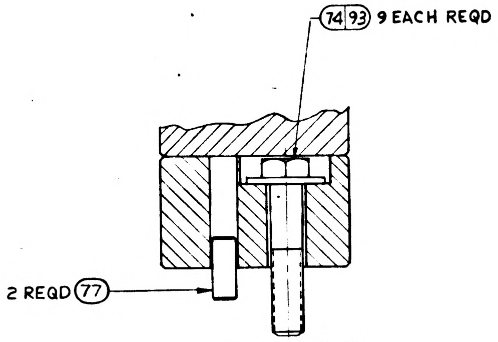
6. APPLY A LIGHT COATING OF MIL-L-6085 OIL TO ALL SLIDING SURFACES OF PARTS INDICATED.

7. MARK APPLICABLE REVISION LETTER (REV. ___) PER ND 1002019, .12 HIGH, COLOR BLACK, CENTRALIZED .12 ABOVE ITEM 108.

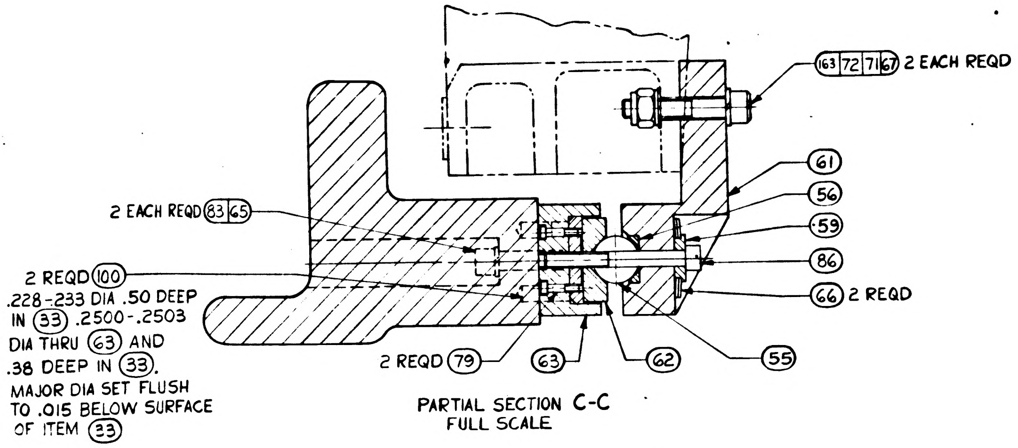
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. ON ITEM 108 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .12 HIGH.

9. APPLY MIL-G-3278(ES-134) MATING THREADS AND SURFACES BETWEEN ITEMS ⑦, ⑨ AND (73); ⑥, ⑧ AND (73).

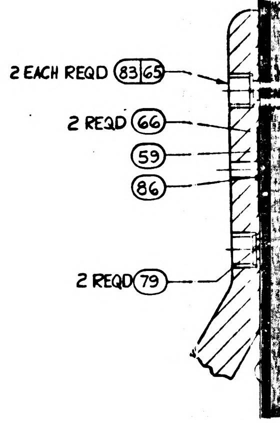
10. APPLY A LIGHT COATING OF ITEM (164) TO CONTACT SURFACE BETWEEN ITEMS (45) AND (109)

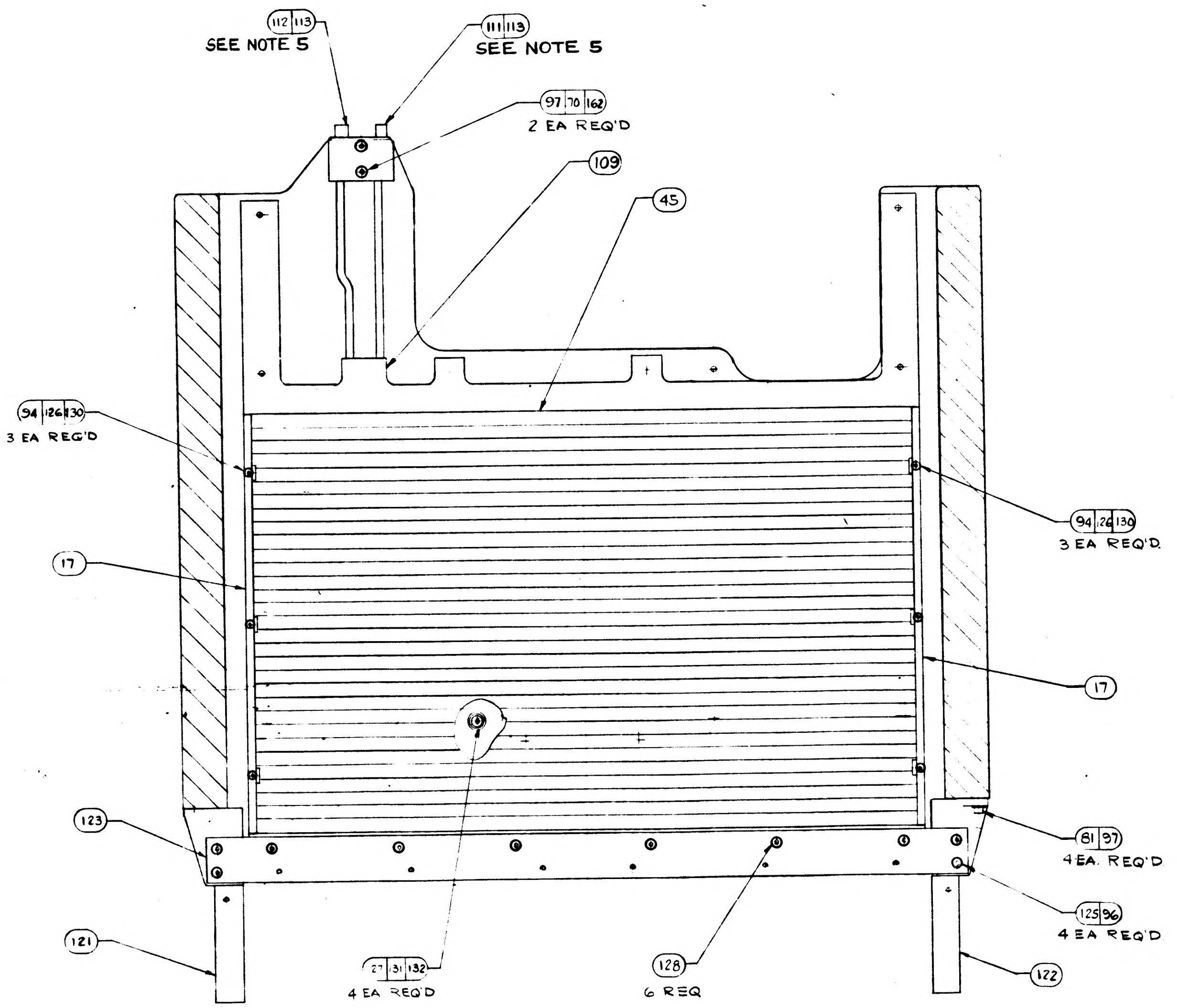

(74|93) 9 EACH REQD
2 REQD (77)

PARTIAL SECTION D-D
SCALE 1:2

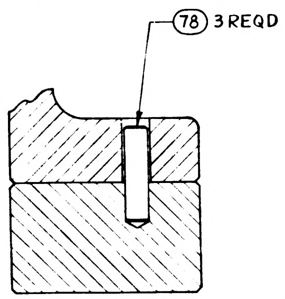

(163|72|71|67) 2 EACH REQD
2 EACH REQD (83|65)
2 REQD (100)
.228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (63) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
(61)
(56)
(59)
(86)
(66) 2 REQD
2 REQD (79)
(63)
(62)
(55)

PARTIAL SECTION C-C
FULL SCALE

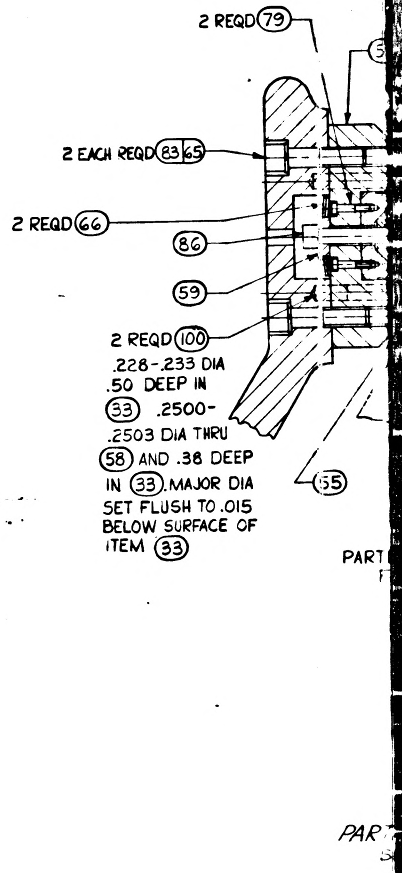

2 EACH REQD (83|65)
2 REQD (66)
(59)
(86)
2 REQD (79)


(112|113) SEE NOTE 5
(111|113) SEE NOTE 5
(97|70|162) 2 EA REQ'D
(109)
(45)
(94|126|130) 3 EA REQ'D
(94|126|130) 3 EA REQ'D
(17)
(17)
(123)
(81|97) 4 EA. REQ'D
(125|96) 4 EA REQ'D
(121)
(27|131|132) 4 EA REQ'D
(128) 6 REQ
(122)

VIEW G-G
(SCALE 1:2)



PARTIAL SECTION E-E
SCALE 1:2


2 REQD (79)
2 EACH REQD (83|65)
2 REQD (66)
(86)
(59)
2 REQD (100)
.228-.233 DIA .50 DEEP IN (33) .2500-.2503 DIA THRU (58) AND .38 DEEP IN (33). MAJOR DIA SET FLUSH TO .015 BELOW SURFACE OF ITEM (33)
(55)

PART

PAR

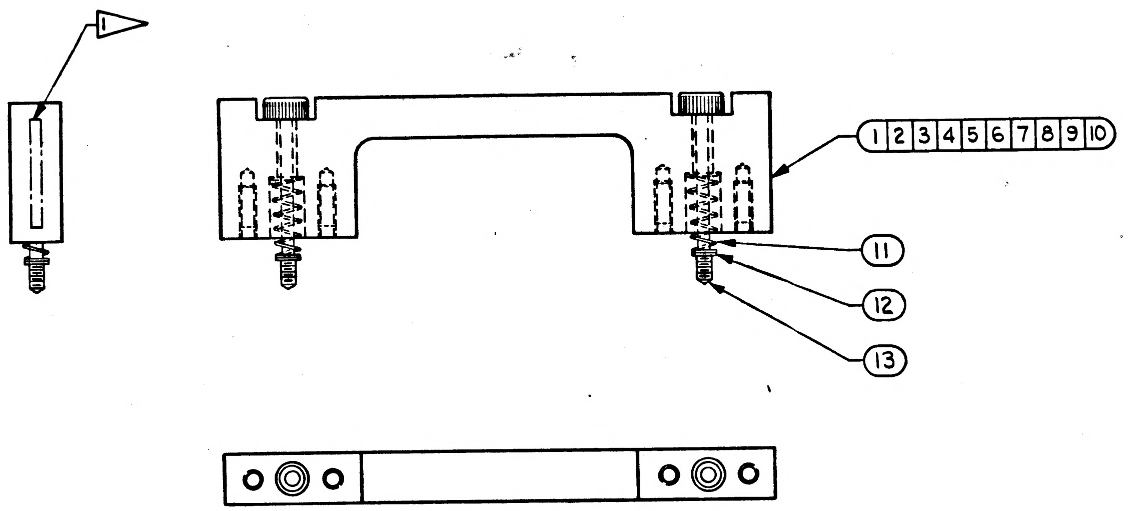
1900014	SH 1

MIL FORM 1950 J3

1/1900014

1900015

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	B-2 B-2 B-2	ADDED IT. 11, 1015828-1 ADDED IT. 12, 1015829-1 ADDED IT 13. 1015830-1	MIC 186174	6 APR 63	
		PER TDRR 03719		8 [illegible] 63	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 MARKING:
STENCIL 1900015 AND APPLICABLE DASH NO. IN 1/8 CHARACTERS, BLACK, COVER WITH CLEAR FLAT LACQUER TT-L-58,(ES-2562) PER MIL-STD-130 (ES-267-10).

101	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	2	2	2	2	2	2	2	2	1		13	1015830-1	SCREW-THUMB, CROSS RECESSED
2	2	2	2	2	2	2	2	2	1		12	1015829-1	WASHER, RETAINER
2	2	2	2	2	2	2	2	2	1		11	1015828-1	SPRING, COMPRESSION COIL
1											10	1900017-10	HANDLE (INSEPARABLE ASSY)
	1										9	-9	
		1									8	-8	
			1								7	-7	
				1							6	-6	
					1						5	-5	
						1					4	-4	
							1				3	-3	
								1			2	-2	
									1		1	1900017-1	HANDLE (INSEPARABLE ASSY)

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN R. Tamsen 28 MAR 63
CHECKED 5 APR 63
APPROVAL 8 APR 63
APPROVAL 10 APR 63

NASA APPROVAL
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

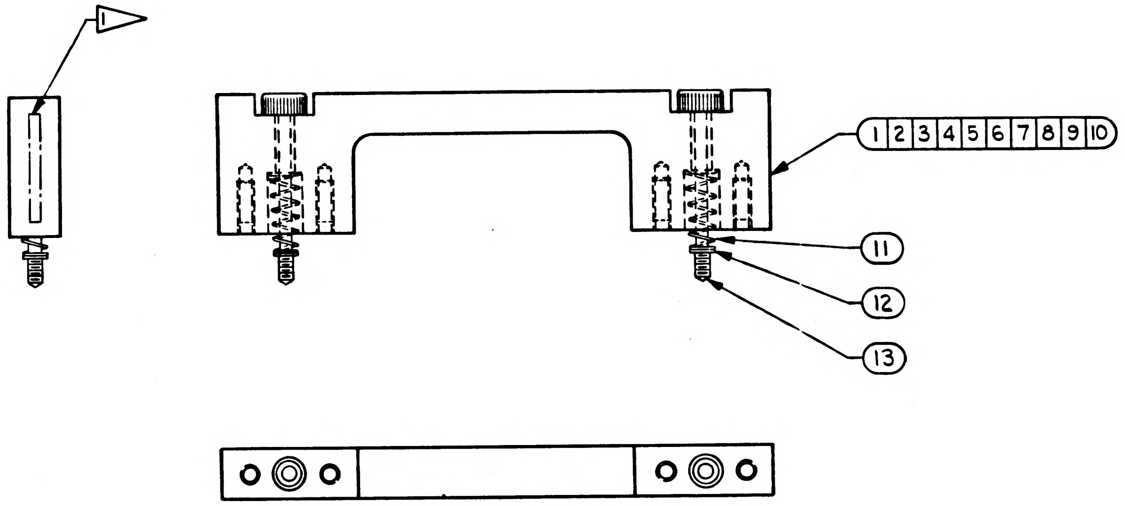
HANDLE
ASSEMBLY

CODE IDENT NO.
SIZE D
1900015
SCALE —
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900015

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 MARKING:
STENCIL 1900015 AND APPLICABLE DASH NO. IN 1/8 CHARACTERS, BLACK, COVER WITH CLEAR FLAT LACQUER TT-L-58,(ES-2562) PER MIL-STD-130(ES-267-10).

101	091	081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2	2	2	2	2	2	2	2	2	1		13		SCREW
2	2	2	2	2	2	2	2	2	1		12		RETAINER
2	2	2	2	2	2	2	2	2	1		11		SPRING
1											10	1900017 -10	HANDLE (INSEPARABLE ASSY)
	1										9	-9	
		1									8	-8	
			1								7	-7	
				1							6	-6	
					1						5	-5	
						1					4	-4	
							1				3	-3	
								1			2	-2	
									1		1	1900017 -1	HANDLE (INSEPARABLE ASSY)

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 28 MAR 63
5 APR 63
CHECKED 8 APR 63
APPROVAL
APPROVAL 10 APR 63
NASA APPROVAL
J.P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

HANDLE
ASSEMBLY

CODE IDENT NO.
SIZE D
1900015
SCALE —
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	D3,D4 C3,C4	Ⓐ CHG DRAWER SIZES & ADDED TITLES SHT 1.	D.O. 51522	2 MAY 62	FK
B		CHANGED TO CONFORM WITH DETAILS-CHANGED DRAWER SIZES, REVISED TITLES & ADDED REF DESIGNATIONS	D.O. 51804	30-JUL-63	

1. CONNECT GROUND CABLE TO GROUND STUD E AND FACILITY GROUND POINT BEFORE CONNECTING POWER CABLE TO CONSOLE.
2. WEIGHT & CENTER OF GRAVITY DATA: (INDICATED BY ⊕)

	WEIGHT		X	Y	Z
CABINET ONLY (IN CONDITION FOR SHIPMENT BUT WITHOUT SHIPPING CONTAINER) (APPROX)	1764 LBS		52	$29\frac{3}{8}$	16
COMPLETE UNIT (AS SHOWN)					

3. HOISTING OF UNIT TO BE ACCOMPLISHED ONLY THRU USE OF LIFT TRUCK SLOTS PROVIDED IN BASE
4. UNLESS CONSOLE BASE IS FIRMLY ATTACHED TO A RIGID FLOOR, OVERTURN COULD RESULT WHEN 50% OF THE DRAWERS ARE EXTENDED.
5. RECOMMENDED MOUNTING HARDWARE - NOT FURNISHED WITH UNIT.

INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.

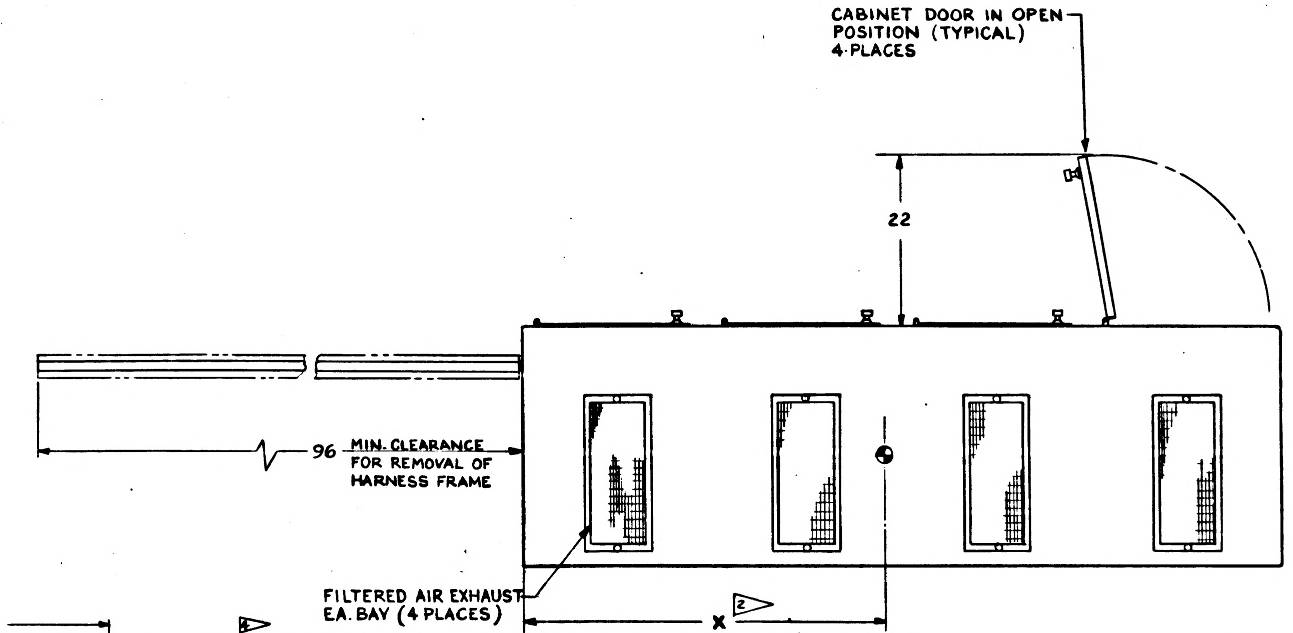
DIMENSIONS WITHOUT TOLERANCE - FOR REFERENCE ONLY.

OPERATIVE AMBIENT TEMPERATURE LIMIT 50°F TO 85°F (CONTINUOUS DUTY).

ELECTRICAL CONNECTOR DATA:

REF. DESIG.	PART NO	REF. DESIG.	PART NO.
J1	MS3127E-16-8S	J18	1015906-104
J2	-20-41S	J19	MS3127E-22-55P
J3	-22-55S	J20	-22-55PW
J4	-20-41SW	J21	-22-55PX
J5	-24-61P	J22	-22-55SW
J6	-24-61PW	A30J1	MS3102E-22-22P
J7	-24-61PX	A30J2	MS3102E-32-6S
J8	1015906-100	E1	3/8 STUD
J9	1015906-101		
J10	MS-3127E-24-61S		
J11	-24-61SW		
J12	-24-61PY		
J13	1015906-102		
J14	MS3127E-24-61PZ		
J15	-24-61SX		
J16	-24-61SY		
J17	1015906-103		

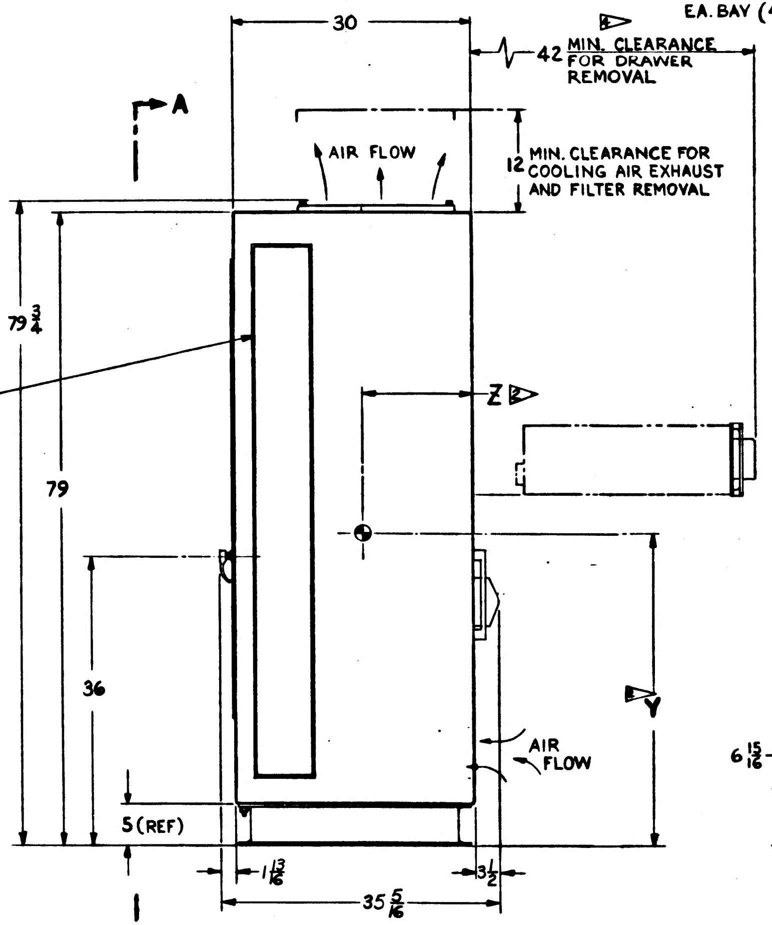
REFERENCE:
OPTICS-INERTIAL ANALYZER 1900004
CABINET ASSEMBLY, BASIC 1900007


CABINET DOOR IN OPEN POSITION (TYPICAL) 4-PLACES
22
96 MIN. CLEARANCE FOR REMOVAL OF HARNESS FRAME
FILTERED AIR EXHAUST EA. BAY (4 PLACES)
X 2

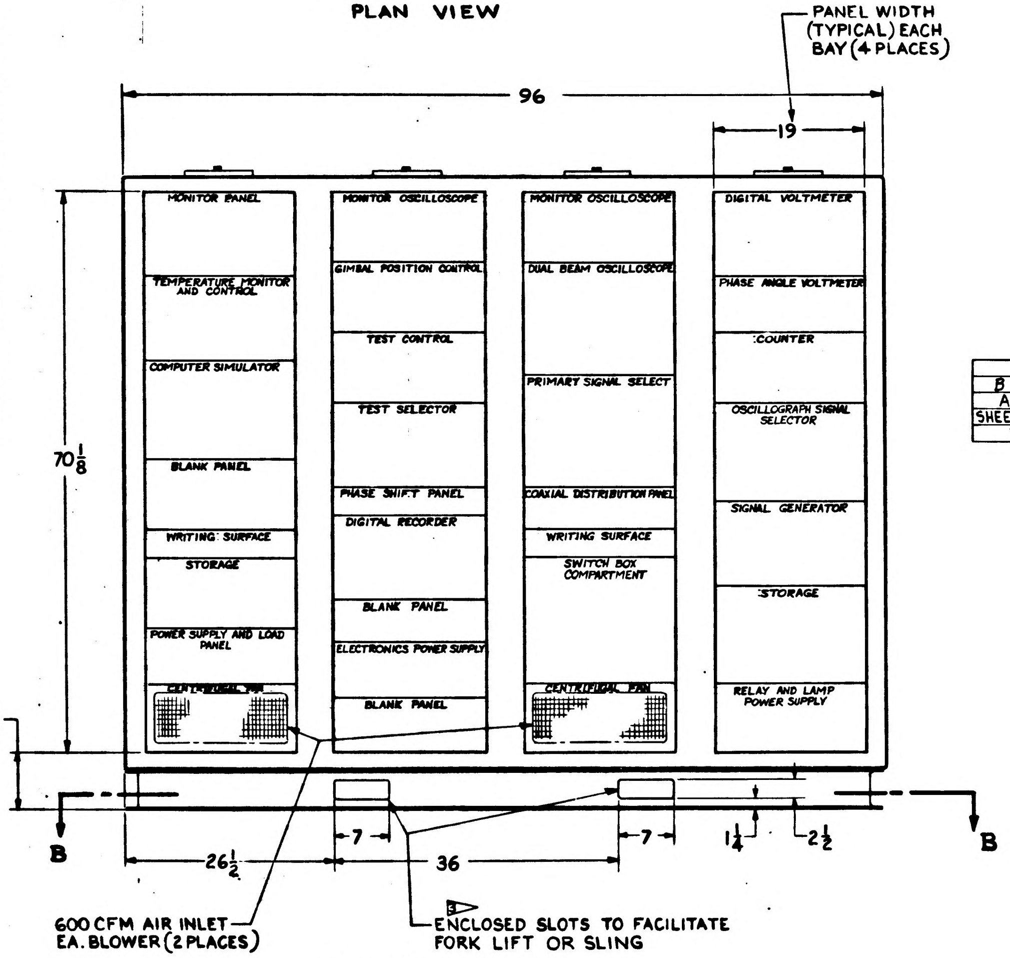
PLAN VIEW

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02564 DATE 14 AUG 63

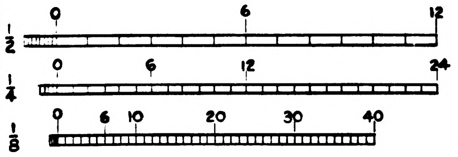

30
4 42 MIN. CLEARANCE FOR DRAWER REMOVAL
A
AIR FLOW
12 MIN. CLEARANCE FOR COOLING AIR EXHAUST AND FILTER REMOVAL
REMOVABLE PANEL TO FACILITATE REMOVAL OF HARNESS FRAME -THIS SIDE ONLY.
$79\frac{3}{4}$
79
Z 2
36
2 Y
AIR FLOW
5 (REF)
$1\frac{13}{16}$
$3\frac{1}{2}$
$35\frac{5}{16}$
A

LEFT SIDE ELEVATION


PANEL WIDTH (TYPICAL) EACH BAY (4 PLACES)
96
19
MONITOR PANEL
TEMPERATURE MONITOR AND CONTROL
COMPUTER SIMULATOR
BLANK PANEL
WRITING SURFACE
STORAGE
POWER SUPPLY AND LOAD PANEL
CENTRIFUGAL FAN
MONITOR OSCILLOSCOPE
GIMBAL POSITION CONTROL
TEST CONTROL
TEST SELECTOR
PHASE SHIFT PANEL
DIGITAL RECORDER
BLANK PANEL
ELECTRONICS POWER SUPPLY
BLANK PANEL
MONITOR OSCILLOSCOPE
DUAL BEAM OSCILLOSCOPE
PRIMARY SIGNAL SELECT
COAXIAL DISTRIBUTION PANEL
WRITING SURFACE
SWITCH BOX COMPARTMENT
CENTRIFUGAL FAN
DIGITAL VOLTMETER
PHASE ANGLE VOLTMETER
COUNTER
OSCILLOGRAPH SIGNAL SELECTOR
SIGNAL GENERATOR
STORAGE
RELAY AND LAMP POWER SUPPLY
$70\frac{1}{8}$
$6\frac{15}{16}$
B
B
$26\frac{1}{2}$
7
36
7
$1\frac{1}{4}$
$2\frac{1}{2}$
600 CFM AIR INLET EA. BLOWER (2 PLACES)
3 ENCLOSED SLOTS TO FACILITATE FORK LIFT OR SLING

FRONT (PANEL) ELEVATION

B	B	
A	—	
SHEET 1	SHEET 2	
REVISION STATUS OF SHEETS		


1/2
0
6
12
1/4
0
6
12
24
1/8
0
6
10
20
30
40

1900004	1900005
NEXT ASSY	USED ON
APPLICATION	

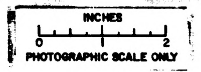
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP P/N
DRAWN W. Diehl DATE 21 MAR 63
CHECKED W. Diehl 12 APR 63
APPROVAL R. Blink 12 APR 63
APPROVAL L. Gelman 8/13/63
NASA APPROVAL W. G. [illegible] 8-14-63
MIT APPROVAL [illegible] 14 Aug 63

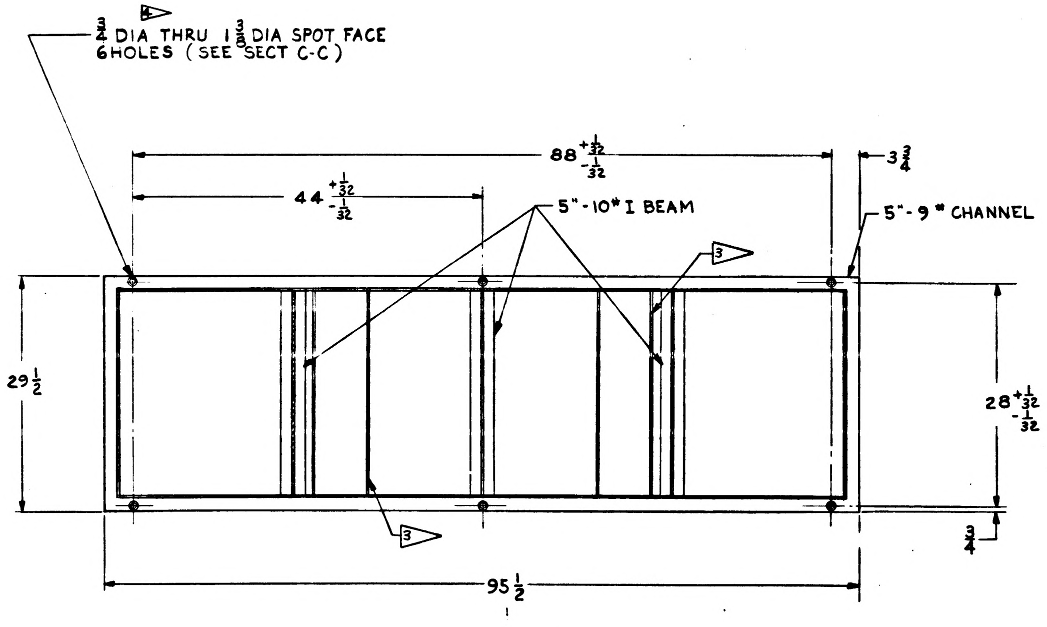
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS-INERTIAL ANALYZER
INSTALLATION DRAWING

CODE IDENT NO
SIZE E 1900016
SCALE 1/8
SHEET 1 OF 2

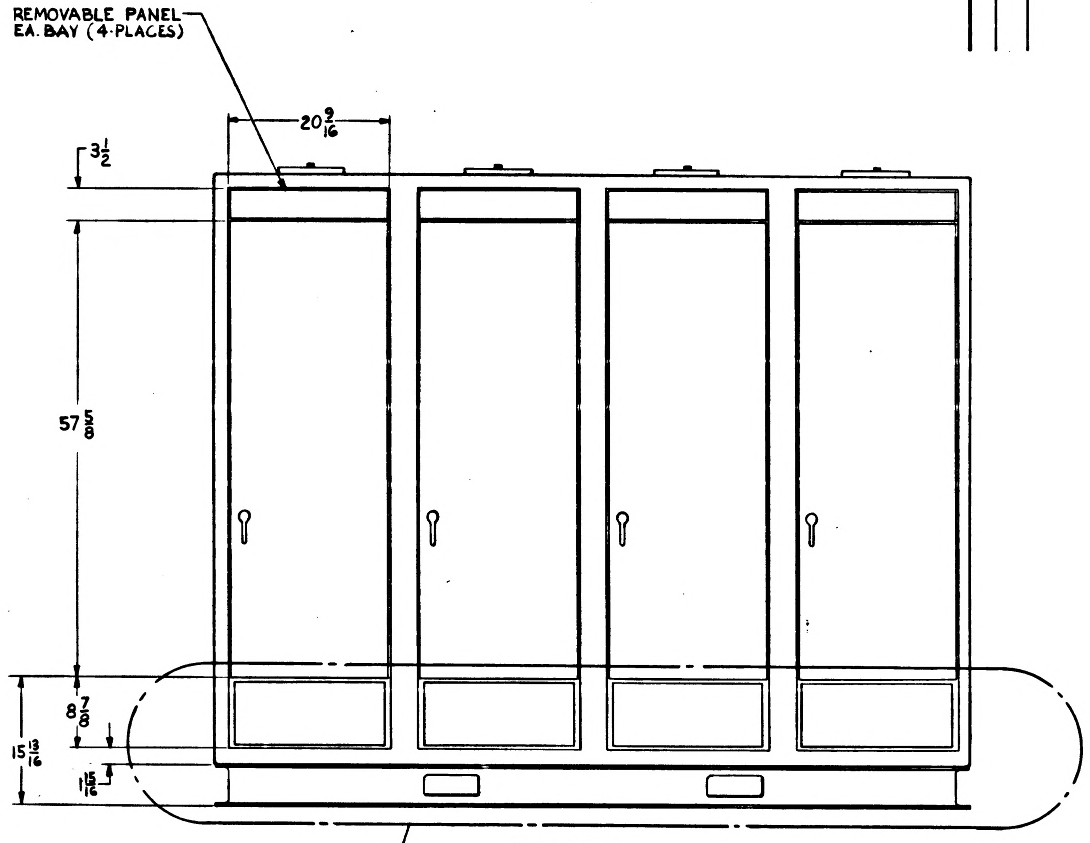

INCHES
0
1
2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B	C-1	(1) REVISED TO CONFORM WITH DETAILS (2) REMOVED PARTIAL SECTION D-D	QQ51804	30-JUL-63	E F



3/32 DIA THRU 1 3/8 DIA SPOT FACE
6HOLES (SEE SECT C-C)
6
88 +1/32 −1/32
−3 3/4
44 +1/32 −1/32
5"-10# I BEAM
5"-9# CHANNEL
3
29 1/2
28 +1/32 −1/32
3
3/4
95 1/2

SECTION B-B

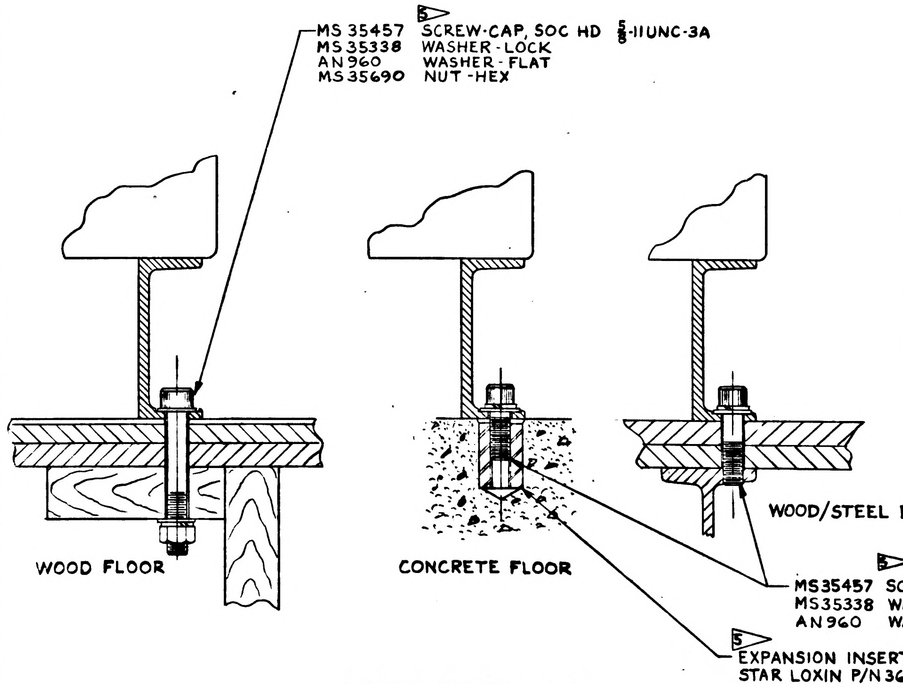


REMOVABLE PANEL
EA. BAY (4-PLACES)
20 9/16
3 1/2
57 5/8
8 7/8
15 13/16
1 15/16

VIEW A-A
(REAR ELEVATION)

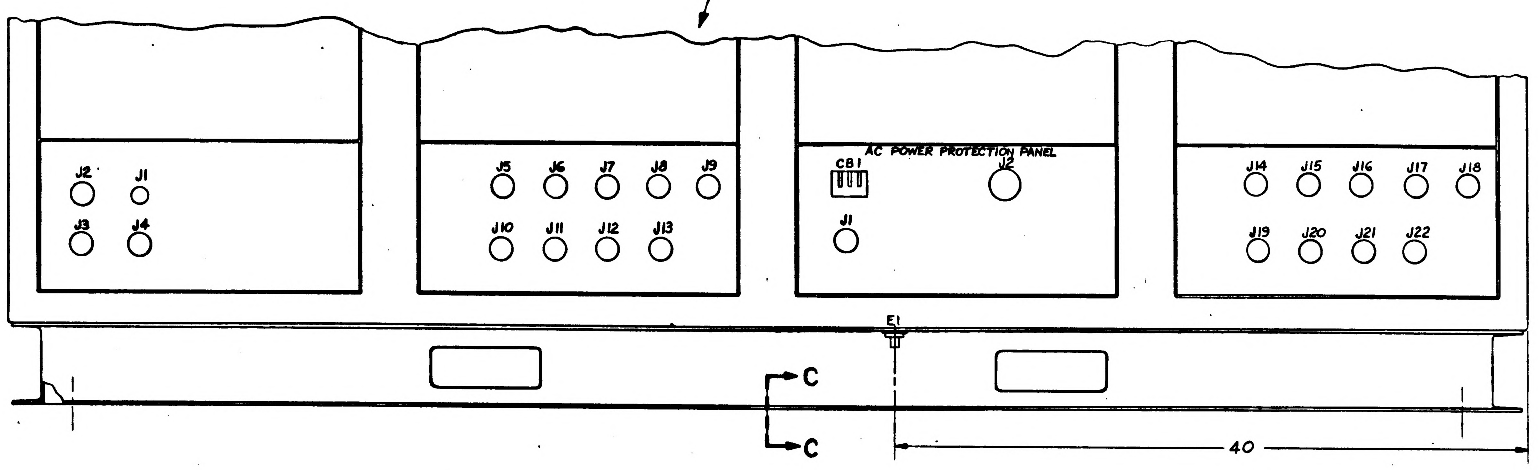
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02564 DATE 14 AUG. 63



5
MS 35457 SCREW-CAP, SOC HD 5/8-11UNC-3A
MS 35338 WASHER-LOCK
AN960 WASHER-FLAT
MS 35690 NUT-HEX
WOOD FLOOR
CONCRETE FLOOR
WOOD/STEEL FLOOR
5
MS35457 SCREW-CAP, SOC HD 5/8-11UNC-3A
MS35338 WASHER-LOCK
AN960 WASHER-FLAT
5
EXPANSION INSERT
STAR LOXIN P/N 3645-3
OR EQUIVALENT

PARTIAL SECTION C-C
(TYPICAL MOUNTING ARRANGEMENTS)
(SCALE 1/2)



J2
J1
J3
J4
J5
J6
J7
J8
J9
J10
J11
J12
J13
AC POWER PROTECTION PANEL
CB1
J2
J1
J14
J15
J16
J17
J18
J19
J20
J21
J22
E1
C
C
40

INTERCONNECTION PANEL DETAIL
(REAR ELEVATION)
(SCALE 1/4)

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − DECIMALS + − ANGLES + − DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION		MATERIAL	DRAWN W.T. [illegible] DATE 12 APR 63 CHECKED W Diehl 12 APR 63 APPROVAL R. [illegible] 12 APR. 63 APPROVAL [illegible] 8/3/63	OPTICS-INERTIAL ANALYZER INSTALLATION DRAWING
		CONTRACT NAS-9-497	NASA APPROVAL [illegible] 8-14-63 MIT APPROVAL [illegible]	CODE IDENT NO. SIZE E 1900016 SCALE 1/8 SHEET 2 OF 2

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A	D3, D4 C3, C4	Ⓐ CHG DRAWER SIZES & ADDED TITLES SHT 1.	D.O. 51522	2 MAY 62	FK
B		CHANGED TO CONFORM WITH DETAILS - CHANGED DRAWER SIZES REVISED TITLES & ADDED REF DESIGNATIONS	D.O. 51804	30-JUL-63	
C		CHANGE IN ACCORDANCE WITH CN 197466 TARR 10220	—	11 MAY 64	

REVISIONS

NOTES:

Ⓒ 1. CONSOLE SHALL BE PROPERLY GROUNDED AT E1 & E80 BEFORE POWER CABLE IS CONNECTED.

2. WEIGHT & CENTER OF GRAVITY DATA: (INDICATED BY ⊕)

	WEIGHT		X	Y	Z
CABINET ONLY (IN CONDITION FOR SHIPMENT BUT WITHOUT SHIPPING CONTAINER) (APPROX)	1764 LBS		52	29 3/8	16
COMPLETE UNIT (AS SHOWN)					

3. HOISTING OF UNIT TO BE ACCOMPLISHED ONLY THRU USE OF LIFT TRUCK SLOTS PROVIDED IN BASE

4. UNLESS CONSOLE BASE IS FIRMLY ATTACHED TO A RIGID FLOOR, OVERTURN COULD RESULT WHEN 50% OF THE DRAWERS ARE EXTENDED.

5. RECOMMENDED MOUNTING HARDWARE - NOT FURNISHED WITH UNIT.

6. *INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.*

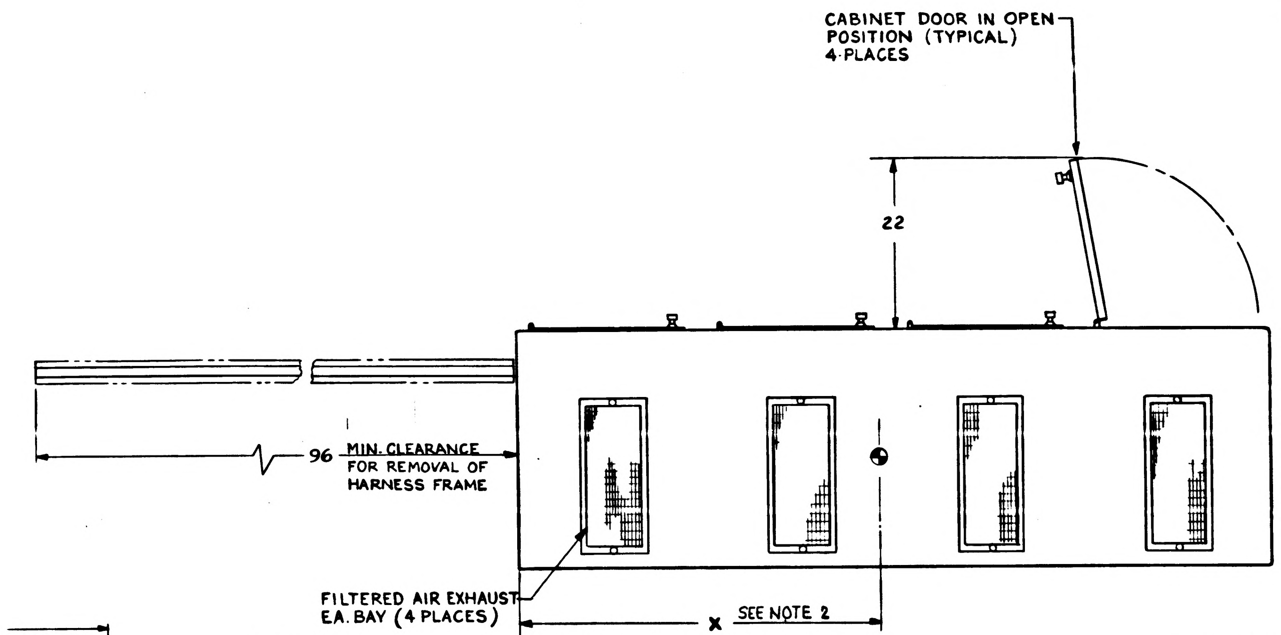
7. DIMENSIONS WITHOUT TOLERANCE - FOR REFERENCE ONLY.

8. OPERATIVE AMBIENT TEMPERATURE LIMIT 50°F TO 85°F (CONTINUOUS DUTY).

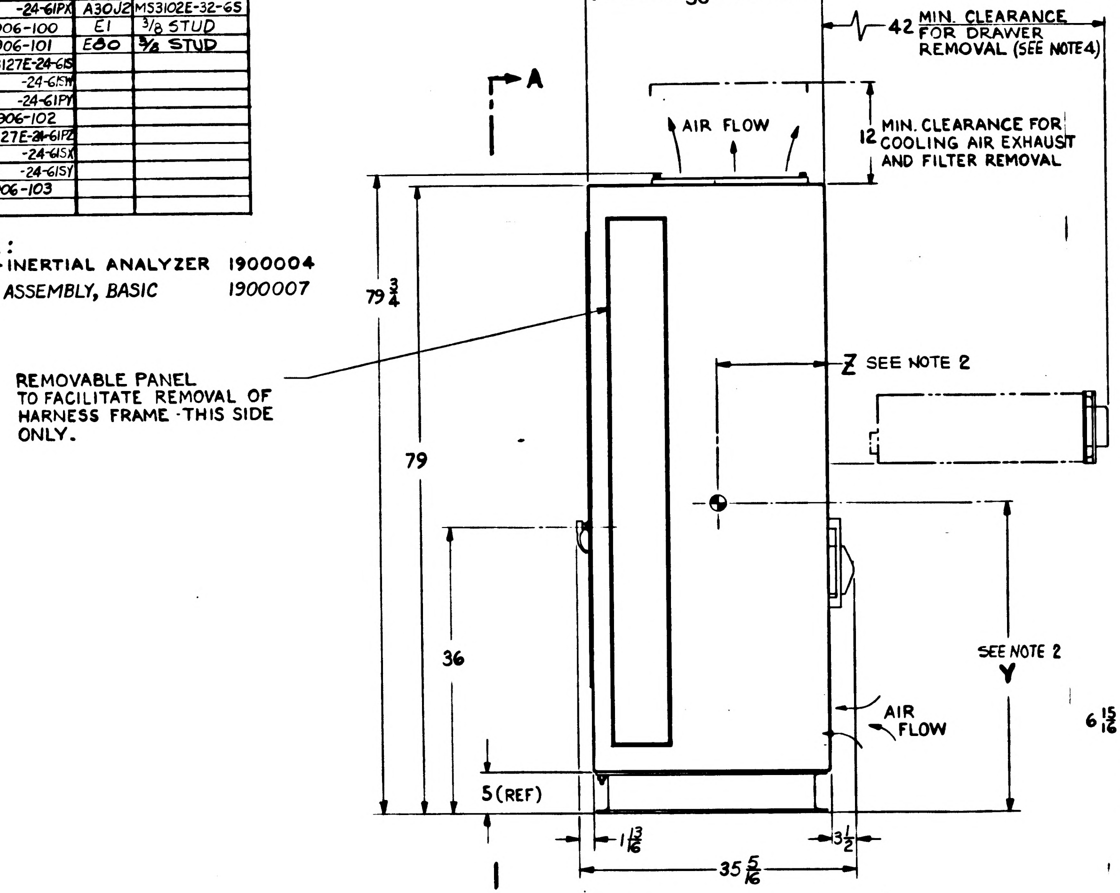
ELECTRICAL CONNECTOR DATA:

REF. DESIG.	PART NO	REF. DESIG.	PART NO.
J1	MS3127E-16-8S	J18	1015906-104
J2	-20-41S	J19	MS3127E-22-55P
J3	-22-55S	J20	-22-55PW
J4	-20-41SW	J21	-22-55PX
J5	-24-61P	J22	-22-55SW
J6	-24-61PW	A30J1	MS3102E-22-22P
J7	-24-61PX	A30J2	MS3102E-32-6S
J8	1015906-100	E1	3/8 STUD
J9	1015906-101	E80	3/8 STUD
J10	MS-3127E-24-61S		
J11	-24-61SW		
J12	-24-61PY		
J13	1015906-102		
J14	MS3127E-24-61PZ		
J15	-24-61SX		
J16	-24-61SY		
J17	1015906-103		

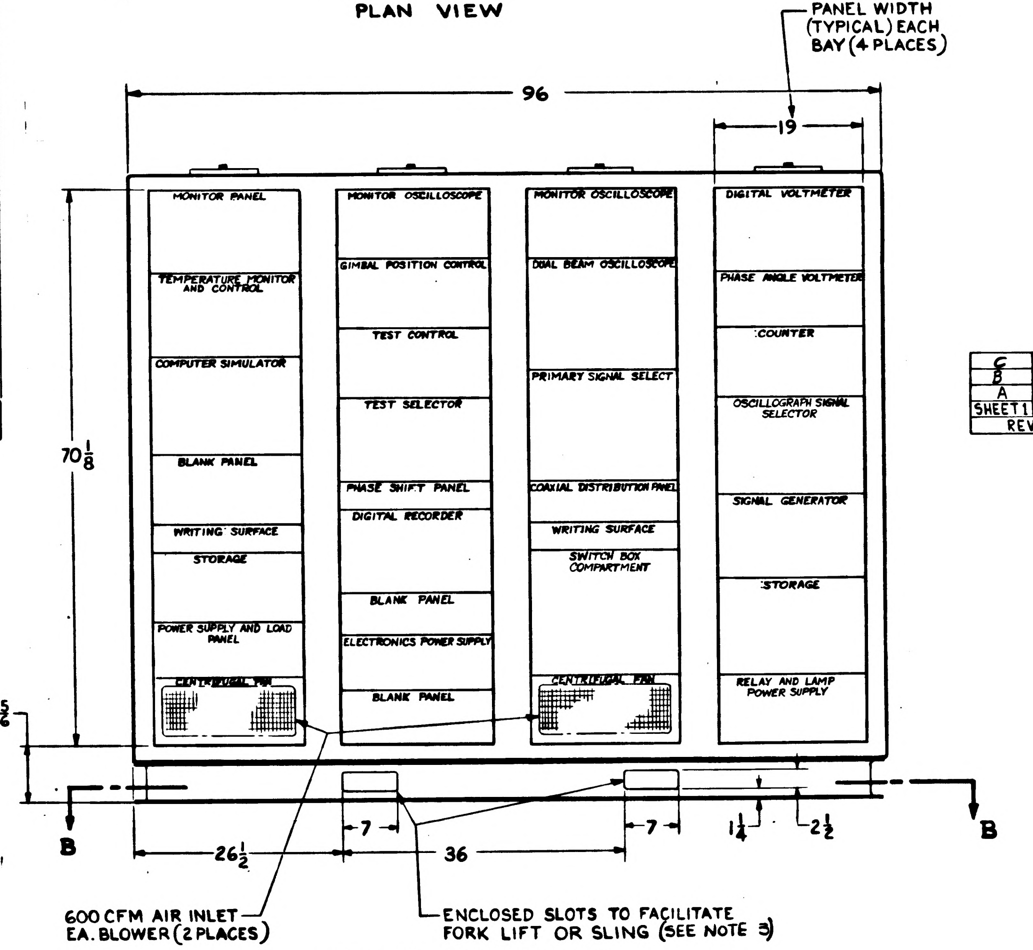
REFERENCE:
OPTICS-INERTIAL ANALYZER 1900004
CABINET ASSEMBLY, BASIC 1900007


CABINET DOOR IN OPEN POSITION (TYPICAL) 4 PLACES
22
96 MIN. CLEARANCE FOR REMOVAL OF HARNESS FRAME
FILTERED AIR EXHAUST EA. BAY (4 PLACES)
X SEE NOTE 2

PLAN VIEW


30
42 MIN. CLEARANCE FOR DRAWER REMOVAL (SEE NOTE 4)
A
AIR FLOW
12 MIN. CLEARANCE FOR COOLING AIR EXHAUST AND FILTER REMOVAL
79 3/4
79
REMOVABLE PANEL TO FACILITATE REMOVAL OF HARNESS FRAME - THIS SIDE ONLY.
Z SEE NOTE 2
36
SEE NOTE 2 Y
AIR FLOW
5 (REF)
1 13/16
3 1/2
35 5/16
A

LEFT SIDE ELEVATION

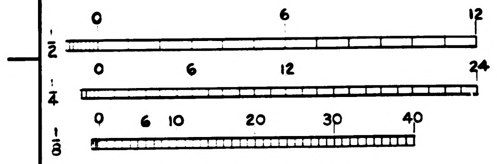

PANEL WIDTH (TYPICAL) EACH BAY (4 PLACES)
96
19
MONITOR PANEL
TEMPERATURE MONITOR AND CONTROL
COMPUTER SIMULATOR
BLANK PANEL
WRITING SURFACE
STORAGE
POWER SUPPLY AND LOAD PANEL
CENTRIFUGAL FAN
MONITOR OSCILLOSCOPE
GIMBAL POSITION CONTROL
TEST CONTROL
TEST SELECTOR
PHASE SHIFT PANEL
DIGITAL RECORDER
BLANK PANEL
ELECTRONICS POWER SUPPLY
BLANK PANEL
MONITOR OSCILLOSCOPE
DUAL BEAM OSCILLOSCOPE
PRIMARY SIGNAL SELECT
COAXIAL DISTRIBUTION PANEL
WRITING SURFACE
SWITCH BOX COMPARTMENT
CENTRIFUGAL FAN
DIGITAL VOLTMETER
PHASE ANGLE VOLTMETER
COUNTER
OSCILLOGRAPH SIGNAL SELECTOR
SIGNAL GENERATOR
STORAGE
RELAY AND LAMP POWER SUPPLY
70 1/8
6 15/16
B
B
26 1/2
7
36
7
1 1/4
2 1/2
600 CFM AIR INLET EA. BLOWER (2 PLACES)
ENCLOSED SLOTS TO FACILITATE FORK LIFT OR SLING (SEE NOTE 3)

FRONT (PANEL) ELEVATION

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02564 DATE 14 AUG. 63

C	C	
B	B	
A	—	
SHEET 1	SHEET 2	
REVISION STATUS OF SHEETS		


1/2
0
6
12
1/4
0
6
12
24
1/8
0
6
10
20
30
40

1900004	1900005
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiele DATE 21 MAR 63
CHECKED W. Diehl 12 APR 63
APPROVAL R. Blink 12 APR 63
APPROVAL L. Goldman 8/13/63
NASA APPROVAL F-1463 W. G. [illegible]
MIT APPROVAL [illegible] for 14 Aug 63

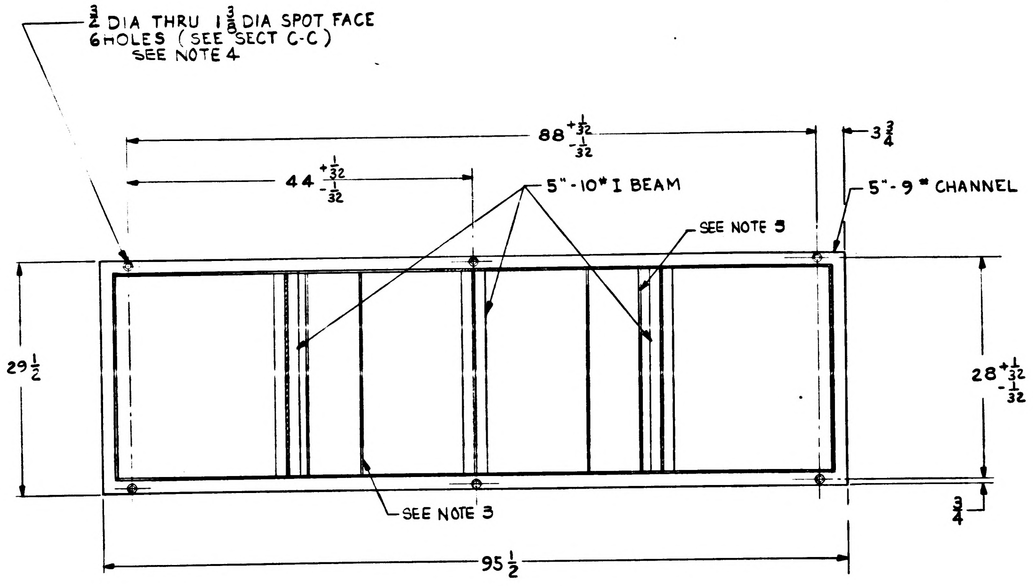
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OPTICS-INERTIAL ANALYZER
INSTALLATION DRAWING

CODE IDENT NO. SIZE E 1900016
SCALE 1/8 SHEET 1 OF 2

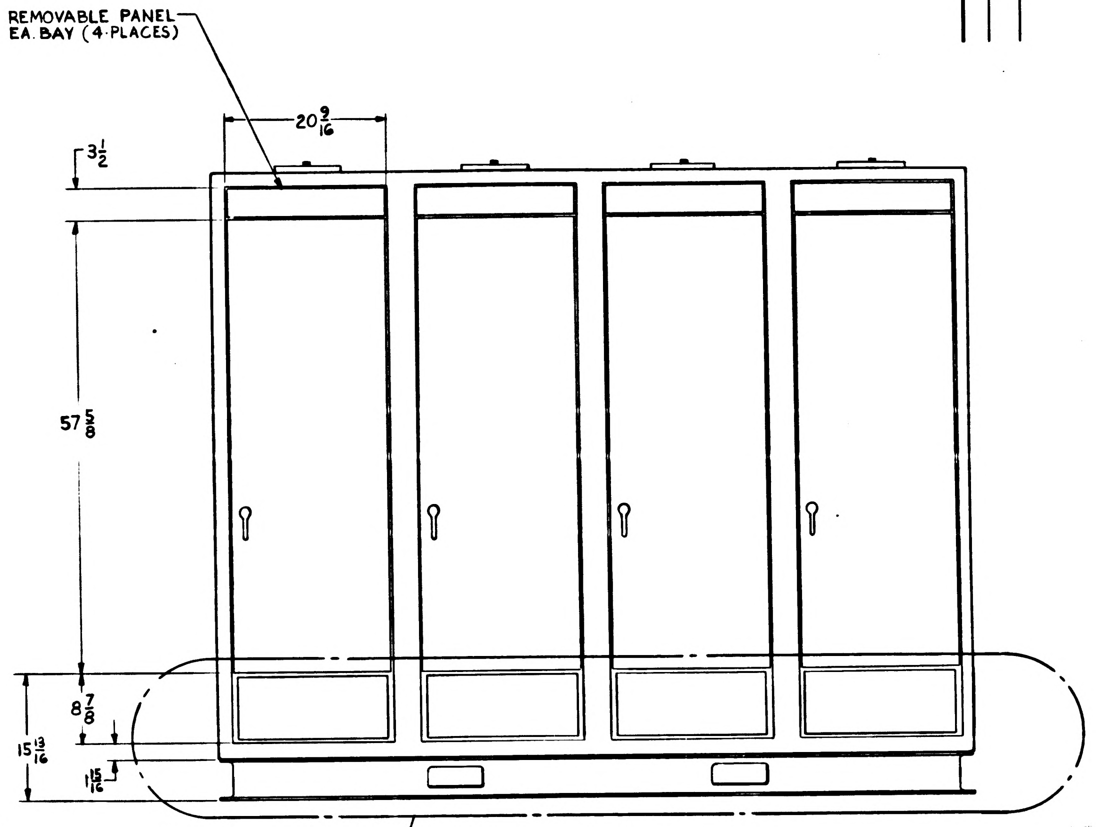
1900016 C

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B	C-1	(1) REVISED TO CONFORM WITH DETAILS (2) REMOVED PARTIAL SECTION D-D	QQ51804	30-JUL-63	
C		CHANGE IN ACCORDANCE WITH CM 197466 TDRR 10220	—	11 MAY 64	HC



3/2 DIA THRU 1 3/8 DIA SPOT FACE 6 HOLES (SEE SECT C-C) SEE NOTE 4
88 +1/32 -1/32
3 3/4
44 +1/32 -1/32
5"-10# I BEAM
5"-9# CHANNEL
SEE NOTE 5
29 1/2
28 +1/32 -1/32
SEE NOTE 3
3/4
95 1/2

SECTION B-B

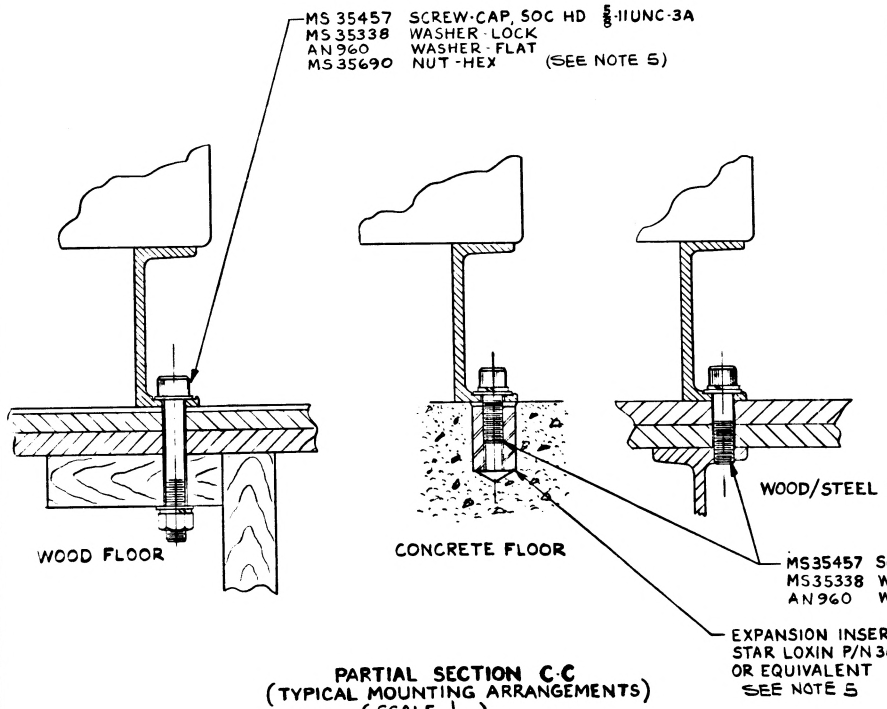


REMOVABLE PANEL EA. BAY (4 PLACES)
20 9/16
3 1/2
57 5/8
8 7/8
15 13/16
1 15/16

VIEW A-A
(REAR ELEVATION)

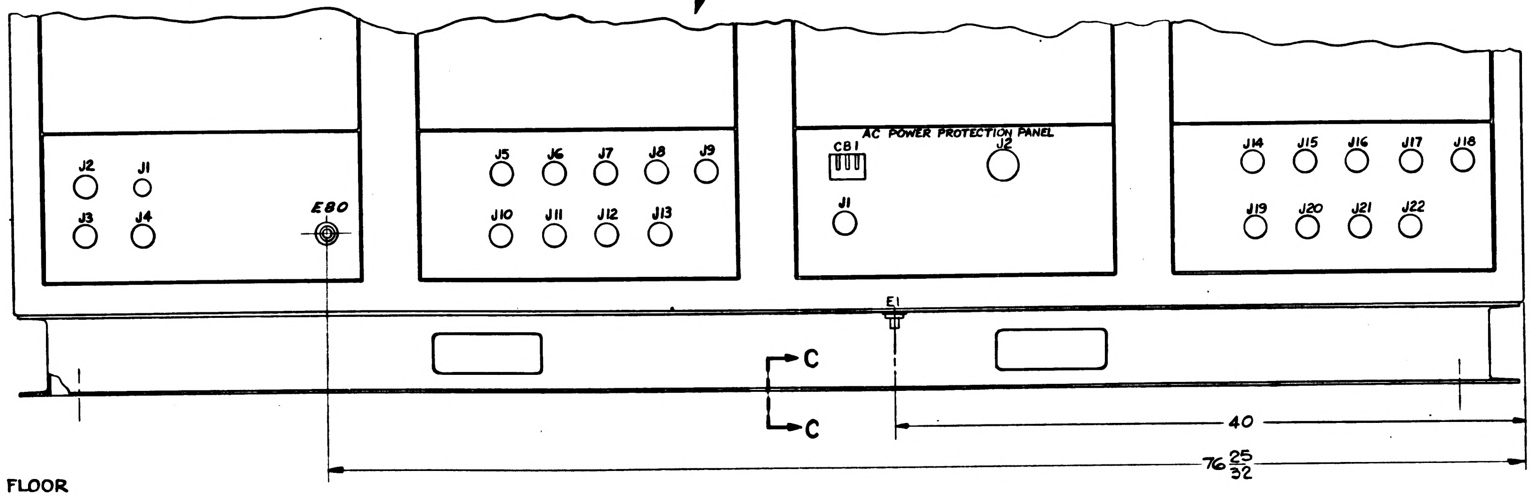
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02564 DATE 14 AUG 63



MS 35457 SCREW-CAP, SOC HD 5/8-11UNC-3A
MS 35338 WASHER-LOCK
AN960 WASHER-FLAT
MS 35690 NUT-HEX (SEE NOTE 5)
WOOD FLOOR
CONCRETE FLOOR
WOOD/STEEL FLOOR
MS35457 SCREW-CAP, SOC HD 5/8-11UNC-3A
MS35338 WASHER-LOCK
AN960 WASHER-FLAT
SEE NOTE 5
EXPANSION INSERT STAR LOXIN P/N 3645-3 OR EQUIVALENT SEE NOTE 5

PARTIAL SECTION C-C
(TYPICAL MOUNTING ARRANGEMENTS)
(SCALE 1/2)



J2
J1
J3
J4
E80
J5
J6
J7
J8
J9
J10
J11
J12
J13
AC POWER PROTECTION PANEL
CB1
J2
J1
J14
J15
J16
J17
J18
J19
J20
J21
J22
E1
C
C
40
76 25/32

INTERCONNECTION PANEL DETAIL
(REAR ELEVATION)
(SCALE 1/4)

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − DECIMALS + − ANGLES + −	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
APPLICATION		DO NOT SCALE THIS DRAWING	DRAWN W. Thiele DATE 12 APR 63 CHECKED W. Diehl 12 APR 63 APPROVAL R. Black 12 APR 63 APPROVAL L. G. Herman 8/7/63	OPTICS-INERTIAL ANALYZER INSTALLATION DRAWING	
		MATERIAL	NASA APPROVAL 8-14-63	CODE IDENT NO.	SIZE E 1900016
		CONTRACT NAS-9-497	MIT APPROVAL 14 Aug 63	SCALE 1/8	SHEET 2 OF 2

A 1900017

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A-2	WAS .250 DIA THRU .438 DIA C'BORE $\frac{3}{4}$ DEEP	186173	4/26/65	
	A-D-4	PICTORIAL CHANGES TO CONFORM			
	A-5	WAS $\frac{11}{16}$ DEEP + ASSEMBLY PER 33537			
	B-8	WAS MS 122239			

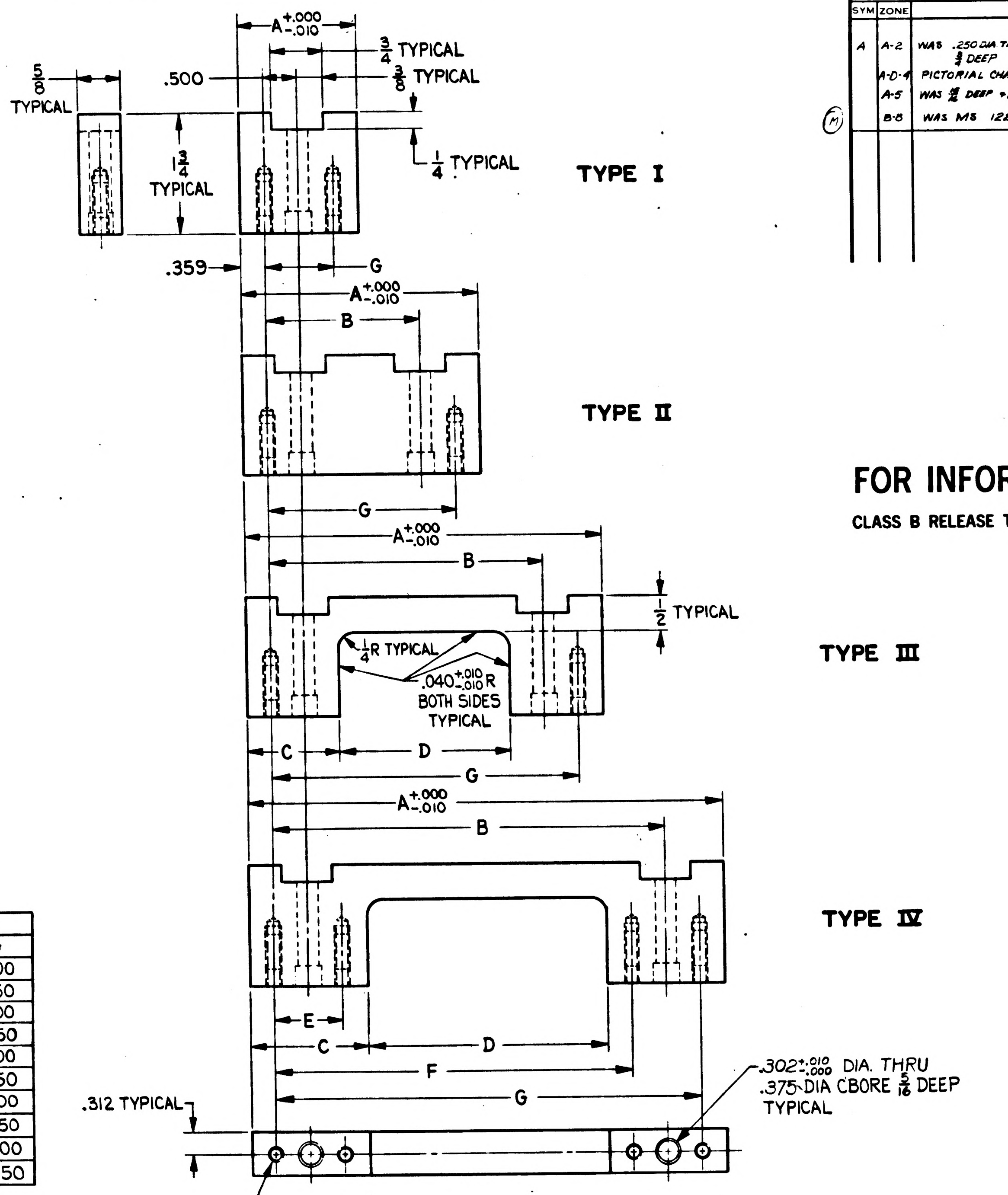
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1▷ MATERIAL:
AL ALY PER QQ-A-274 TEMPER T-5 (TYPE 6063 TYPE 2) (ES-2149)

FINISH:
CLEAR ANODIZE PER MIL-A-8625 TYPE II (ES-383)

UNLESS OTHERWISE SPECIFIED:
SURFACE ROUGHNESS MUST NOT EXCEED 125√
ALL EDGES MUST BE .005 TO .015 R OR CHAMFER

MUST BE FREE FROM BURRS AND SHARP CORNERS.



A $^{+.000}_{-.010}$
$\frac{3}{4}$ TYPICAL
$\frac{3}{8}$ TYPICAL
$\frac{5}{8}$ TYPICAL
.500
$1\frac{3}{4}$ TYPICAL
$\frac{1}{4}$ TYPICAL
TYPE I
.359
G
B
TYPE II
$\frac{1}{2}$ TYPICAL
$\frac{1}{4}$R TYPICAL
.040 $^{+.010}_{-.010}$ R BOTH SIDES TYPICAL
TYPE III
C
D
TYPE IV
E
F
.312 TYPICAL
.302 $^{+.010}_{-.000}$ DIA. THRU
.375 DIA CBORE $\frac{5}{16}$ DEEP
TYPICAL

2▷ .173 $^{+.003}_{-.002}$ DIA $\frac{7}{8}$ DEEP
120° CSK TO .220 $^{+.010}_{-.010}$ DIA.
ASSEMBLE PER MS 33646
TOP COIL 8P BELOW SURFACE,
REMOVE TANG AFTER INSERTION.
TYPICAL

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01118 DATE 5-1-63

DASH NO.	HANDLE TYPE	INSERT NO. 2▷	INSERTS REQ'D	DIMENSION A	B	C	D	E	F	G
-1	I	MS 21209 C0820	2	1.718	—	—	—	—	—	1.000
-2	II	↑	2	3.468	2.250	—	—	—	—	2.750
-3	III		2	5.219	4.000	$1\frac{23}{64}$	$2\frac{1}{2}$	—	—	4.500
-4	IV		4	6.968	5.750	$1\frac{47}{64}$	$3\frac{1}{2}$	1.000	5.250	6.250
-5	IV		4	8.718	7.500	$1\frac{47}{64}$	$5\frac{1}{4}$	1.000	7.000	8.000
-6	IV		4	10.468	9.250	$2\frac{39}{64}$	$5\frac{1}{4}$	1.875	7.875	9.750
-7	IV		4	12.219	11.000	$3\frac{31}{64}$	$5\frac{1}{4}$	2.750	8.750	11.500
-8	IV		4	13.968	12.750	$4\frac{23}{64}$	$5\frac{1}{4}$	3.625	9.625	13.250
-9	IV	↓	4	15.718	14.500	$5\frac{15}{64}$	$5\frac{1}{4}$	4.500	10.500	15.000
-10	IV	MS 21209 C0820	4	17.468	16.250	$6\frac{7}{64}$	$5\frac{1}{4}$	5.375	11.375	16.750

NEXT ASSY	USED ON
1900015	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+2°
$-\frac{1}{64}$	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL 1▷
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Tamassi DATE 4 APR 63
5 APR 63
CHECKED 8 APR 63
APPROVAL
APPROVAL 10 APR 63
NASA APPROVAL W J Rhine
J P Gilmore 4-30-63 5-1-63
MIT APPROVAL May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

HANDLE
(INSEPARABLE ASSY)

CODE IDENT NO.
SIZE D
1900017
SCALE 1:1
SHEET

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 MATERIAL:
AL ALY PER QQ-A-274 TEMPER T-5(TYPE 6063 TYPE 2)(ES-2149)

FINISH:
CLEAR ANODIZE PER MIL-A-8625 TYPE II (ES-383)

UNLESS OTHERWISE SPECIFIED:
SURFACE ROUGHNESS MUST NOT EXCEED 125√
ALL EDGES MUST BE .005 TO .015 R OR CHAMFER

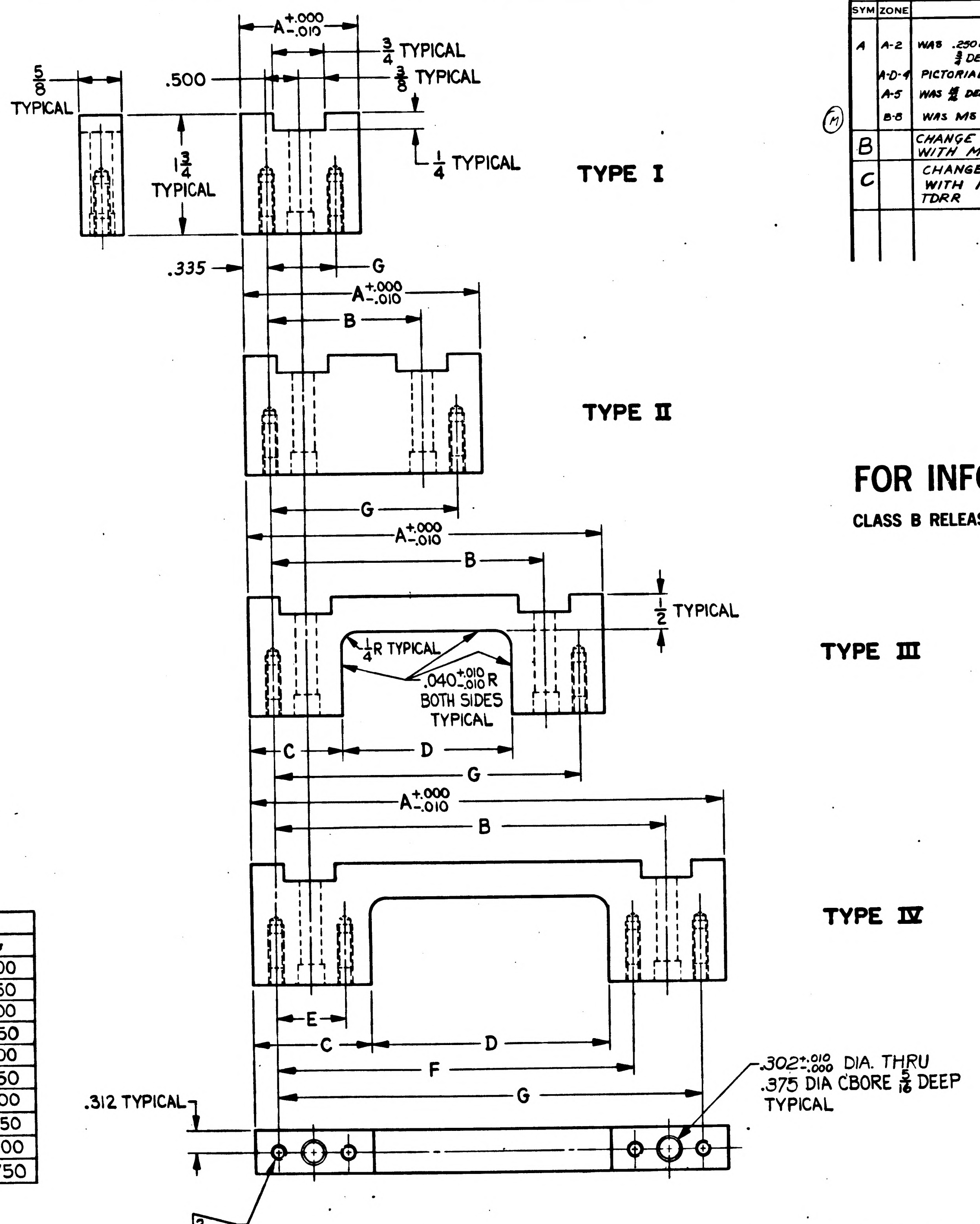
MUST BE FREE FROM BURRS AND SHARP CORNERS.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	A-2	WAS .250 DIA THRU .438 DIA C'BORE $\frac{3}{4}$ DEEP	186173	4/26/63	
	A-D-4	PICTORIAL CHANGES TO CONFORM			
	A-5	WAS $\frac{11}{16}$ DEEP + ASSEMBLY PER 39537			
	B-8	WAS MS 122239			
B		CHANGE IN ACCORDANCE WITH MXC 187001		11 JUN 63	
C		CHANGE IN ACCORDANCE WITH MXC 188067 PER TDRR 03717		12 JUL 63	CAM. J.E.G.

(M)

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01118 DATE 5-1-63



A $^{+.000}_{-.010}$
$\frac{3}{4}$ TYPICAL
$\frac{3}{8}$ TYPICAL
$\frac{5}{8}$ TYPICAL
.500
$1\frac{3}{4}$ TYPICAL
$\frac{1}{4}$ TYPICAL
TYPE I
.335
G
B
TYPE II
$\frac{1}{2}$ TYPICAL
$\frac{1}{4}$R TYPICAL
.040 $^{+.010}_{-.010}$ R BOTH SIDES TYPICAL
C
D
TYPE III
TYPE IV
E
F
.312 TYPICAL
.302 $^{+.010}_{-.000}$ DIA. THRU .375 DIA CBORE $\frac{5}{16}$ DEEP TYPICAL

2 .173 $^{+.003}_{-.002}$ DIA $\frac{3}{8}$ DEEP
120°CSK TO .220 $^{+.010}_{-.010}$ DIA.
ASSEMBLE PER MS 33646
TOP COIL 8P BELOW SURFACE,
REMOVE TANG AFTER INSERTION.
TYPICAL

DASH NO.	HANDLE TYPE	INSERT NO. 2	INSERTS REQ'D	DIMENSION A	B	C $^{+.015}_{-.015}$	D	E	F	G
-1	I	MS 21209 C0820	2	1.670	—	—	—	—	—	1.000
-2	II	↑	2	3.420	2.250	—	—	—	—	2.750
-3	III		2	5.171	4.000	1.335	$2\frac{1}{2}$	—	—	4.500
-4	IV		4	6.920	5.750	1.710	$3\frac{1}{2}$	1.000	5.250	6.250
-5	IV		4	8.670	7.500	1.710	$5\frac{1}{4}$	1.000	7.000	8.000
-6	IV		4	10.420	9.250	2.585	$5\frac{1}{4}$	1.875	7.875	9.750
-7	IV		4	12.171	11.000	3.460	$5\frac{1}{4}$	2.750	8.750	11.500
-8	IV		4	13.920	12.750	4.335	$5\frac{1}{4}$	3.625	9.625	13.250
-9	IV	↓	4	15.670	14.500	5.210	$5\frac{1}{4}$	4.500	10.500	15.000
-10	IV	MS 21209 C0820	4	17.420	16.250	6.085	$5\frac{1}{4}$	5.375	11.375	16.750

1900015	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+2°
$-\frac{1}{64}$	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL 1
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Tamasi DATE 4 APR 63
Mak Rausher 5 APR 63
CHECKED 8 APR 63
APPROVAL
APPROVAL 10 Apr 63
NASA APPROVAL W J Rhine 5-1-63
J P Gilmore 4-30-63
MIT APPROVAL W. Guffer 1 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

HANDLE
(INSEPARABLE ASSY)

CODE IDENT NO. SIZE D 1900017
SCALE 1:1 SHEET

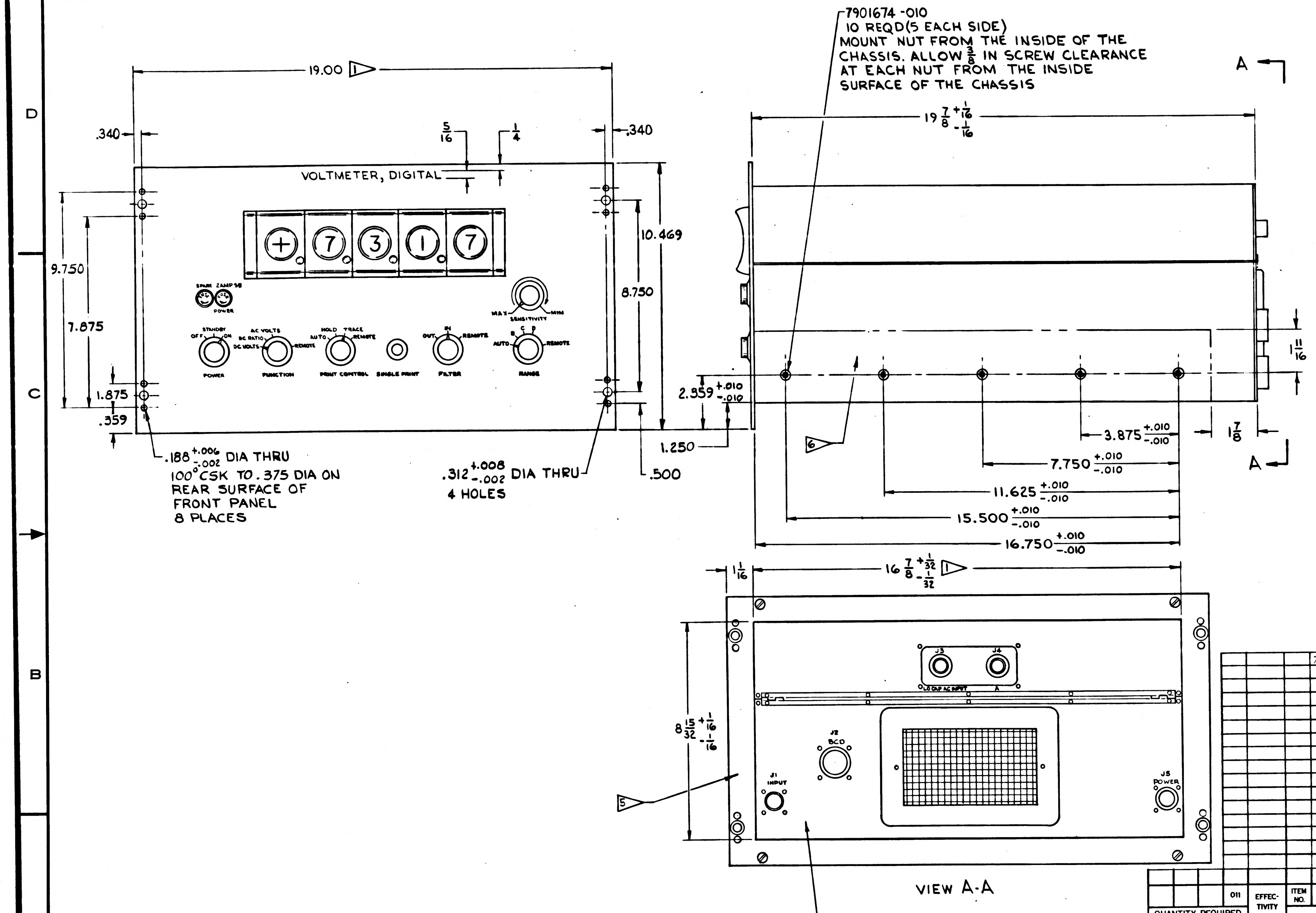
MIL 1077D-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

F 8100061 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		COMPLETELY REVISED AND REDRAWN	DO.51250	22 DEC 62	RWH
D		REVISED	DO.51349	1 MAR 63	RWH
E		REVISED	DO.51375	8 MAR '63	
F	-	REVISED. ADDED NASA DRAWING NUMBER	D.O. 51407	29-MAR-63	

7901674 -010
10 REQD (5 EACH SIDE)
MOUNT NUT FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{3}{8}$ IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS


19.00 ▷1
.340
.340
$\frac{5}{16}$
$\frac{1}{4}$
VOLTMETER, DIGITAL
+ 7 3 0 7
SPARK ZAMP 58
POWER
MAX SENSITIVITY MIN
STANDBY OFF ON
POWER
AC VOLTS DC RATIO DC VOLTS REMOTE
FUNCTION
HOLD TRACE AUTO REMOTE
PRINT CONTROL
SINGLE PRINT
OUT IN REMOTE
FILTER
AUTO REMOTE
RANGE
9.750
7.875
1.875
.359
10.469
8.750
1.250
.500
$2.359^{+.010}_{-.010}$
$19\frac{7}{8}{}^{+\frac{1}{16}}_{-\frac{1}{16}}$
$1\frac{11}{16}$
$1\frac{7}{8}$
$3.875^{+.010}_{-.010}$
$7.750^{+.010}_{-.010}$
$11.625^{+.010}_{-.010}$
$15.500^{+.010}_{-.010}$
$16.750^{+.010}_{-.010}$
6
A
A
$1\frac{1}{16}$
$16\frac{7}{8}{}^{+\frac{1}{32}}_{-\frac{1}{32}}$ ▷1
$8\frac{15}{32}{}^{+\frac{1}{16}}_{-\frac{1}{16}}$
J3
J4
J2 BCD
J1 INPUT
J5 POWER
5
4

$.188^{+.006}_{-.002}$ DIA THRU
100° CSK TO .375 DIA ON
REAR SURFACE OF
FRONT PANEL
8 PLACES

$.312^{+.008}_{-.002}$ DIA THRU
4 HOLES

VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00649 **DATE** 24 Apr 63

						TO BE ASSIGNED	VOLTMETER (EITRONIC 850)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900042		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS $\pm\frac{1}{64}$ DECIMALS $\pm$ ▷2 ANGLES $\pm 2°$
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44294
DRAWN L. SOMMER DATE 2 NOV 62
CHECKED W. Diehl 2 APR 63
APPROVAL 2 APR 63
APPROVAL 2 APR 63
NASA APPROVAL 4/24/63
J P Heimore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

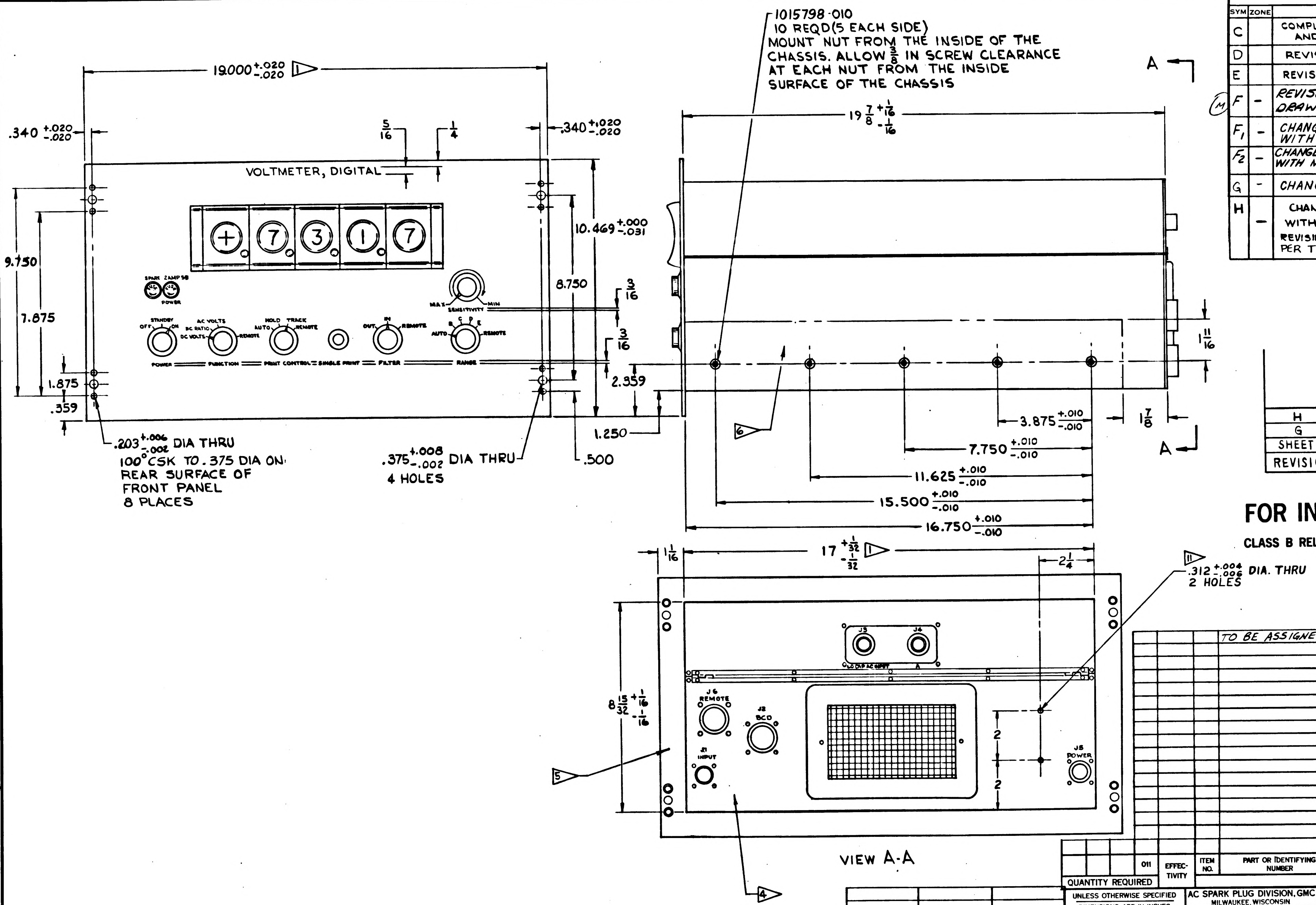
VOLTMETER, DIGITAL

CODE IDENT NO.
SIZE D
1900018
SCALE —
SHEET 1 OF 3

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H | 8100061 | 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		COMPLETELY REVISED AND REDRAWN	DO.51250	28 DEC 62	RWH
D		REVISED	DO.51349	1 MAR 63	RWH
E		REVISED	DO.51375	18 MAR '63	CJL.
F	-	REVISED. ADDED NASA DRAWING NUMBER	D.O. 51407	29-MAR-63	A.J.F. W.D.
F1	-	CHANGE IN ACCORDANCE WITH MXC-186087	-	1-MAY-63	J.B. P.F.
F2	-	CHANGE IN ACCORDANCE WITH MXC 186760	—	23-MAY-63	JEL
G	-	CHANGE PER MXC187306	—	19 JUNE 63	A.N.
H	—	CHANGE IN ACCORDANCE WITH MXC-188668 REVISION STATUS CHANGED PER TDRR 03864	—	8 AUG 63	JRK


1015798-010
10 REQD (5 EACH SIDE)
MOUNT NUT FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS
19.000 +.020 -.020
1
.340 +.020 -.020
.340 +.020 -.020
5/16
1/4
VOLTMETER, DIGITAL
+ 7 3 1 7
SPARE 2AMP SB
POWER
MAX
SENSITIVITY
MIN
STANDBY
OFF
ON
AC VOLTS
DC RATIO
DC VOLTS
REMOTE
HOLD
TRACK
AUTO
REMOTE
OUT
IN
REMOTE
B C D E
AUTO
REMOTE
POWER
FUNCTION
PRINT CONTROL
SINGLE PRINT
FILTER
RANGE
9.750
7.875
1.875
.359
10.469 +.000 -.031
8.750
3/16
3/16
2.359
1.250
.500
.203 +.006 -.002 DIA THRU
100° CSK TO .375 DIA ON REAR SURFACE OF FRONT PANEL
8 PLACES
.375 +.008 -.002 DIA THRU
4 HOLES
19 7/8 +1/16 -1/16
A
A
6
1 11/16
1 7/8
3.875 +.010 -.010
7.750 +.010 -.010
11.625 +.010 -.010
15.500 +.010 -.010
16.750 +.010 -.010
1 1/16
17 +1/32 -1/32
1
2 1/4
11
.312 +.004 -.006 DIA. THRU
2 HOLES
8 15/32 +1/16 -1/16
J3
J4
LO CAP AC INPUT
A
J6 REMOTE
J2 BCD
J1 INPUT
J5 POWER
2
2
5
4
VIEW A-A

H	H	H
G	G	G
SHEET 1	SHEET 2	SHEET 3

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	VOLTMETER (EITRONIC 850)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900042		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44294
DRAWN L. SOMMER DATE 2 NOV 62
CHECKED W. Diehl 2 APR. 63
APPROVAL M.G. Hansen 2 APR 63
APPROVAL A. Friedel 2 APR 63
NASA APPROVAL 4-24-63
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL

CODE IDENT NO. | SIZE D | 1900018
SCALE — | SHEET 1 OF 3

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
G		CHANGE PER MXC 187306	—	19 JUNE 63	A.N.
H		CHANGE IN ACCORDANCE WITH MXC-188668 PER TDRR 03264	—	8 AUG 63 15 Oct 63	JPK WK

REQUIREMENTS:
ELECTRICAL SPECIFICATIONS:
VISUAL DISPLAY: 4 DECIMAL DIGITS, POLARITY SIGN OR MODE INDICATION.
DC VOLTAGE RANGE: ±.0001 TO ±999.9 VOLTS.
DC VOLTAGE ACCURACY: MAXIMUM ERROR ±0.05% OF READING ±1 DIGIT
DC BALANCE TIME: 200 MILLISECONDS MAX.
DC INPUT IMPEDANCE: 1000 MEGOHMS FROM ±.0001 TO ±9.999 VOLTS, 10 MEGOHMS FROM ±10.00 TO ±999.9 VOLTS.
AC VOLTAGE RANGE: .0001 TO 999.9 VOLTS.
AC VOLTAGE ACCURACY: MAXIMUM ERROR ±0.1% OF READING ±1 DIGIT 60 CPS TO 10KC; ±0.2% OF READING ±1 DIGIT AT 25.6 KC.
AC BALANCE TIME: 8 SECONDS MAX.
AC INPUT IMPEDANCE AT LO CAP. AC INPUT:
1 MEGOHM SHUNTED BY 45μμfd FROM .0001 TO 9.999 VOLTS, 10 MEGOHMS SHUNTED BY 45μμfd FROM 10.00 TO 999.9 VOLTS.
AC FREQUENCY RESPONSE: SEE AC VOLTAGE ACCURACY.
AUTOMATIC FEATURES: DECIMAL POINT PLACEMENT; POLARITY FOR DC INPUTS; AC SYMBOL INDICATION FOR AC INPUTS.
POWER INPUT: 105-125 VOLTS, 60 ±5 CPS, SINGLE PHASE 110 WATTS.
INPUT: SIGNAL CIRCUITY LO & POWER LO SHALL BE ISOLATED FROM EACH OTHER, FROM THE CHASSIS, AND FROM THE FRAME FOR BOTH AC AND DC.
OUTPUT: THE OUTPUT SHALL BE IN THE 4 LINE $\bar{2}$421 BCD CODE OR 8421 BCD CODE, UNLESS OTHERWISE SPECIFIED AND SHALL PROVIDE VOLTAGE MAGNITUDE INFORMATION, DECIMAL POINT PLACEMENT INFORMATION, FUNCTION INFORMATION (+, −, AC) AND ALL CONTROL SIGNALS NECESSARY FOR OPERATION WITH 1900063 PRINTER. LOGIC "1" = 0^V TO $+50^V$; LOGIC "0" = -12^V TO -50^V. LISTED IN THE FOLLOWING TABLES ARE THE BINARY REPRESENTATIONS OF THE OUTPUT INFORMATION IN THE $\bar{2}$421 BCD AND 8421 BCD CODES.

	$\bar{2}$	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	1	1	0
9	1	1	1	1

	8	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

TEST SIGNAL INPUT: ALL DC AND AC 60 CPS TO 25.6 KC INPUT SIGNALS SHALL BE APPLIED TO INPUT RECEPTACLE J1 TO OBTAIN THE RATED ACCURACY. J3 INNER AND OUTER CONDUCTORS SHALL BE INTERNALLY SHORTED TO J4 INNER AND OUTER CONDUCTORS RESPECTIVELY.

REQUIREMENTS (CONTINUED):
MECHANICAL SPECIFICATIONS:
FRONT PANEL MATERIAL:
$\frac{3}{16}$ THICK ALUMINUM ALLOY QQ-A-318, TEMPER H-32.

1▷ 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. SIDES OF CHASSIS LOCATED BY 17 DIM. MUST BE PARALLEL WITHIN .031 AND PERPINDICULAR TO THE REAR SURFACE OF FRONT PANEL WITHIN .062

FRONT PANEL FINISH - APPLY FINISH P513 OF SPEC MIL-F-14072. PRIME & FINISH COATS TO BE APPLIED TO PANEL FRONT & EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595.

CHARACTERS PER ND-1002122
CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157.
CENTRALIZE AS SHOWN.

TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

ALL KNOBS SHALL BE PER MS91528 TYPE F AND K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND-1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP-1900018

4▷ EXACT CONNECTOR LOCATION ON REAR OF ASSY IS TO BE DETERMINED BY SUPPLIER.

WEIGHT 60 LBS APPROXIMATELY.

DATA SOURCE
ELECTRO INSTRUMENTS, INC., SAN DIEGO, CALIF.
MODEL NO. EITRONIC 850, 4 DIGIT MULTIMETER.
BULLETIN NO. D8.18.

INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

5▷ BORDER AREA, WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR AND FREE OF PROTUSIONS.

6▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATION HOLES WILL BE EFFECTIVE IN THIS AREA.

7▷

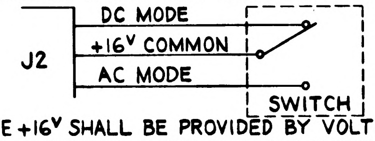
DECIMAL 4	3	2	1	DECIMAL POINT
0	0	0	1	XXX.X
0	0	1	0	XX.XX
0	1	0	0	X.XXX
1	0	0	0	.XXXX

8▷

BCD 4	2	1	SYMBOL
0	0	0	+
0	0	1	−
0	1	0	F
1	0	1	AC
1	0	0	R

THE REQUIREMENT FOR AN F SYMBOL EXISTS ONLY IF THE VOLTMETER HAS THE CAPABILITY TO CAUSE AN ERRONEOUS READING TO BE PRINTED. THE F SYMBOL WILL INDICATE THAT THE READING IS ERRONEOUS. THE R SYMBOL SHALL INDICATE DC/DC RATIO MODE.

9▷ PRINT COMMAND TO PRINTER IS A CHANGE FROM BINARY "1" TO "0". THE BINARY "0" MUST BE 100 MSEC MINIMUM; BINARY "1" MUST BE 15 MSEC MINIMUM BEFORE NEXT PRINT COMMAND. SOURCE RESISTANCE 1 MEGOHM MAX. PRINT COMPLETE FROM PRINTER OCCURS NO MORE THAN 50 MSEC AFTER PRINT COMMAND; PRINT COMMAND 200 MSEC MAXIMUM DURATION. PRINT COMPLETE COMMAND A CLOSURE THROUGH A 220 OHM RESISTOR TO PRINTER LOGIC GROUND.

10▷


THE $+16^V$ SHALL BE PROVIDED BY VOLTMETER. EXTERNAL SWITCHING SHALL CAUSE VOLTMETER TO OPERATE IN EITHER THE AC MODE OR THE DC MODE.

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±— DECIMALS ±— ANGLES ±—
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44294
DRAWN L. SOMMER DATE 2 NOV 62
CHECKED W. DIEHL 2 APR '63
APPROVAL M. S. Hanes 2 APR '63
APPROVAL A. Kodel 2 APR 63
NASA APPROVAL
J. Gilmore 4-24-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL

CODE IDENT NO.
SIZE D
1900018
SCALE —
SHEET 2 OF 3

H 8100061

CONNECTOR IDENTIFICATION	CONNECTOR FUNCTION	PIN IDENTIFICATION	PIN USE	NOTES
MS3112E-10-6P J1	INPUT	A	CHASSIS GROUND	
		B	SIGNAL INPUT HI	
		C	SIGNAL INPUT LO	
		D	REF INPUT HI	
		E, F	SPARE	
MS3112E-20-41S J2	BCD	B C D F	1 2 4 8 } BCD	UNITS INDICATORS
		H J K L	1 2 4 8 } BCD	TENS INDICATORS
		M P S V	1 2 4 8 } BCD	HUNDREDS INDICATORS
		W X Z a	1 2 4 8 } BCD	THOUSANDS INDICATORS
		f	1 } BCD	SYMBOL INDICATION 8
		g	2	
		k̄	4	
		j	PRINT COMMAND	TO PRINTER 9
		m	PRINT COMPLETE	FROM PRINTER
		n	LOGIC GROUND	
		R	RATIO MODE	
		A, E, G, N, d, h, i, p̄, q, r, s, t	SPARES	
		T	+16^{V} COMMON	FUNCTION SWITCH REMOTE 10
		U	DC MODE	
		Y	AC MODE	
	DECIMAL	b	1 } DECIMAL	DECIMAL POINT INDICATION 7
		c̄	2	
		d	3	
		e	4	

11 ALLOW ½ INCH CLEARANCE BEHIND EACH HOLE.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
G		CHANGE PER MXC 187306	-	19 JUNE 63	A.N.
H		CHANGE IN ACCORDANCE WITH MXC 188668 PER TDRR 03864	—	8 AUG 63 1 OCT 63	JRK WK

CONNECTOR IDENTIFICATION	CONNECTOR FUNCTION	PIN IDENTIFICATION	PIN USE	NOTES
UG-1094/U J3		INNER CONDUCTOR	SIGNAL HI	
		OUTER CONDUCTOR	SHIELD OR LO	
UG-1094/U J4	LO CAP AC INPUT	INNER CONDUCTOR	SIGNAL HI	
		OUTER CONDUCTOR	SHIELD OR LO	
MS3112E16-8P J5	POWER	A	CHASSIS	
		B	SPARE	
		C	SPARE	
		D	INPUT POWER HI	
		E	INPUT POWER LO	
		F, G, H	SPARES	
MS3112E14-19S J6	REMOTE CONTROL	B	PRINT CONTROL, REMOTE	PRINT SWITCH REMOTE
		C	HOLD	
		D	TRACK	
		E	SINGLE PRINT, REMOTE	SINGLE PRINT OR/AND FILTER REMOTE
		F	POWER GROUND	
		G	FILTER, REMOTE	
		H	RANGE, REMOTE	RANGE SWITCH REMOTE
		J	AUTO	
		K	B RANGE	
		L	C RANGE	
		M	D RANGE	
		N	E RANGE	
		A, P, R, S, T, U, V	SPARES	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 APR 63

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	ACSP PN SK 44294	
	DRAWN L. SOMMER DATE 2 NOV 62	VOLTMETER, DIGITAL
	CHECKED W DIEHL 2 APR 63	
	APPROVAL M H Hauser 2-APR-63	
DO NOT SCALE THIS DRAWING	APPROVAL 2 APR 63	
MATERIAL	NASA APPROVAL 4/24/63 4-24-63	CODE IDENT NO. — SIZE D — 1900018
CONTRACT NAS9-497	MIT APPROVAL 24 Apr 63	SCALE — — SHEET 3 OF 3

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD

REQUIREMENTS:
ELECTRICAL SPECIFICATIONS:
VISUAL DISPLAY: 4 DECIMAL DIGITS, POLARITY SIGN OR MODE INDICATION.
DC VOLTAGE RANGE: ±.0001 TO ±999.9 VOLTS.
DC VOLTAGE ACCURACY: ±0.05% OF READING ±1 DIGIT.
DC BALANCE TIME: 200 MILLISECONDS MAX.
DC INPUT IMPEDANCE: 1000 MEGOHMS FROM ±.0001 TO ±9.999 VOLTS, 10 MEGOHMS FROM ±10.00 TO ±999.9 VOLTS.
AC VOLTAGE RANGE: .0001 TO 999.9 VOLTS.
AC VOLTAGE ACCURACY: ±0.1% OF READING ±1 DIGIT 60 CPS TO 10KC; ±0.2% OF READING ±1 DIGIT AT 25.6 KC.
AC BALANCE TIME: 8 SECONDS MAX.
AC INPUT IMPEDANCE AT LO CAP. AC INPUT: 1 MEGOHM SHUNTED BY 45μμfd FROM .0001 TO 9.999 VOLTS, 10 MEGOHMS SHUNTED BY 45μμfd FROM 10.00 TO 999.9 VOLTS.
AC FREQUENCY RESPONSE: SEE AC VOLTAGE ACCURACY.
AUTOMATIC FEATURES: DECIMAL POINT PLACEMENT; POLARITY FOR DC INPUTS; AC SYMBOL INDICATION FOR AC INPUTS.
POWER INPUT: 105-125 VOLTS, 60 CPS, SINGLE PHASE, 110 WATTS.
INPUT: SIGNAL CIRCUITY LO & POWER LO SHALL BE ISOLATED FROM EACH OTHER, FROM THE CHASSIS, AND FROM THE FRAME FOR BOTH AC AND DC.
OUTPUT: THE OUTPUT OF THE DVM SHALL BE IN THE 4 LINE $\bar{2}$421 BCD CODE OR 8421 BCD CODE. THE DVM SHALL PROVIDE VOLTAGE MAGNITUDE INFORMATION, DECIMAL POINT PLACEMENT INFORMATION, FUNCTION INFORMATION (+, −, AC) AND ALL CONTROL SIGNALS NECESSARY FOR OPERATION WITH AC SPARK PLUG P/N SK-44269 PRINTER. LOGIC "1" = 0^V TO $+50^V$; LOGIC "0" = -12^V TO -50^V. LISTED IN THE FOLLOWING TABLES ARE THE BINARY REPRESENTATIONS OF THE OUTPUT INFORMATION IN THE $\bar{2}$421 BCD AND 8421 BCD CODES.

	$\bar{2}$	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	1	1	0
9	1	1	1	1

	8	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

TEST SIGNAL INPUT: THE 25.6 KC (AC INPUT SIGNALS) MUST BE APPLIED TO THE LO CAP. AC INPUT RECEPTACLE (UG1094/U) TO OBTAIN THE RATED ACCURACY.
THE 60 CPS INPUT SIGNALS AND THE 400 CPS TO 10KC INPUT SIGNALS MAY BE APPLIED TO EITHER THE LO CAP. AC INPUT RECEPTACLE (UG1094/U)J3 OR THE 4 PIN INPUT RECEPTACLE J1 TO OBTAIN THE RATED ACCURACY. ALL DC INPUT SIGNALS SHALL BE APPLIED TO THE 4 PIN INPUT RECEPTACLE J1. WHENEVER AN INPUT SIGNAL (AC OR DC) IS APPLIED TO THE 4 PIN INPUT RECEPTACLE, THE LO CAP AC INPUT RECEPTACLE (UG1094/U) J3 INNER SHALL BE EXTERNALLY SHORTED TO THE "A" RECEPTACLE (UG1094/U) J4 INNER. THE EXTERNAL SHORT WILL BE REMOVED WHEN APPLYING AN INPUT SIGNAL TO LO CAP AC INPUT J3.

REQUIREMENTS (CONTINUED):
MECHANICAL SPECIFICATIONS:
FRONT PANEL MATERIAL:
$\frac{3}{16}$ THICK ALUMINUM ALLOY 5052-H32.

1▷ 19 AND 16$\frac{7}{8}$ INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED AT ASSEMBLY.

2▷ DECIMAL TOLERANCES AS FOLLOWS:
.000 ±.005

FRONT PANEL FINISH-APPLY FINISH P513 OF SPEC MIL-F-14072. PRIME & FINISH COATS TO BE APPLIED TO PANEL FRONT & EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595.
REAR FACE OF FRONT PANEL TO BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

CHARACTERS (FUTURA-DEMIBOLD).
CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157.
CENTRALIZE AS SHOWN.

TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

ALL KNOBS SHALL BE PER MS91528 TYPE F AND K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN (ES-)ND

4▷ EXACT CONNECTOR LOCATION ON REAR OF ASSY IS TO BE DETERMINED BY SUPPLIER.

EQUIPMENT SHALL BE DESIGNED TO MEET ENVIRONMENTAL REQUIREMENTS PER

DATA SOURCE
ELECTRO INSTRUMENTS, INC., SAN DIEGO, CALIF.
MODEL NO. EITRONIC 850, 4 DIGIT MULTIMETER.
BULLETIN NO. D8.18.

5▷ BORDER AREA WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR AND FREE OF PROTUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

6▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATION HOLES WILL BE EFFECTIVE IN THIS AREA.

7▷

BCD 4	2	1	DECIMAL POINT
0	0	1	XXX.X
0	1	0	XX.XX
0	1	1	X.XXX
1	0	0	.XXXX

8▷

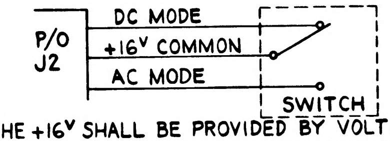
BCD 4	2	1	SYMBOL
0	0	0	+
0	0	1	−
0	1	0	F
1	0	1	AC

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

THE REQUIREMENT FOR AN F SYMBOL EXISTS ONLY IF THE VOLTMETER HAS THE CAPABILITY TO CAUSE AN ERRONEOUS READING TO BE PRINTED. THE F SYMBOL WILL INDICATE THAT THE READING IS ERRONEOUS.

9▷ PRINT COMMAND TO PRINTER IS A CHANGE FROM BINARY "1" TO "0". THE BINARY "0" MUST BE 100 MSEC MINIMUM; BINARY "1" MUST BE 15 MSEC MINIMUM BEFORE NEXT PRINT COMMAND. SOURCE RESISTANCE 1 MEGOHM MAX. PRINT COMPLETE FROM PRINTER OCCURS NO MORE THAN 50 MSEC AFTER PRINT COMMAND; IS OF 200 MSEC MAXIMUM DURATION.

10▷



THE $+16^V$ SHALL BE PROVIDED BY VOLTMETER. EXTERNAL SWITCHING SHALL CAUSE VOLTMETER TO OPERATE IN EITHER THE AC MODE OR THE DC MODE.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN SK-44294	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	DRAWN L. SOMMER DATE 2 NOV 62 CHECKED W. DIEHL 2 APR '63 APPROVAL M. [illegible] 2 APR '63 APPROVAL A. Model 2 APR 63	VOLTMETER, DIGITAL	
DO NOT SCALE THIS DRAWING			
MATERIAL	NASA APPROVAL [illegible] 4-24-63 [illegible] 4-2-63	CODE IDENT NO.	SIZE D 1900018
CONTRACT NAS9-497	MIT APPROVAL [illegible] 24 Apr 63	SCALE —	SHEET 2 OF 3

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

CONNECTOR IDENTIFICATION	CONNECTOR FUNCTION	PIN IDENTIFICATION	PIN USE	NOTES
MS3112E-10-6P J1	INPUT	A	CHASSIS GROUND	
		B	SIGNAL INPUT HI	
		C	SIGNAL INPUT LO	
		D, E, F	SPARE	
MS3112E-20-41S J2	BCD	B C D F	1 2 4 8 } BCD	UNITS INDICATORS
		H J K L	1 2 4 8 } BCD	TENS INDICATORS
		M P S V	1 2 4 8 } BCD	HUNDREDS INDICATORS
		W X Z a	1 2 4 8 } BCD	THOUSANDS INDICATORS
		b c̄ e	1 2 4 } BCD	DECIMAL 7 POINT INDICATION
		f g k̄	1 2 4 } BCD	8 SYMBOL INDICATION
		j	PRINT COMMAND	TO PRINTER 9
		m	PRINT COMPLETE	FROM PRINTER
		n	LOGIC GROUND	
		A, E, G, N, R, d, h, i, , p̄, q, r, s, t	SPARES	
		T	+16ᵛ COMMON	FUNCTION SWITCH REMOTE 10
		U	DC MODE	
		Y	AC MODE	

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPD
		CHG NO.		

CONNECTOR IDENTIFICATION	CONNECTOR FUNCTION	PIN IDENTIFICATION	PIN USE	NOTES
UG-1094/U J3	INNER IS NORMALLY EXTERNALLY JUMPERED TO J4 INNER, EXCEPT WHEN THE SIGNAL INPUT IS BROUGHT DIRECTLY INTO J4 INNER.			
UG-1094/U J4	LO CAP AC INPUT	INNER CONDUCTOR	SIGNAL HI	
		OUTER CONDUCTOR	SHIELD OR LO	
MS3112E16-8P J5	POWER	A	CHASSIS	
		B	SPARE	
		C	SPARE	
		D	INPUT POWER HI	
		E	INPUT POWER LO	
		F, G, H	SPARES	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44294
DRAWN L. SOMMER DATE 2 NOV 62
CHECKED W. DIEHL 2 APR 63
APPROVAL 2-APR-63
APPROVAL 2 APR 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

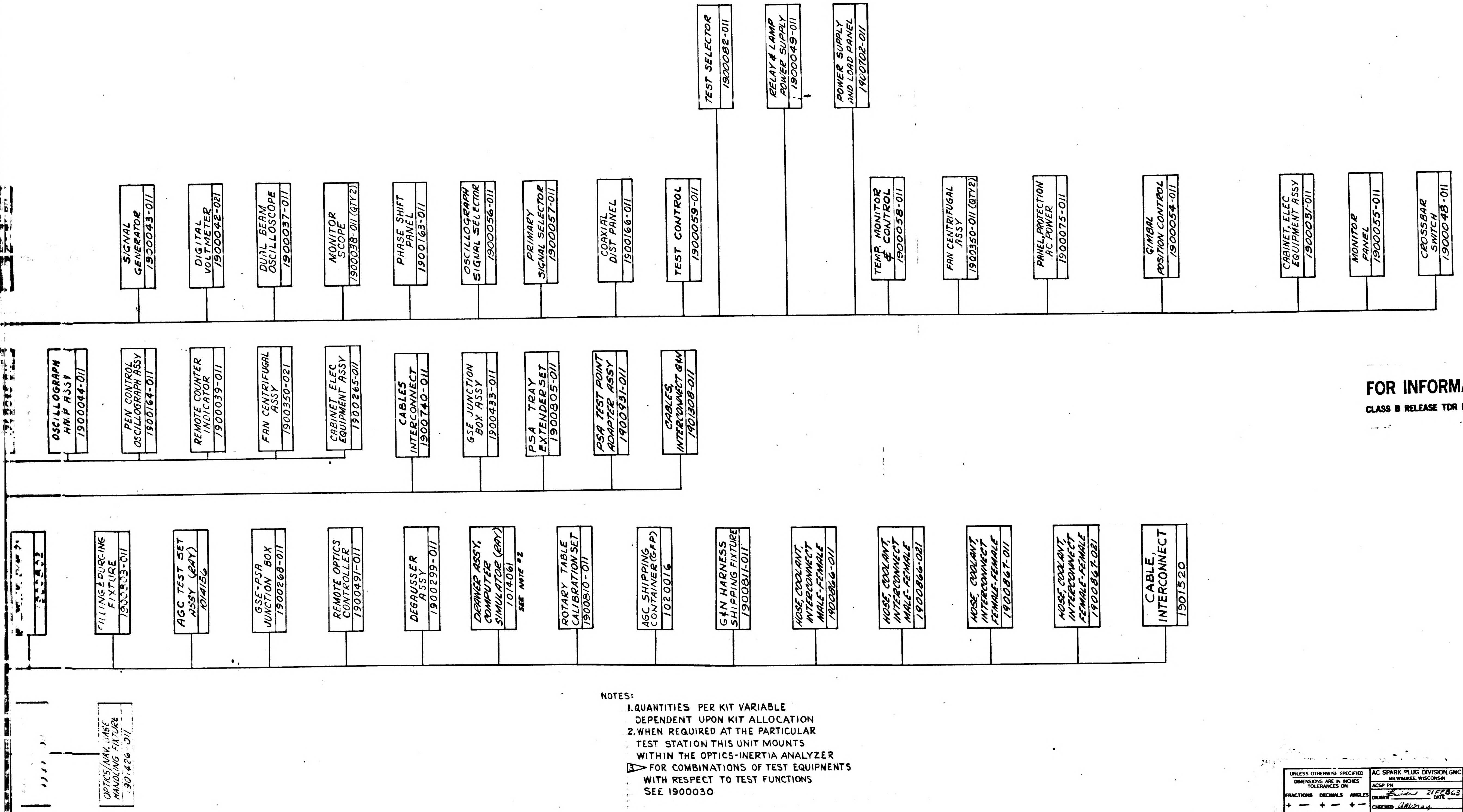
VOLTMETER, DIGITAL

CODE IDENT NO.
SIZE D
1900018
SCALE —
SHEET 3 OF 3

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO	DATE	APPD
A		COMPLETELY REVISED PER TDRR 08186	MXC 186521	4 JUN 63	ﾑINN / ﾑEFS
B		Ⓑ FOR REVISION SEE MXC-189046	MXC-189046	29 Nov 63	[illegible]
C		CHANGE IN ACCORDANCE WITH MXC 190237 PER TDRR 08186		14 NOV 63	GC / EH
D		CHANGE IN ACCORDANCE WITH MXC 190418 PER TDRR 08186		14 NOV 63	GC / EH
E		CHANGE IN ACCORDANCE WITH CM-193264 PER TDRR 08186		16 JAN 64	RTS / PBR
F		CHANGE IN ACCORDANCE WITH CN-194771 PER TDRR 08186		30 MAR 64	JR / R
G		CHANGE IN ACCORDANCE WITH CM 196586 REVISED PER TDRR 08186		APR 64	JC / PJ
H		REVISED PER TDRR 10641		29 JUN 64	FL / MEM
J		REVISED PER TDRR 10675		9 JUL 64	FL / PBR


TEST SELECTOR 1900082-011
RELAY & LAMP POWER SUPPLY 1900049-011
POWER SUPPLY AND LOAD PANEL 1900702-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-021
DUAL BEAM OSCILLOSCOPE 1900037-011
MONITOR SCOPE 1900038-011 (QTY 2)
PHASE SHIFT PANEL 1900163-011
OSCILLOGRAPH SIGNAL SELECTOR 1900056-011
PRIMARY SIGNAL SELECTOR 1900057-011
COAXIAL DIST PANEL 1900166-011
TEST CONTROL 1900059-011
TEMP MONITOR & CONTROL 1900058-011
FAN CENTRIFUGAL ASSY 1900350-011 (QTY 2)
PANEL, PROTECTION AC POWER 1900075-011
GIMBAL POSITION CONTROL 1900054-011
CABINET, ELEC EQUIPMENT ASSY 1900031-011
MONITOR PANEL 1900055-011
CROSSBAR SWITCH 1900048-011
OSCILLOGRAPH HN-F ASSY 1900044-011
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY 1900350-021
CABINET ELEC EQUIPMENT ASSY 1900265-011
CABLES INTERCONNECT 1900740-011
GSE JUNCTION BOX ASSY 1900433-011
PSA TRAY EXTENDER SET 1900805-011
PSA TEST POINT ADAPTER ASSY 1900931-011
CABLES, INTERCONNECT G&N 1901308-011
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA JUNCTION BOX 1900268-011
REMOTE OPTICS CONTROLLER 1900491-011
DEGAUSSER ASSY 1900299-011
DRAWER ASSY, COMPUTER SIMULATOR (RAY) 1014061
SEE NOTE #2
ROTARY TABLE CALIBRATION SET 1900810-011
AGC SHIPPING CONTAINER (GFP) 1020016
G&N HARNESS SHIPPING FIXTURE 1900811-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-021
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-011
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-021
CABLE, INTERCONNECT 1901520
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011

FOR INFORMATION ONLY

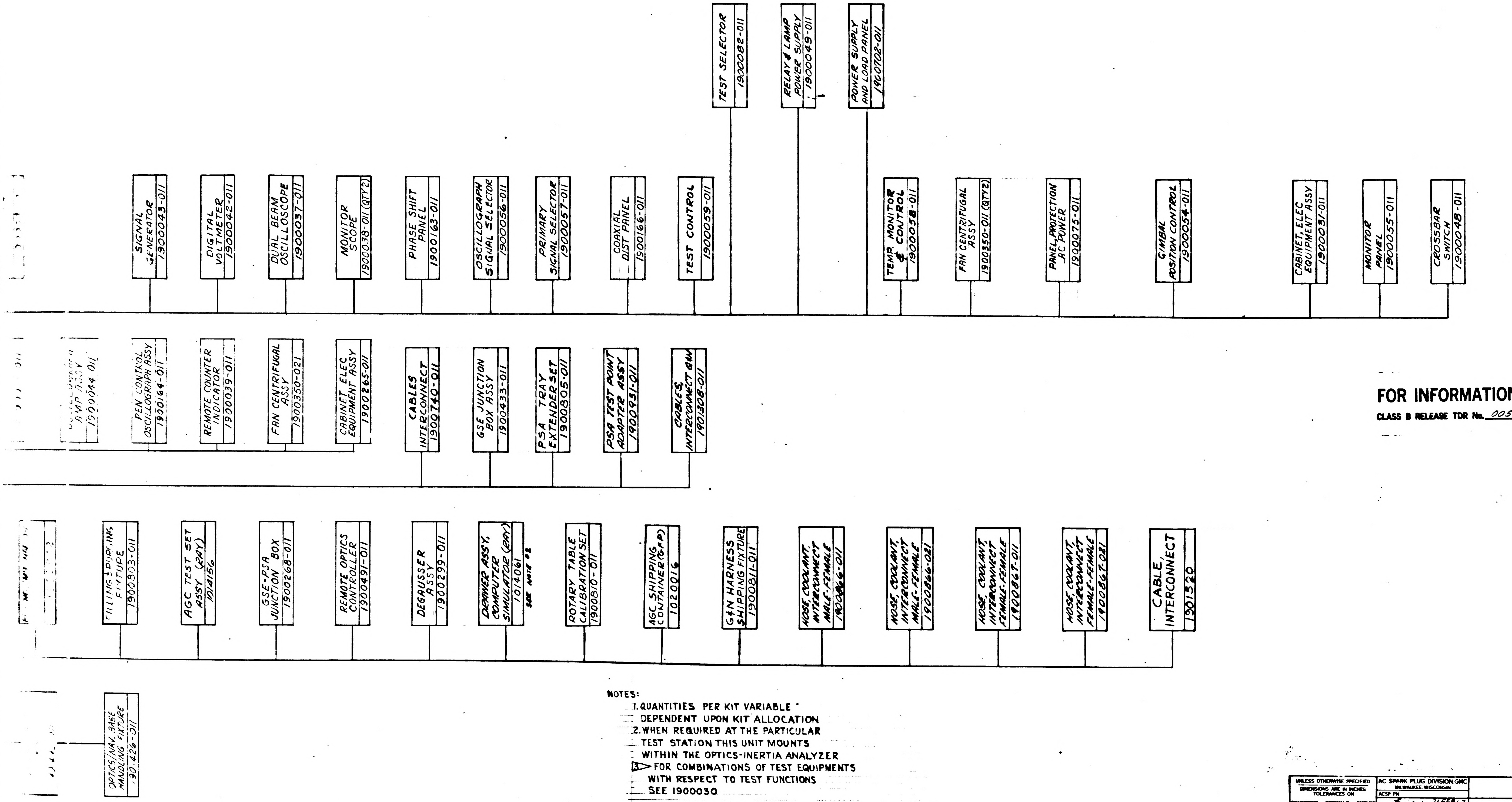
CLASS B RELEASE TDR No. 00553 DATE 13 MAR 1963

NOTES:

1. QUANTITIES PER KIT VARIABLE DEPENDENT UPON KIT ALLOCATION
2. WHEN REQUIRED AT THE PARTICULAR TEST STATION THIS UNIT MOUNTS WITHIN THE OPTICS-INERTIA ANALYZER
3. FOR COMBINATIONS OF TEST EQUIPMENTS WITH RESPECT TO TEST FUNCTIONS SEE 1900030

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — ± — ± —	AC SPARK PLUG DIVISION GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN Fr[illegible] DATE 21 FEB 63 CHECKED [illegible] APPROVAL [illegible] APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS GSE APOLLO FAMILY TREE DRAWING
DO NOT SCALE THIS DRAWING MATERIAL —	NASA APPROVAL [illegible] 13 March 1963 MIT APPROVAL [illegible] 63	CODE IDENT NO. SIZE J 1900019
CONTRACT NAS9-497		SCALE — SHEET OF

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		COMPLETELY REVISED PER TDRR 08186	MXC 196521	4 JUN 63	[illegible]
B		FOR REVISION SEE MXC-189046	MXC-189046	23 Nov 63	[illegible]
C		CHANGE IN ACCORDANCE WITH MXC 190237 PER TDRR 08186		14 NOV 63	GC E H
D		CHANGE IN ACCORDANCE WITH MXC 190418 PER TDRR 08186		14 NOV 63	GC E H
E		CHANGE IN ACCORDANCE WITH CM-193264 PER TDRR 08186		JAN 64	PBR
F		CHANGE IN ACCORDANCE WITH CV-194771 PER TDRR 08186		30 MAR 64	[illegible]
G		CHANGE IN ACCORDANCE WITH CR 36586 REVISED PER TDRR 08186		APR 64	PT


TEST SELECTOR 1900082-011
RELAY & LAMP POWER SUPPLY 1900049-011
POWER SUPPLY AND LOAD PANEL 1900702-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-011
DUAL BEAM OSCILLOSCOPE 1900037-011
MONITOR SCOPE 1900038-011 (QTY 2)
PHASE SHIFT PANEL 1900163-011
OSCILLOGRAPH SIGNAL SELECTOR 1900056-011
PRIMARY SIGNAL SELECTOR 1900057-011
COAXIAL DIST PANEL 1900166-011
TEST CONTROL 1900059-011
TEMP. MONITOR & CONTROL 1900058-011
FAN CENTRIFUGAL ASSY 1900350-011 (QTY 2)
PANEL, PROTECTION AC POWER 1900075-011
GIMBAL POSITION CONTROL 1900054-011
CABINET, ELEC EQUIPMENT ASSY 1900031-011
MONITOR PANEL 1900055-011
CROSSBAR SWITCH 1900048-011
AMP ASSY 1900044-011
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY 1900350-021
CABINET ELEC EQUIPMENT ASSY 1900265-011
CABLES INTERCONNECT 1900740-011
GSE JUNCTION BOX ASSY 1900433-011
PSA TRAY EXTENDER SET 1900805-011
PSA TEST POINT ADAPTER ASSY 1900931-011
CABLES, INTERCONNECT G&N 1901308-011
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA JUNCTION BOX 1900268-011
REMOTE OPTICS CONTROLLER 1900491-011
DEGAUSSER ASSY 1900299-011
DRAWER ASSY, COMPUTER SIMULATOR (RAY) 1014061
SEE NOTE #2
ROTARY TABLE CALIBRATION SET 1900810-011
AGC SHIPPING CONTAINER (GFP) 1020016
G&N HARNESS SHIPPING FIXTURE 1900811-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-021
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-011
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-021
CABLE, INTERCONNECT 1901520
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 1963

NOTES:
1. QUANTITIES PER KIT VARIABLE DEPENDENT UPON KIT ALLOCATION
2. WHEN REQUIRED AT THE PARTICULAR TEST STATION THIS UNIT MOUNTS WITHIN THE OPTICS-INERTIA ANALYZER
3▷ FOR COMBINATIONS OF TEST EQUIPMENTS WITH RESPECT TO TEST FUNCTIONS SEE 1900030

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

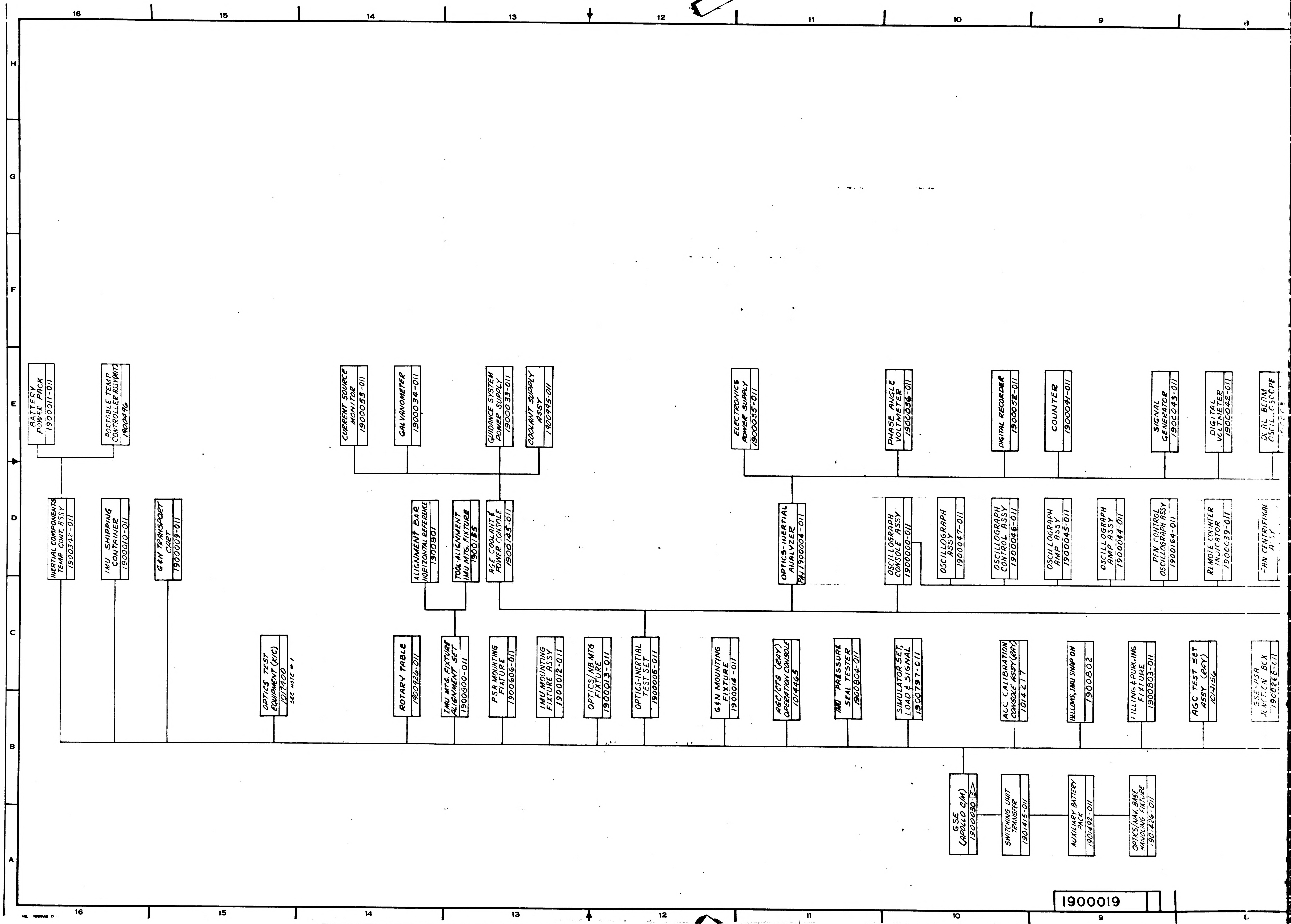
AC SPARK PLUG DIVISION GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Fiedler DATE 21 FEB 63
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL 13 March 1963
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GSE APOLLO
FAMILY TREE DRAWING

CODE IDENT NO.
SIZE J
1900019
SCALE —
SHEET

1900019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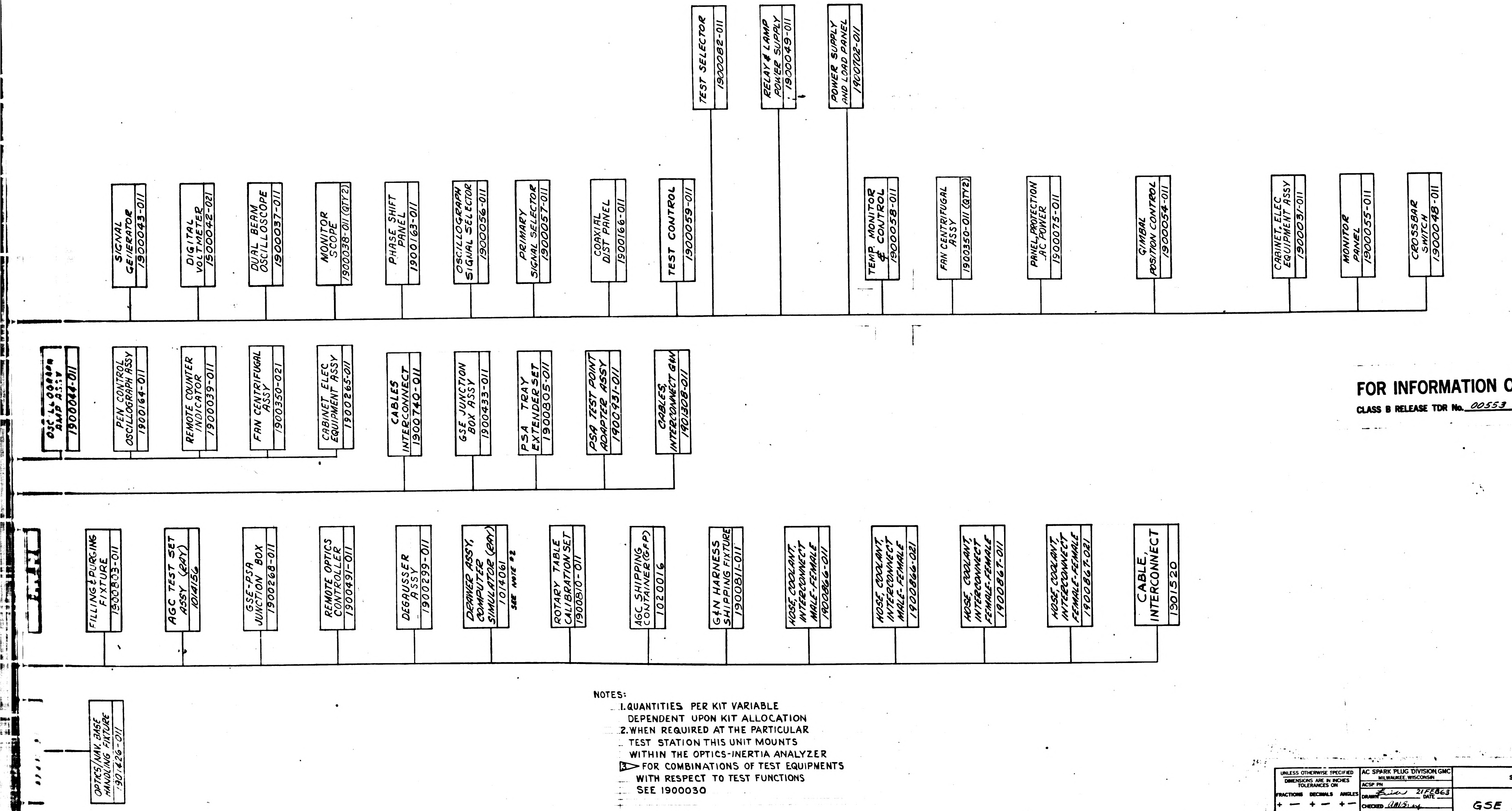
BATTERY POWER PACK 1900011-011
PORTABLE TEMP CONTROLLER ASSY(MIT) 1900496
CURRENT SOURCE MONITOR 1900053-011
GALVANOMETER 1900034-011
GUIDANCE SYSTEM POWER SUPPLY 1900033-011
COOLANT SUPPLY ASSY 1900995-011
ELECTRONICS POWER SUPPLY 1900035-011
PHASE ANGLE VOLTMETER 1900036-011
DIGITAL RECORDER 1900052-011
COUNTER 1900041-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-011
DUAL BEAM OSCILLOSCOPE
INERTIAL COMPONENTS TEMP. CONT. ASSY 1900342-011
IMU SHIPPING CONTAINER 1900010-011
G&N TRANSPORT CART 1900009-011
ALIGNMENT BAR HORIZONTAL REFERENCE 1900801
TOOL ALIGNMENT IMU MTG. FIXTURE 1900135
AGE COOLANT & POWER CONSOLE 1900145-011
OPTICS-INERTIAL ANALYZER P/N 1900004-011
OSCILLOGRAPH CONSOLE ASSY 1900000-011
OSCILLOGRAPH ASSY 1900047-011
OSCILLOGRAPH CONTROL ASSY 1900046-011
OSCILLOGRAPH AMP ASSY 1900045-011
OSCILLOGRAPH AMP ASSY 1900044-011
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY
OPTICS TEST EQUIPMENT (K/C) 1017400
SEE NOTE #1
ROTARY TABLE 1900926-011
IMU MTG. FIXTURE ALIGNMENT SET 1900800-011
PSA MOUNTING FIXTURE 1900606-011
IMU MOUNTING FIXTURE ASSY 1900012-011
OPTICS/NB MTG FIXTURE 1900013-011
OPTICS-INERTIAL TEST SET 1900005-011
G&N MOUNTING FIXTURE 1900014-011
AGC/CTS (RAY) OPERATION CONSOLE 1014463
IMU PRESSURE SEAL TESTER 1900804-011
SIMULATOR SET, LOAD & SIGNAL 1900797-011
AGC CALIBRATION CONSOLE ASSY (RAY) 1014217
BELLOWS, IMU SNAP ON 1900802
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA JUNCTION BOX 1900266-011
GSE (APOLLO C/M) 1900030-3
SWITCHING UNIT TRANSFER 1901415-011
AUXILIARY BATTERY PACK 1901492-011
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011
1900019

1/1900019

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		COMPLETELY REVISED PER TDRR 08186	MXC 186521	4 JUN 63	LINN / LIEFS
B1		Ⓑ FOR REVISION SEE MXC-189046	MXC-189046	23 JUN 63	JE / TM
C		CHANGE IN ACCORDANCE WITH MXC 190237 PER TDRR 08186		14 NOV 63	GC / EH
D		CHANGE IN ACCORDANCE WITH MXC 190418 PER TDRR 08186		14 NOV 63	GC / EH
E		CHANGE IN ACCORDANCE WITH CM-193264 PER TDRR 08186		14 JAN 64	RJS / PBR
F		CHANGE IN ACCORDANCE WITH CV-194771 PER TDRR 08186		30 MAR 64	JR / R
G		CHANGE IN ACCORDANCE WITH CM 196586 REVISED PER TDRR 08186		14 APR 64	JC / PF
H		REVISED PER TDRR 10411		29 JUN 64	FL / MEM



TEST SELECTOR 1900082-011
RELAY & LAMP POWER SUPPLY 1900049-011
POWER SUPPLY AND LOAD PANEL 1900702-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-021
DUAL BEAM OSCILLOSCOPE 1900037-011
MONITOR SCOPE 1900038-011 (QTY 2)
PHASE SHIFT PANEL 1900163-011
OSCILLOGRAPH SIGNAL SELECTOR 1900056-011
PRIMARY SIGNAL SELECTOR 1900057-011
COAXIAL DIST PANEL 1900166-011
TEST CONTROL 1900059-011
TEMP. MONITOR & CONTROL 1900058-011
FAN CENTRIFUGAL ASSY 1900350-011 (QTY 2)
PANEL, PROTECTION AC POWER 1900075-011
GIMBAL POSITION CONTROL 1900054-011
CABINET, ELEC EQUIPMENT ASSY 1900031-011
MONITOR PANEL 1900055-011
CROSSBAR SWITCH 1900048-011
OSC'LLOGRAPH AMP ASSY 1900044-011
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY 1900350-021
CABINET ELEC EQUIPMENT ASSY 1900265-011
CABLES INTERCONNECT 1900740-011
GSE JUNCTION BOX ASSY 1900433-011
PSA TRAY EXTENDER SET 1900805-011
PSA TEST POINT ADAPTER ASSY 1900931-011
CABLES, INTERCONNECT G&N 1901308-011
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA JUNCTION BOX 1900268-011
REMOTE OPTICS CONTROLLER 1900491-011
DEGAUSSER ASSY 1900299-011
DRAWER ASSY, COMPUTER SIMULATOR (RAY) 1014061
SEE NOTE #2
ROTARY TABLE CALIBRATION SET 1900810-011
AGC SHIPPING CONTAINER (GFP) 1020016
G&N HARNESS SHIPPING FIXTURE 1900811-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-021
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-011
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-021
CABLE, INTERCONNECT 1901520
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 1963

NOTES:
1. QUANTITIES PER KIT VARIABLE DEPENDENT UPON KIT ALLOCATION
2. WHEN REQUIRED AT THE PARTICULAR TEST STATION THIS UNIT MOUNTS WITHIN THE OPTICS-INERTIA ANALYZER
3. FOR COMBINATIONS OF TEST EQUIPMENTS WITH RESPECT TO TEST FUNCTIONS SEE 1900030

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Eric DATE 21FEB63
CHECKED AMBrey
APPROVAL
APPROVAL
NASA APPROVAL 13 July 1963
MIT APPROVAL 1 Aug. 63

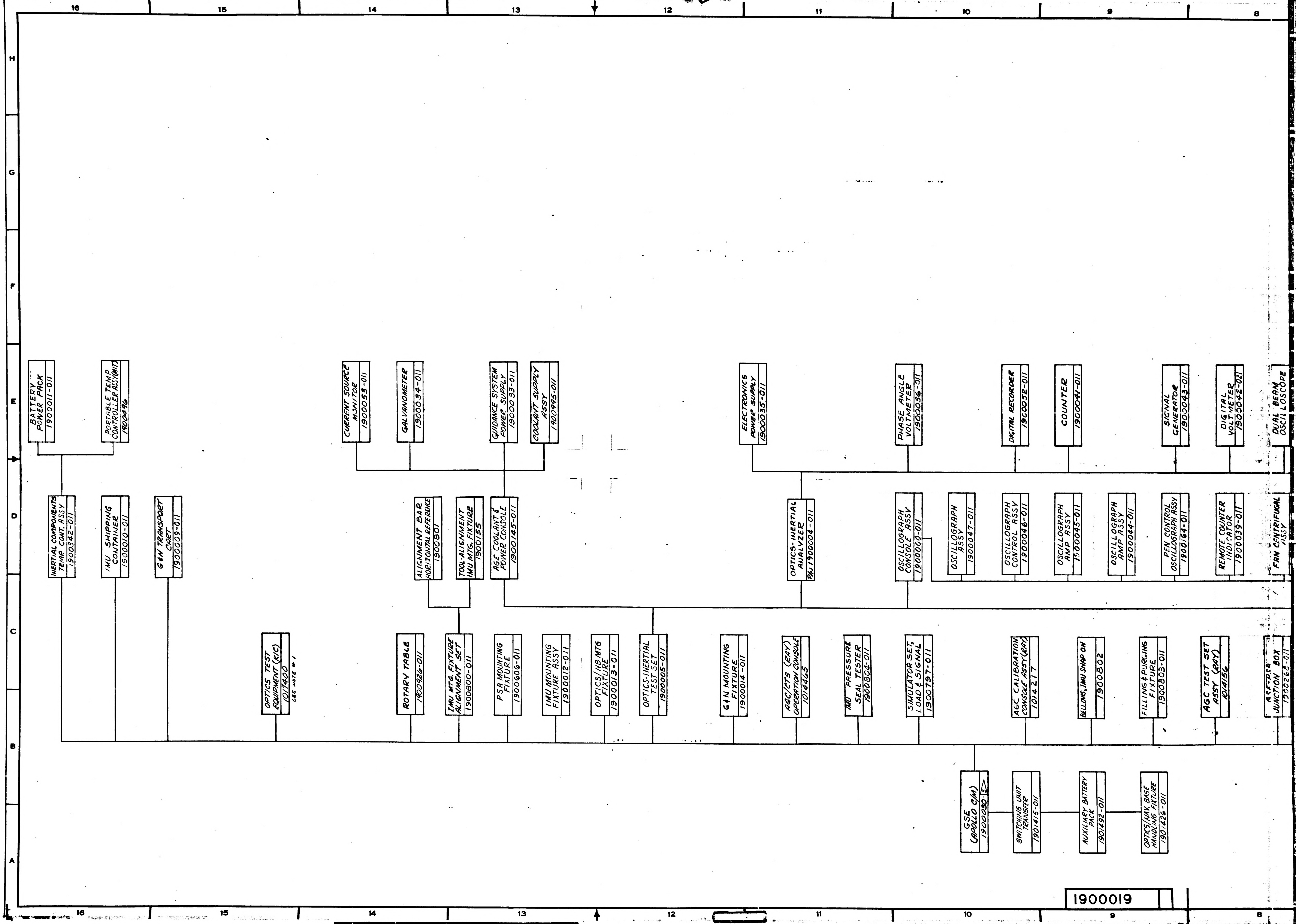
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GSE APOLLO
FAMILY TREE DRAWING

CODE IDENT NO. SIZE J 1900019
SCALE — SHEET OF

1900019 H

27 1900019


BATTERY POWER PACK 1900011-011
PORTABLE TEMP CONTROLLER ASSY(UNIT) 1900496
CURRENT SOURCE MONITOR 1900053-011
GALVANOMETER 1900034-011
GUIDANCE SYSTEM POWER SUPPLY 1900033-011
COOLANT SUPPLY ASSY 1900995-011
ELECTRONICS POWER SUPPLY 1900035-011
PHASE ANGLE VOLTMETER 1900036-011
DIGITAL RECORDER 1900052-011
COUNTER 1900041-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-021
DUAL BEAM OSCILLOSCOPE
INERTIAL COMPONENTS TEMP CONT. ASSY 1900342-011
IMU SHIPPING CONTAINER 1900010-011
G&N TRANSPORT CART 1900009-011
ALIGNMENT BAR HORIZONTAL REFERENCE 1900801
TOOL-ALIGNMENT IMU MTG. FIXTURE 1900155
AGE COOLANT & POWER CONSOLE 1900145-011
OPTICS-INERTIAL ANALYZER P/N 1900004-011
OSCILLOGRAPH CONSOLE ASSY 1900000-011
OSCILLOGRAPH ASSY 1900047-011
OSCILLOGRAPH CONTROL ASSY 1900046-011
OSCILLOGRAPH AMP ASSY 1900045-011
OSCILLOGRAPH AMP ASSY 1900044-011
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY
OPTICS TEST EQUIPMENT (KIC) 1017400 SEE NOTE #1
ROTARY TABLE 1900326-011
IMU MTG. FIXTURE ALIGNMENT SET 1900800-011
PSA MOUNTING FIXTURE 1900606-011
IMU MOUNTING FIXTURE ASSY 1900012-011
OPTICS/NB MTG FIXTURE 1900013-011
OPTICS-INERTIAL TEST SET 1900005-011
G&N MOUNTING FIXTURE 1900014-011
AGC/CTS (RAY) OPERATION CONSOLE 1014465
IMU PRESSURE SEAL TESTER 1900804-011
SIMULATOR SET, LOAD & SIGNAL 1900797-011
AGC CALIBRATION CONSOLE ASSY (RAY) 1014217
BELLOWS, IMU SNAP ON 1900802
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
RSF-PSA JUNCTION BOX 1900268-011
GSE (APOLLO C/M) 1900080 3
SWITCHING UNIT TRANSFER 1901415-011
AUXILIARY BATTERY PACK 1901492-011
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011
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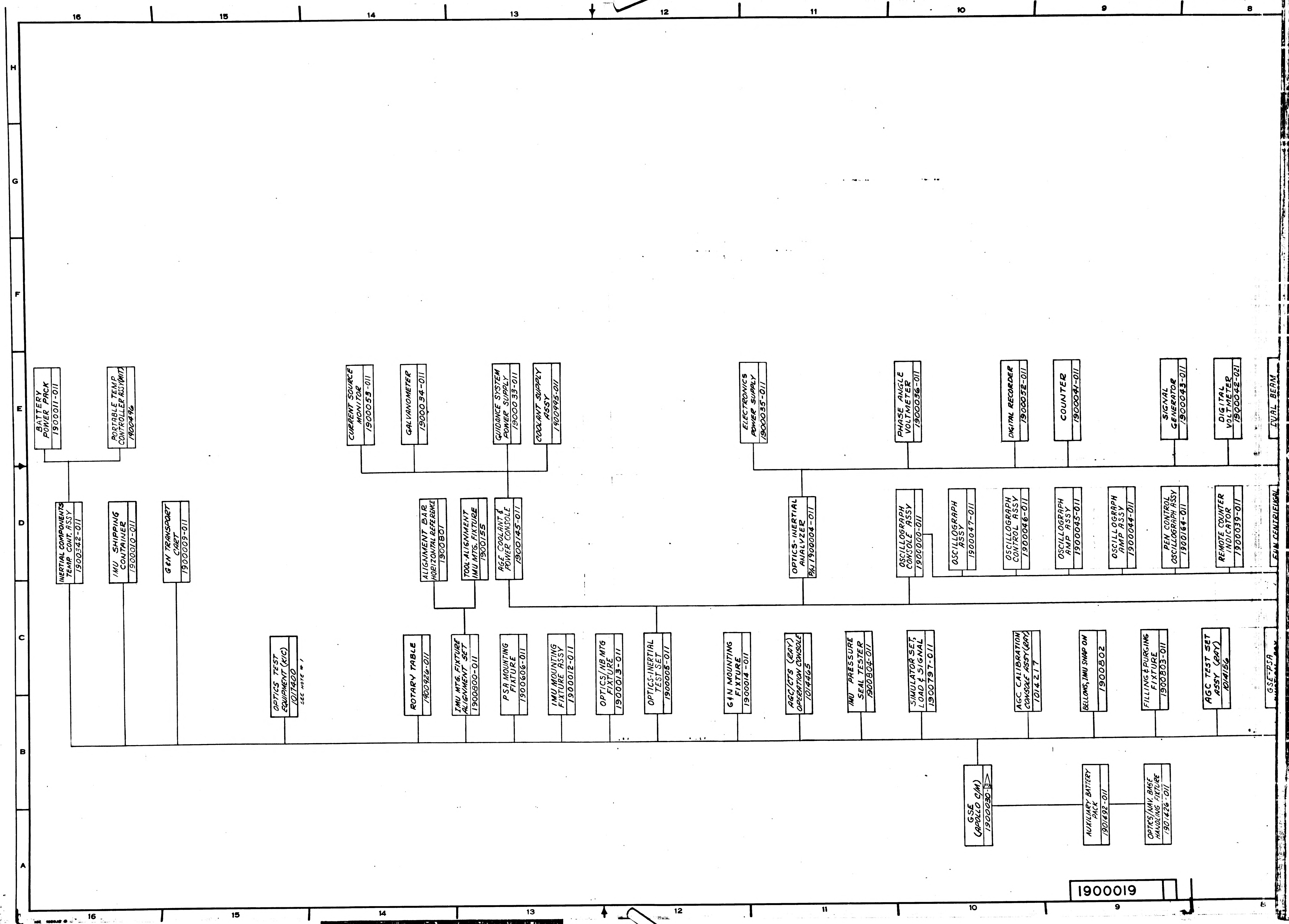

BATTERY POWER PACK 1900011-011
PORTABLE TEMP CONTROLLER ASSY (MIT) 1900496
INERTIAL COMPONENTS TEMP. CONT. ASSY 1900342-011
IMU SHIPPING CONTAINER 1900010-011
G&N TRANSPORT CART 1900009-011
OPTICS TEST EQUIPMENT (K/C) 1017400 SEE NOTE # 1
CURRENT SOURCE MONITOR 1900053-011
GALVANOMETER 1900034-011
GUIDANCE SYSTEM POWER SUPPLY 1900033-011
COOLANT SUPPLY ASSY 1900995-011
ALIGNMENT BAR HORIZONTAL REFERENCE 1900801
TOOL-ALIGNMENT IMU MTG. FIXTURE 1900155
AGE COOLANT & POWER CONSOLE 1900145-011
ROTARY TABLE 1900926-011
IMU MTG. FIXTURE ALIGNMENT SET 1900800-011
PSA MOUNTING FIXTURE 1900606-011
IMU MOUNTING FIXTURE ASSY 1900012-011
OPTICS/NB MTG FIXTURE 1900013-011
OPTICS-INERTIAL TEST SET 1900005-011
ELECTRONICS POWER SUPPLY 1900035-011
OPTICS-INERTIAL ANALYZER P/N 1900004-011
PHASE ANGLE VOLTMETER 1900036-011
DIGITAL RECORDER 1900052-011
COUNTER 1900041-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-021
DUAL BEAM
OSCILLOGRAPH CONSOLE ASSY 1900000-011
OSCILLOGRAPH ASSY 1900047-011
OSCILLOGRAPH CONTROL ASSY 1900046-011
OSCILLOGRAPH AMP ASSY 1900045-011
OSCILLOGRAPH AMP ASSY 1900044-011
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL
G&N MOUNTING FIXTURE 1900014-011
AGC/CTS (RAY) OPERATION CONSOLE 1014465
IMU PRESSURE SEAL TESTER 1900804-011
SIMULATOR SET, LOAD & SIGNAL 1900797-011
AGC CALIBRATION CONSOLE ASSY (RAY) 1014217
BELLOWS, IMU SNAP ON 1900802
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA
GSE (APOLLO C/M) 1900030-3
AUXILIARY BATTERY PACK 1901492-011
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011
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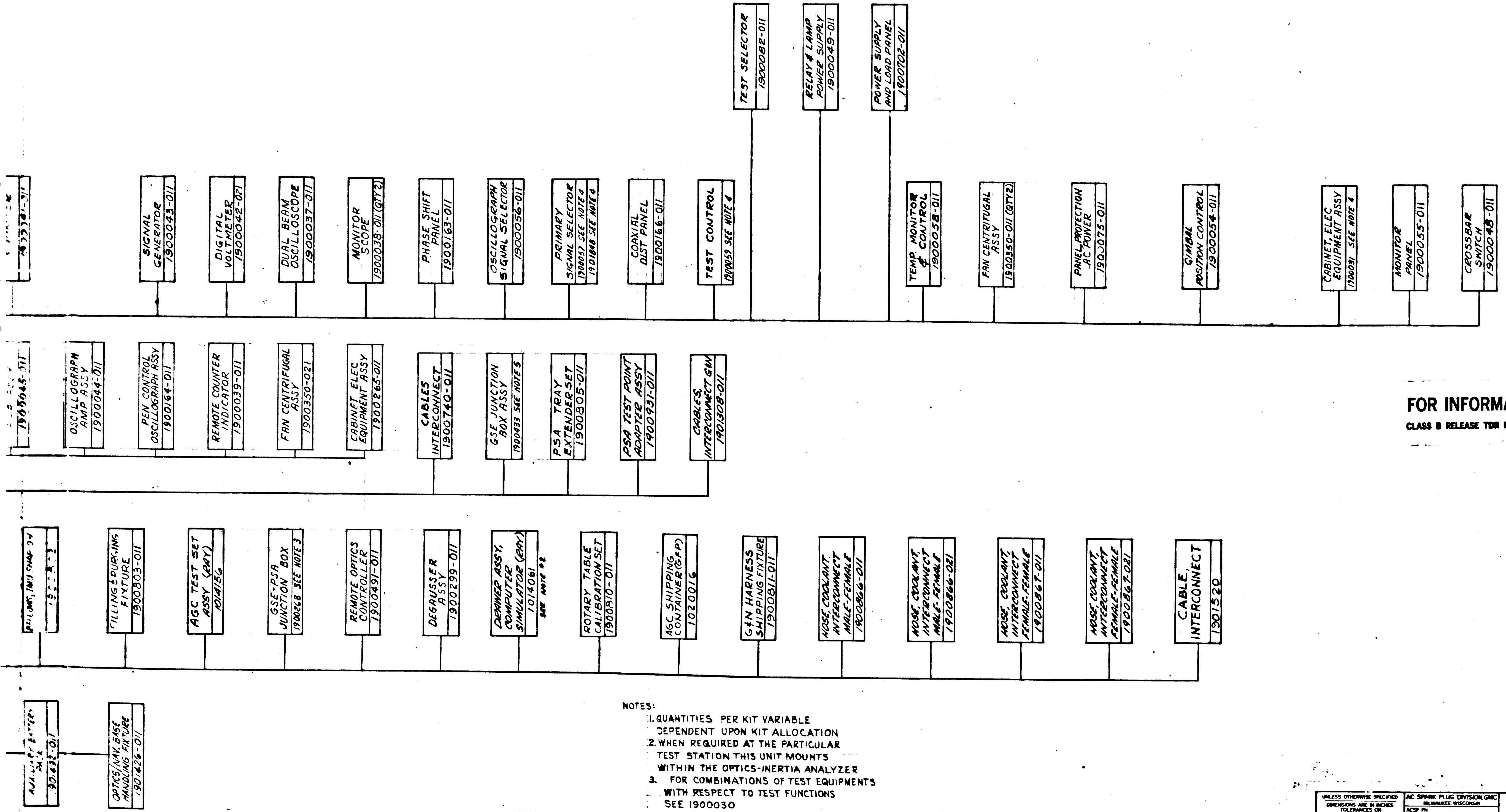
1900019

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		COMPLETELY REVISED PER TDRR 08186	MXC 186521	4 JUN 63	
B		FOR REVISION SEE MXC-189046	MXC-189046	63	
C		CHANGE IN ACCORDANCE WITH MXC 190237 PER TDRR 08186		14 NOV 63	GC
D		CHANGE IN ACCORDANCE WITH MXC 190418 PER TDRR 08186		14 NOV 63	GC
E		CHANGE IN ACCORDANCE WITH CM-193264 PER TDRR 08186		JAN 64	PBR
F		CHANGE IN ACCORDANCE WITH CV-19477 PER TDRR 08186		30 MAR 64	
G		CHANGE IN ACCORDANCE WITH CA 196586 REVISED PER TDRR 08186		64	JC
H		REVISED PER TDRR 10414		29 JUN 64	FL
J		REVISED PER TDRR 10675		7 JUL 64	FL PBR
K		CHANGE IN ACCORDANCE WITH CA 99879 REVISED PER TDRR 13067		1 SEP 64	


TEST SELECTOR
1900082-011
RELAY & LAMP POWER SUPPLY
1900049-011
POWER SUPPLY AND LOAD PANEL
1900702-011
SIGNAL GENERATOR
1900043-011
DIGITAL VOLTMETER
1900042-021
DUAL BEAM OSCILLOSCOPE
1900037-011
MONITOR SCOPE
1900038-011 (QTY 2)
PHASE SHIFT PANEL
1900163-011
OSCILLOGRAPH SIGNAL SELECTOR
1900056-011
PRIMARY SIGNAL SELECTOR
1900057 SEE NOTE 4
1901848 SEE NOTE 4
COAXIAL DIST PANEL
1900166-011
TEST CONTROL
1900059 SEE NOTE 4
TEMP. MONITOR & CONTROL
1900058-011
FAN CENTRIFUGAL ASSY
1900350-011 (QTY 2)
PANEL, PROTECTION AC POWER
1900075-011
GIMBAL POSITION CONTROL
1900054-011
CABINET, ELEC EQUIPMENT ASSY
1900031 SEE NOTE 4
MONITOR PANEL
1900055-011
CROSSBAR SWITCH
1900048-011
OSCILLOGRAPH AMP ASSY
1900044-011
PEN CONTROL OSCILLOGRAPH ASSY
1900164-011
REMOTE COUNTER INDICATOR
1900039-011
FAN CENTRIFUGAL ASSY
1900350-021
CABINET ELEC EQUIPMENT ASSY
1900265-011
CABLES INTERCONNECT
1900740-011
GSE JUNCTION BOX ASSY
1900433 SEE NOTE 5
PSA TRAY EXTENDER SET
1900805-011
PSA TEST POINT ADAPTER ASSY
1900931-011
CABLES, INTERCONNECT G&N
1901308-011
FILLING & PURGING FIXTURE
1900803-011
AGC TEST SET ASSY (RAY)
1014156
GSE-PSA JUNCTION BOX
1900268 SEE NOTE 3
REMOTE OPTICS CONTROLLER
1900491-011
DEGAUSSER ASSY
1900299-011
DRAWER ASSY, COMPUTER SIMULATOR (RAY)
1014061
SEE NOTE #2
ROTARY TABLE CALIBRATION SET
1900810-011
AGC SHIPPING CONTAINER (GFP)
1020016
G&N HARNESS SHIPPING FIXTURE
1900811-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE
1900866-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE
1900866-021
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE
1900867-011
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE
1900867-021
CABLE, INTERCONNECT
1901520
AUXILIARY BATTERY PACK
1901692-011
OPTICS/NAV. BASE HANDLING FIXTURE
1901426-011

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 Mar 1963

NOTES:

1. QUANTITIES PER KIT VARIABLE DEPENDENT UPON KIT ALLOCATION
2. WHEN REQUIRED AT THE PARTICULAR TEST STATION THIS UNIT MOUNTS WITHIN THE OPTICS-INERTIA ANALYZER
3. FOR COMBINATIONS OF TEST EQUIPMENTS WITH RESPECT TO TEST FUNCTIONS SEE 1900030
4. FOR APPROPRIATE PART NUMBER OR DASH NUMBER SEE 1900004
5. FOR APPROPRIATE PART NUMBER OR DASH NUMBER SEE 1900005

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 21 FEB 63 DATE
CHECKED AM Gray
APPROVAL
APPROVAL
NASA APPROVAL 13 March 1963
MIT APPROVAL Mar 63

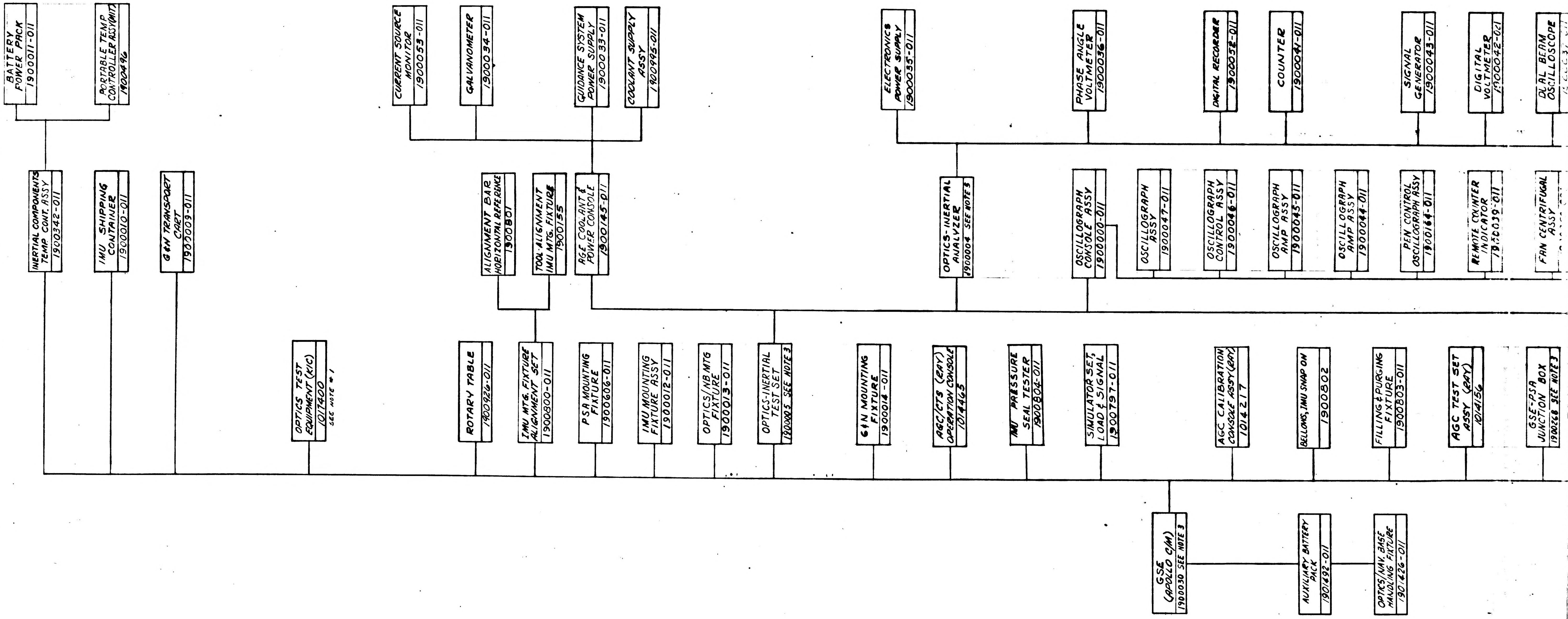
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GSE APOLLO
FAMILY TREE DRAWING

CODE IDENT NO.
SIZE J
1900019
SCALE —
SHEET OF

1900019

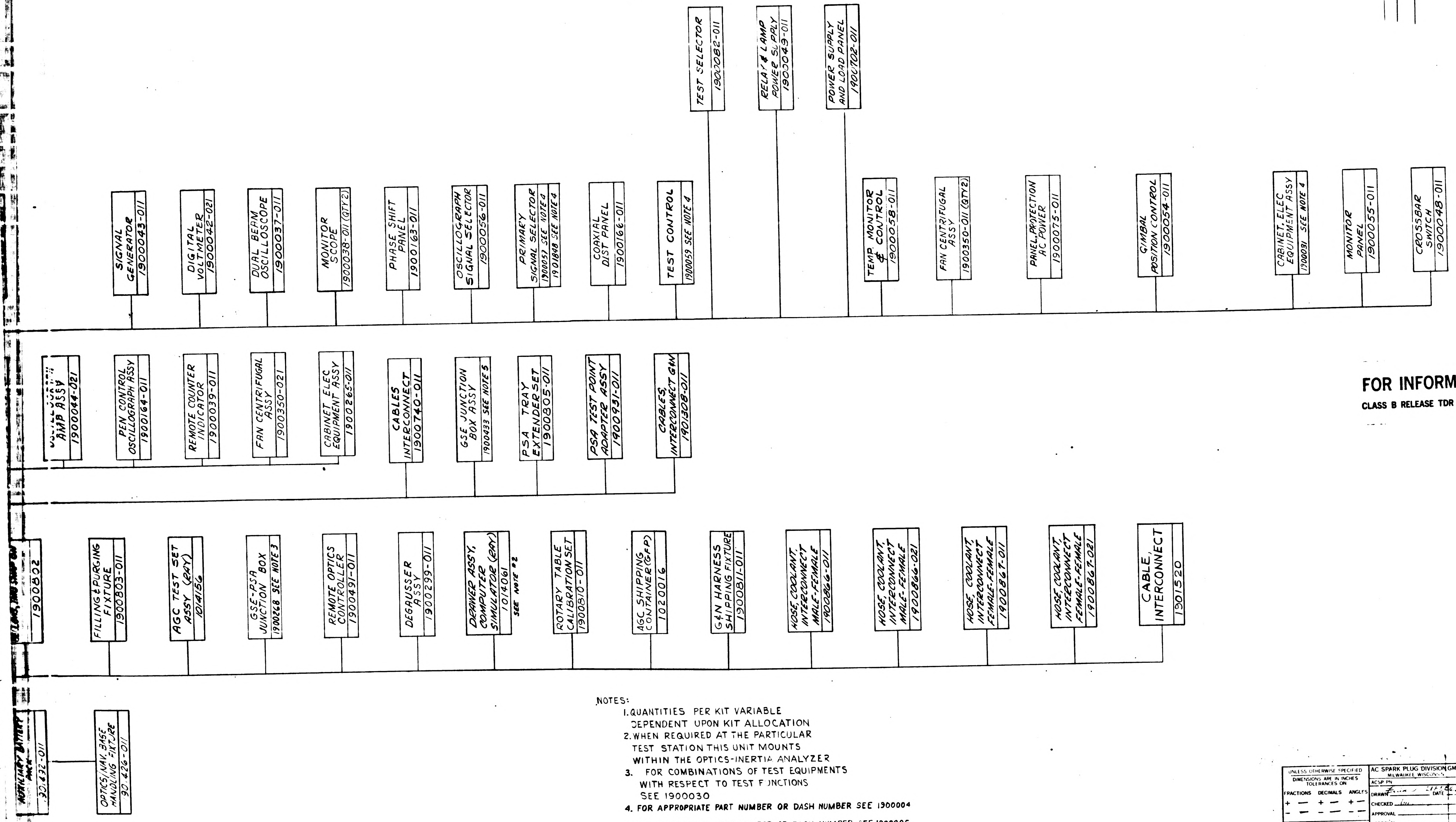
2/1900019


BATTERY POWER PACK 1900011-011
PORTABLE TEMP CONTROLLER ASSY(MIT) 1900496
CURRENT SOURCE MONITOR 1900053-011
GALVANOMETER 1900034-011
GUIDANCE SYSTEM POWER SUPPLY 1900033-011
COOLANT SUPPLY ASSY 1900995-011
ELECTRONICS POWER SUPPLY 1900035-011
PHASE ANGLE VOLTMETER 1900036-011
DIGITAL RECORDER 1900052-011
COUNTER 1900041-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-021
DUAL BEAM OSCILLOSCOPE
INERTIAL COMPONENTS TEMP. CONT. ASSY 1900342-011
IMU SHIPPING CONTAINER 1900010-011
G&N TRANSPORT CART 1900009-011
ALIGNMENT BAR HORIZONTAL REFERENCE 1900801
TOOL ALIGNMENT IMU MTG. FIXTURE 1900155
AGE COOLANT & POWER CONSOLE 1900145-011
OPTICS-INERTIAL ANALYZER 1900004 SEE NOTE 3
OSCILLOGRAPH CONSOLE ASSY 1900000-011
OSCILLOGRAPH ASSY 1900047-011
OSCILLOGRAPH CONTROL ASSY 1900046-011
OSCILLOGRAPH AMP ASSY 1900045-011
OSCILLOGRAPH AMP ASSY 1900044-011
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY
OPTICS TEST EQUIPMENT (KIC) 1017400 SEE NOTE # 1
ROTARY TABLE 1900926-011
IMU MTG. FIXTURE ALIGNMENT SET 1900800-011
PSA MOUNTING FIXTURE 1900606-011
IMU MOUNTING FIXTURE ASSY 1900012-011
OPTICS/NB MTG FIXTURE 1900013-011
OPTICS-INERTIAL TEST SET 1900005 SEE NOTE 3
G&N MOUNTING FIXTURE 1900014-011
AGC/CTS (RAY) OPERATION CONSOLE 1014463
IMU PRESSURE SEAL TESTER 1900804-011
SIMULATOR SET, LOAD & SIGNAL 1900797-011
AGC CALIBRATION CONSOLE ASSY (RAY) 1014217
BELLOWS, IMU SNAP ON 1900802
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA JUNCTION BOX 1900268 SEE NOTE 3
GSE (APOLLO C/M) 1900030 SEE NOTE 3
AUXILIARY BATTERY PACK 1901492-011
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011

1900019

1/1900019

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		COMPLETELY REVISED PER TDRR 08186	MXC 186521	4 JUN 63	JNN JEFS
B		FOR REVISION SEE MXC-189046	MXC-189046	23 63	
C		CHANGE IN ACCORDANCE WITH MXC 190237 8186		14 NOV 63	GC
D		CHANGE IN ACCORDANCE WITH MXC 190418 PER TDRR 08186		14 NOV 63	GC
E		CHANGE IN ACCORDANCE WITH CM-193264 PER TDRR 08186		14 JAN 64	RJS PBR
F		CHANGE IN ACCORDANCE WITH CM-194771 PER TDRR 08186		30 MAR 64	JK
G		CHANGE IN ACCORDANCE WITH CM 196586 REVISED PER TDRR 08186		7 APR 64	JC PT
H		REVISED PER TDRR 10411		29 JUN 64	FL MEM
J		REVISED PER TDRR 10675		7 JUL 64	FL PBR
K		CHANGE IN ACCORDANCE WITH CM 199879 REVISED PER TDRR 13067		1 SEP 64	JK PT
L		CHANGED IN ACCORDANCE WITH CM 303997 TORR 14925		27 OCT 64	PHG


TEST SELECTOR 1900082-011
RELAY & LAMP POWER SUPPLY 1900049-011
POWER SUPPLY AND LOAD PANEL 1900702-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-021
DUAL BEAM OSCILLOSCOPE 1900037-011
MONITOR SCOPE 1900038-011 (QTY 2)
PHASE SHIFT PANEL 1900163-011
OSCILLOGRAPH SIGNAL SELECTOR 1900056-011
PRIMARY SIGNAL SELECTOR 1900057 SEE NOTE 4 1901848 SEE NOTE 4
COAXIAL DIST PANEL 1900166-011
TEST CONTROL 1900059 SEE NOTE 4
TEMP. MONITOR & CONTROL 1900058-011
FAN CENTRIFUGAL ASSY 1900350-011 (QTY 2)
PANEL, PROTECTION AC POWER 1900075-011
GIMBAL POSITION CONTROL 1900054-011
CABINET, ELEC EQUIPMENT ASSY 1900031 SEE NOTE 4
MONITOR PANEL 1900055-011
CROSSBAR SWITCH 1900048-011
AMP ASSY 1900044-021
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY 1900350-021
CABINET ELEC EQUIPMENT ASSY 1900265-011
CABLES INTERCONNECT 1900740-011
GSE JUNCTION BOX ASSY 1900433 SEE NOTE 5
PSA TRAY EXTENDER SET 1900805-011
PSA TEST POINT ADAPTER ASSY 1900931-011
CABLES, INTERCONNECT G&N 1901308-011
1900802
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA JUNCTION BOX 1900268 SEE NOTE 3
REMOTE OPTICS CONTROLLER 1900491-011
DEGAUSSER ASSY 1900299-011
DRAWER ASSY, COMPUTER SIMULATOR (RAY) 1014061
SEE NOTE #2
ROTARY TABLE CALIBRATION SET 1900810-011
AGC SHIPPING CONTAINER (GFP) 1020016
G&N HARNESS SHIPPING FIXTURE 1900811-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-011
HOSE, COOLANT, INTERCONNECT MALE-FEMALE 1900866-021
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-011
HOSE, COOLANT, INTERCONNECT FEMALE-FEMALE 1900867-021
CABLE, INTERCONNECT 1901520
AUXILIARY BATTERY PACK 901432-011
OPTICS/NAV. BASE HANDLING FIXTURE 90426-011

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 **DATE** 13 MAR 1963

NOTES:

1. QUANTITIES PER KIT VARIABLE DEPENDENT UPON KIT ALLOCATION
2. WHEN REQUIRED AT THE PARTICULAR TEST STATION THIS UNIT MOUNTS WITHIN THE OPTICS-INERTIA ANALYZER
3. FOR COMBINATIONS OF TEST EQUIPMENTS WITH RESPECT TO TEST FUNCTIONS SEE 1900030
4. FOR APPROPRIATE PART NUMBER OR DASH NUMBER SEE 1900004
5. FOR APPROPRIATE PART NUMBER OR DASH NUMBER SEE 1900005

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN DATE 21 FEB 63
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL 13 March 1963
MIT APPROVAL

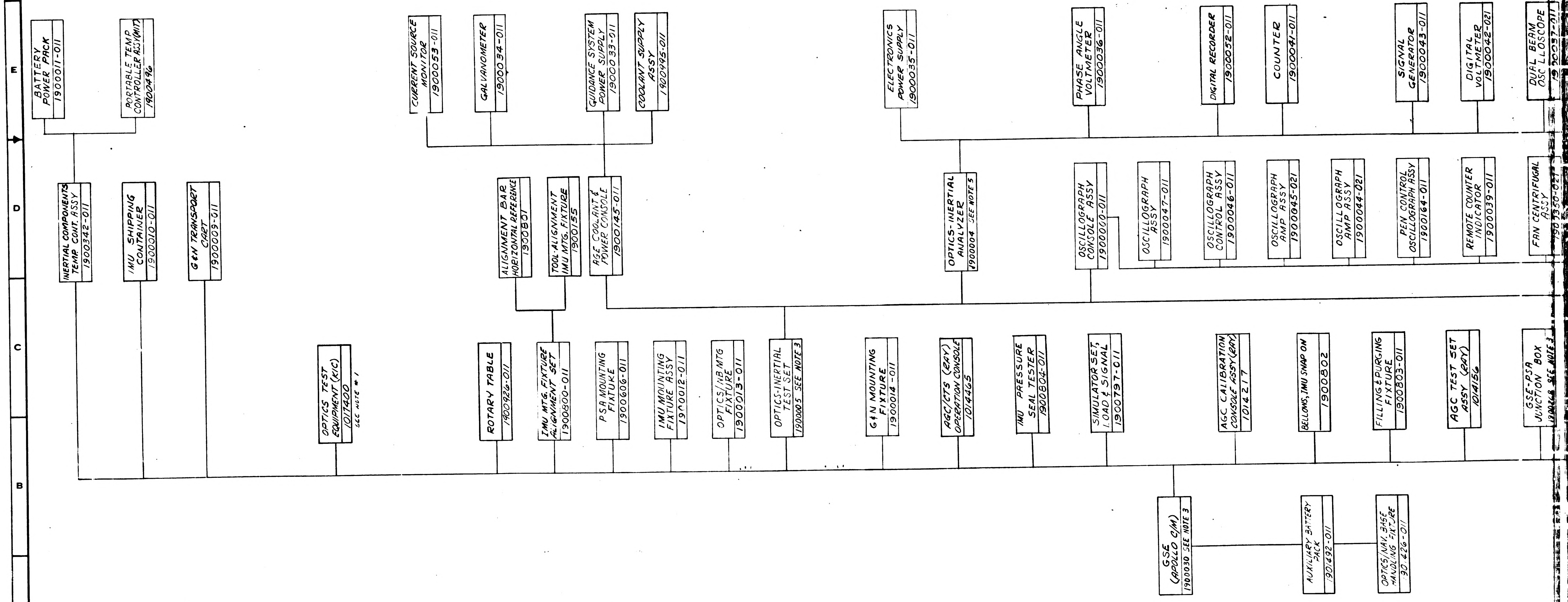
MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

GSE APOLLO
FAMILY TREE DRAWING

CODE IDENT NO
SIZE J
1900019
SCALE
SHEET

AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION
MILWAUKEE, WISCONSIN

1900019

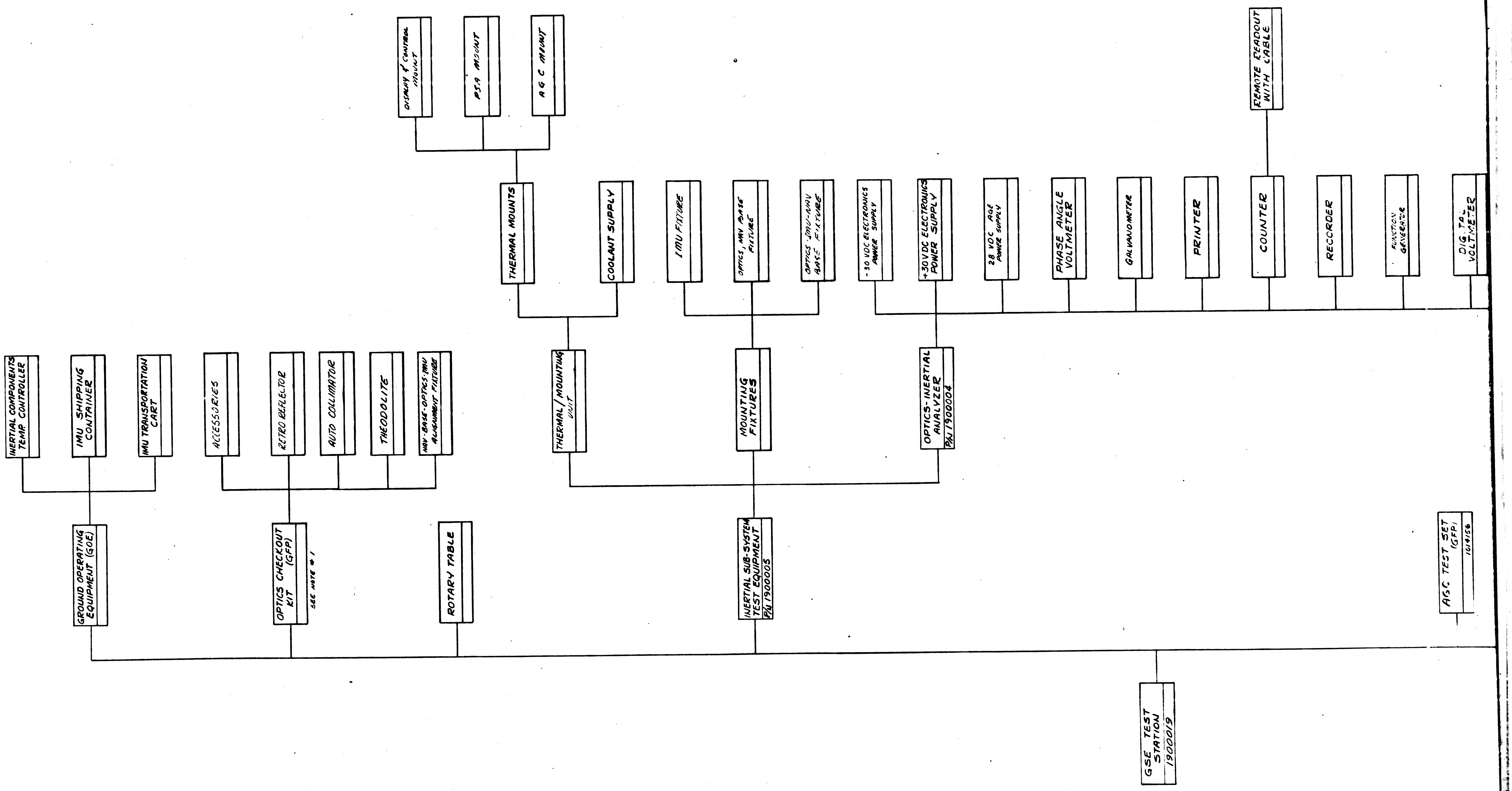

BATTERY POWER PACK 1900011-011
PORTABLE TEMP CONTROLLER ASSY(MIT) 1900496
CURRENT SOURCE MONITOR 1900053-011
GALVANOMETER 1900034-011
GUIDANCE SYSTEM POWER SUPPLY 1900033-011
COOLANT SUPPLY ASSY 1900995-011
ELECTRONICS POWER SUPPLY 1900035-011
PHASE ANGLE VOLTMETER 1900036-011
DIGITAL RECORDER 1900052-011
COUNTER 1900041-011
SIGNAL GENERATOR 1900043-011
DIGITAL VOLTMETER 1900042-021
DUAL BEAM OSC LLOSCOPE 1900037-011
INERTIAL COMPONENTS TEMP. CONT. ASSY 1900342-011
IMU SHIPPING CONTAINER 1900010-011
G&N TRANSPORT CART 1900009-011
ALIGNMENT BAR HORIZONTAL REFERENCE 1900801
TOOL ALIGNMENT IMU MTG. FIXTURE 1900155
AGE COOLANT & POWER CONSOLE 1900145-011
OPTICS-INERTIAL ANALYZER 1900004 SEE NOTE 5
OSCILLOGRAPH CONSOLE ASSY 1900000-011
OSCILLOGRAPH ASSY 1900047-011
OSCILLOGRAPH CONTROL ASSY 1900046-011
OSCILLOGRAPH AMP ASSY 1900045-021
OSCILLOGRAPH AMP ASSY 1900044-021
PEN CONTROL OSCILLOGRAPH ASSY 1900164-011
REMOTE COUNTER INDICATOR 1900039-011
FAN CENTRIFUGAL ASSY 1901350-021
OPTICS TEST EQUIPMENT (K/C) 1017400 SEE NOTE # 1
ROTARY TABLE 1900926-011
IMU MTG. FIXTURE ALIGNMENT SET 1900800-011
PSA MOUNTING FIXTURE 1900606-011
IMU MOUNTING FIXTURE ASSY 1900012-011
OPTICS/NB MTG FIXTURE 1900013-011
OPTICS-INERTIAL TEST SET 1900005 SEE NOTE 3
G&N MOUNTING FIXTURE 1900014-011
AGC/CTS (RAY) OPERATION CONSOLE 1014465
IMU PRESSURE SEAL TESTER 1900804-011
SIMULATOR SET, LOAD & SIGNAL 1900797-011
AGC CALIBRATION CONSOLE ASSY (RAY) 1014217
BELLOWS, IMU SNAP ON 1900802
FILLING & PURGING FIXTURE 1900803-011
AGC TEST SET ASSY (RAY) 1014156
GSE-PSA JUNCTION BOX 1900268 SEE NOTE 3
GSE (APOLLO C/M) 1900030 SEE NOTE 3
AUXILIARY BATTERY PACK 1901492-011
OPTICS/NAV. BASE HANDLING FIXTURE 1901426-011

1900019

17/1900019

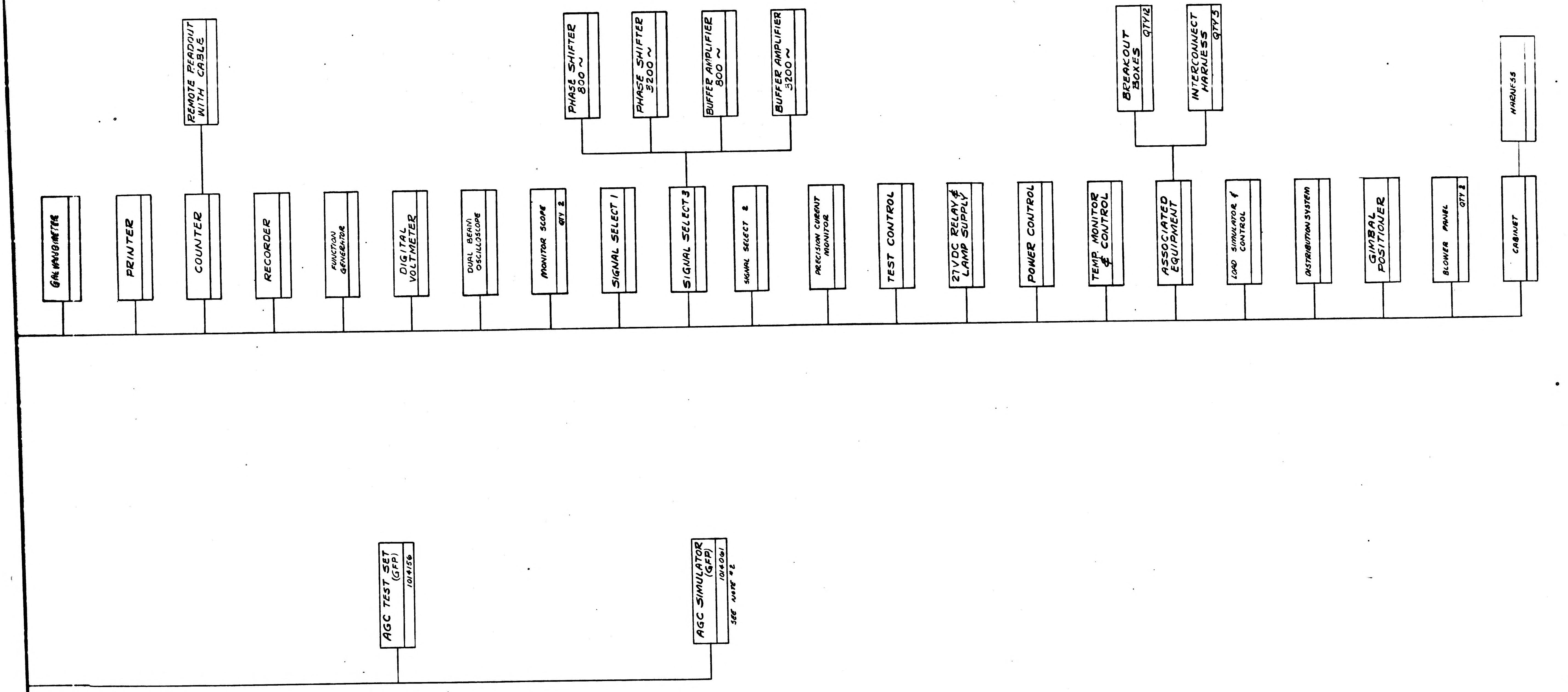
AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION
MILWAUKEE, WISCONSIN

1900019


DISPLAY & CONTROL MOUNT
PSA MOUNT
A G C MOUNT
REMOTE READOUT WITH CABLE
THERMAL MOUNTS
COOLANT SUPPLY
IMU FIXTURE
OPTICS, NAV BASE FIXTURE
OPTICS IMU-NAV BASE FIXTURE
-30 VDC ELECTRONICS POWER SUPPLY
+30VDC ELECTRONICS POWER SUPPLY
28 VDC AGE POWER SUPPLY
PHASE ANGLE VOLTMETER
GALVANOMETER
PRINTER
COUNTER
RECORDER
FUNCTION GENERATOR
DIGITAL VOLTMETER
INERTIAL COMPONENTS TEMP. CONTROLLER
IMU SHIPPING CONTAINER
IMU TRANSPORTATION CART
ACCESSORIES
RETRO REFLECTOR
AUTO COLLIMATOR
THEODOLITE
NAV-BASE-OPTICS-IMU ALIGNMENT FIXTURE
THERMAL/MOUNTING UNIT
MOUNTING FIXTURES
OPTICS-INERTIAL ANALYZER P/N 1900004
GROUND OPERATING EQUIPMENT (GOE)
OPTICS CHECKOUT KIT (GFP)
SEE NOTE # 1
ROTARY TABLE
INERTIAL SUB-SYSTEM TEST EQUIPMENT P/N 1900005
AGC TEST SET (GFP)
1014156
GSE TEST STATION 1900019

1900019

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO



REMOTE READOUT WITH CABLE
PHASE SHIFTER 800 ~
PHASE SHIFTER 3200 ~
BUFFER AMPLIFIER 800 ~
BUFFER AMPLIFIER 3200 ~
BREAKOUT BOXES QTY 12
INTERCONNECT HARNESS QTY 3
HARNESS
GALVANOMETER
PRINTER
COUNTER
RECORDER
FUNCTION GENERATOR
DIGITAL VOLTMETER
DUAL BEAM OSCILLOSCOPE
MONITOR SCOPE QTY 2
SIGNAL SELECT 1
SIGNAL SELECT 3
SIGNAL SELECT 2
PRECISION CURENT MONITOR
TEST CONTROL
27VDC RELAY & LAMP SUPPLY
POWER CONTROL
TEMP. MONITOR & CONTROL
ASSOCIATED EQUIPMENT
LOAD SIMULATOR & CONTROL
DISTRIBUTION SYSTEM
GIMBAL POSITIONER
BLOWER PANEL QTY 2
CABINET
AGC TEST SET (GFP) 1014156
AGC SIMULATOR (GFP) 1014061 SEE NOTE #2

NOTES

1. QUANTITIES PER KIT VARIABLE DEPENDENT UPON KIT ALLOCATION.
2. WHEN REQUIRED AT THE PARTICULAR TEST STATION THIS UNIT MOUNTS WITHIN THE OPTICS - INERTIAL ANALYZER.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ___ DATE

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Euler DATE 21 FEB 63
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL 13 July 1963
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

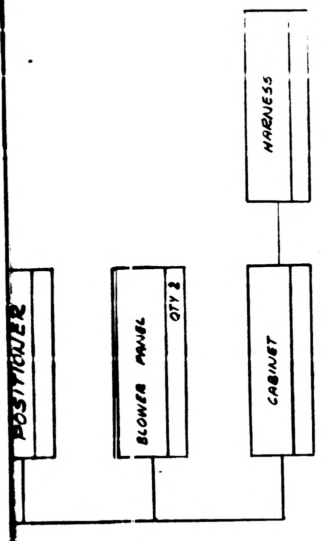
GSE [illegible]
FAMILY TREE

CODE IDENT NO. | SIZE | 1900
SCALE

1900019

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00553 DATE 13 MAR 1963

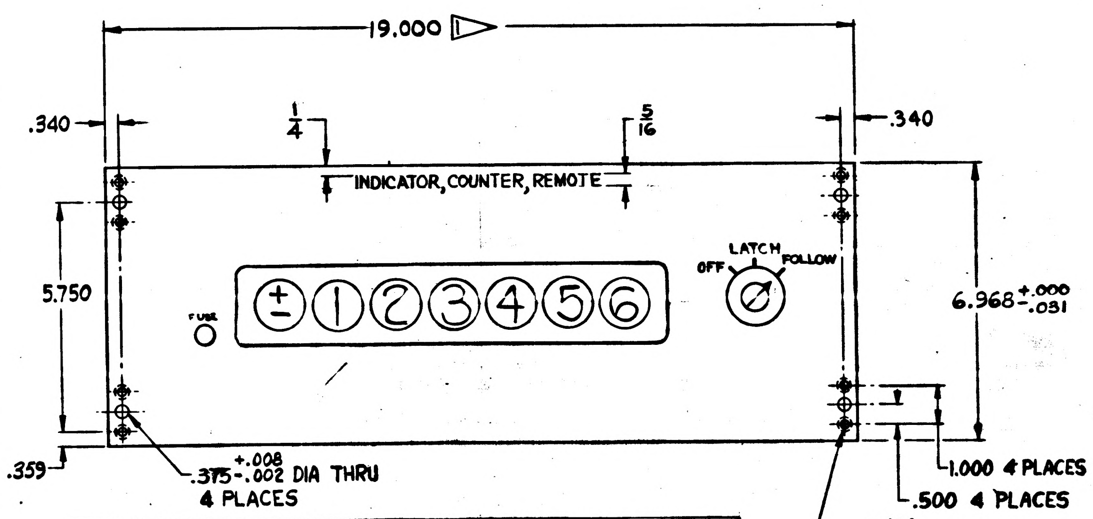
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES + + + − − −	AC SPARK PLUG DIVISION. GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN Eider DATE 21 FEB 63 CHECKED APPROVAL APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS GSE APOLLO (AGE) FAMILY TREE DRAWING
DO NOT SCALE THIS DRAWING MATERIAL	NASA APPROVAL 13 March 63	CODE IDENT NO. SIZE J 1900019
CONTRACT	MIT APPROVAL 13 Mar 63	SCALE SHEET

AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION
MILWAUKEE, WISCONSIN
1900019

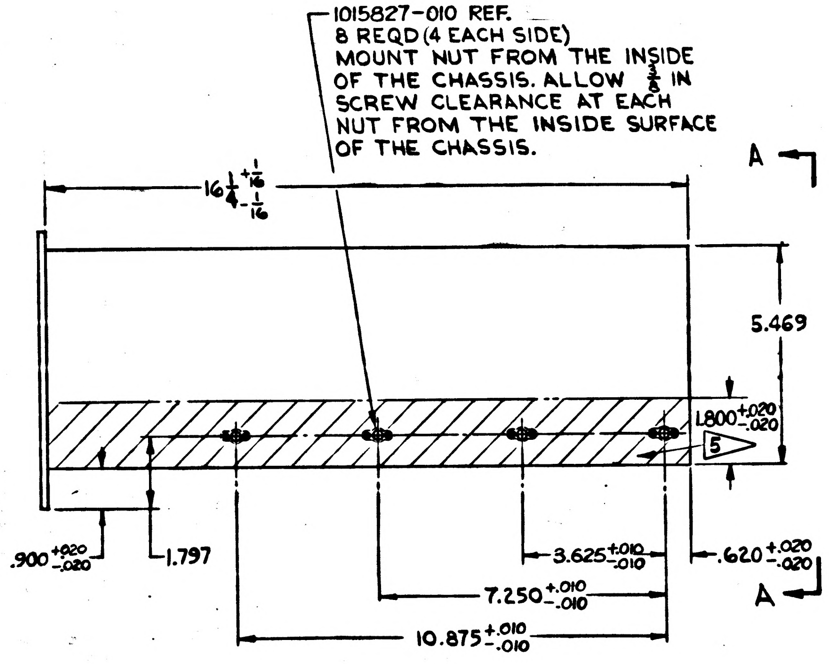
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS

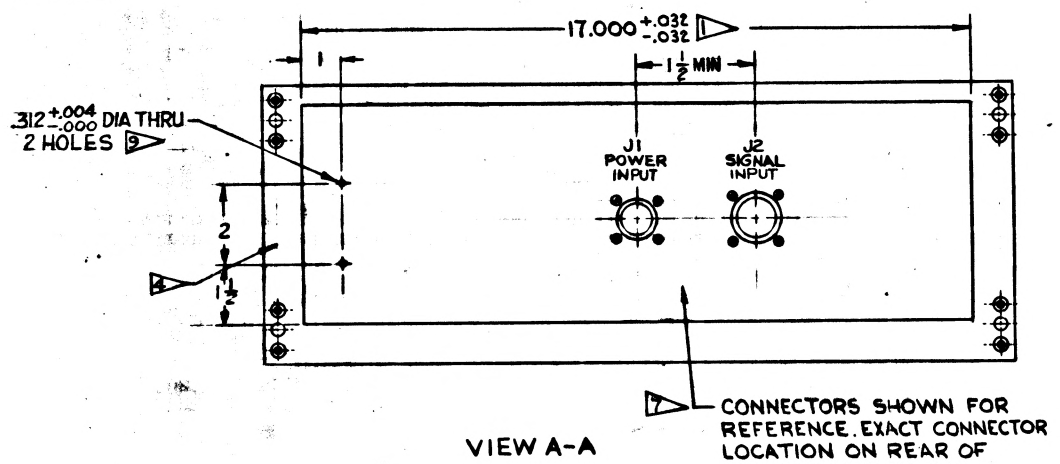
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		CHANGE IN ACCORDANCE WITH MXC (186620)		21 MAY 63	MTY / P.F.
A1		CHANGE IN ACCORDANCE WITH MXC 186873		10 JUN 63	4/EFS
B		CHANGE IN ACCORDANCE WITH MXC 187925 PER TDRR 04284		11 JUL 63	C.A.M. / CEP



19.000 1
.340
1/4
5/16
.340
INDICATOR, COUNTER, REMOTE
5.750
FUSE
± 1 2 3 4 5 6
LATCH
OFF
FOLLOW
6.968 +.000 -.031
.359
.375 +.008 -.002 DIA THRU 4 PLACES
1.000 4 PLACES
.500 4 PLACES
.203 +.006 -.002 DIA THRU 100° C'SINK TO .375 DIA ON REAR SURFACE OF FRONT PANEL 8 PLACES



1015827-010 REF.
8 REQD (4 EACH SIDE)
MOUNT NUT FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
A
16 1/4 +1/16 -1/16
5.469
1.800 +.020 -.020
5
.900 +.020 -.020
1.797
3.625 +.010 -.010
.620 +.020 -.020
7.250 +.010 -.010
10.875 +.010 -.010
A



17.000 +.032 -.032 1
1
1 1/2 MIN
.312 +.004 -.000 DIA THRU 2 HOLES 9
J1 POWER INPUT
J2 SIGNAL INPUT
2
1 1/2
4

VIEW A-A

7 CONNECTORS SHOWN FOR REFERENCE. EXACT CONNECTOR LOCATION ON REAR OF ASSEMBLY IS TO BE DETERMINED BY SUPPLIER

CONNECTOR IDENTIFICATION	CONNECTOR FUNCTION	PIN IDENTIFICATION	PIN USE
MS3112E-16-8P	J1 POWER INPUT	A	CHASSIS GROUND
		B	SPARE
		C	SPARE
		D	INPUT POWER HI
		E	INPUT POWER LO
		F, G, H	SPARES
MS 3112E-20-41P	J2 SIGNAL INPUT	A	SPARE
		B C D E	1 2 4 8 } BCD FOR INDICATOR DIGIT #1 OR LSD 6
		F, G	SPARES
		H J K L	1 2 4 8 } DIGIT #2
		M, N	SPARES
		P R S T	1 2 4 8 } DIGIT #3
		U V W X	1 2 4 8 } DIGIT #4
		Y, Z, a, b	SPARES
		c d e f	1 2 4 8 } DIGIT #5
		g h i j	1 2 4 8 } DIGIT #6
		k	SIGNAL GROUND 7
		m	CONTROL SIGNAL 8
		n	SIGN INDICATOR
		p̄, q, r, s, t	SPARES

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

B	B
A	A
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

							TO BE ASSIGNED	READOUT (MODEL 5926-T)
			011	EFFECTIVITY		ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900039		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44440
DRAWN DATE 27 FEB 63
CHECKED W. Diehl 3 APR 63
APPROVAL 3 APR 63
APPROVAL 3 APR 63
NASA APPROVAL
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, COUNTER, REMOTE

CODE IDENT NO.
SIZE D
1900020
SCALE —
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B | 1900020

		REVISIONS			
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		CHANGE IN ACCORDANCE WITH MXC 187925 PER TDRR 04284		11 JUL 63 30 OCT 6	C.A.M WK

REQUIREMENTS:

6 DIGITS OF DATA & A ± INDICATOR DIGIT.

DIGIT HEIGHT .61 APPROX, BULB DIA. 1 INCH APPROX.

POWER: 115 VOLTS AC ±10%, 60 ±5 CPS; APPROX 45 WATTS

OPERATING SPEED: 15 PRESENTATIONS PER SECOND, MIN.

INPUT SIGNALS: BINARY VOLTAGES FROM COUNTING INSTRUMENTS WITH 1-2-4-8 CODE.

READOUT: NIXIE TUBE IN-LINE

FRONT PANEL CONTROLS:

3 POSITION SWITCH

OFF:

LATCH: THE READOUT UNIT DISPLAYS THE COUNTER INDICATION AT THE END OF EACH COUNTING PERIOD AND HOLDS THIS DISPLAY UNTIL THE END OF THE NEXT COUNTING PERIOD.

FOLLOW: THE READOUT UNIT CONTINUOUSLY SAMPLES THE CODED OUTPUT SIGNALS FROM THE COUNTER AND DISPLAYS THE COUNT REGISTERED AT THE TIME OF EACH SAMPLING.

ASSOCIATED EQUIPMENT: THE INDICATOR SHALL FOLLOW THE CODED COMMANDS OF COUNTER PER 1900032 WHEN THE COUNTER IS DRIVING THE INDICATOR AND PRINTER 1900063 SIMULTANEOUSLY.

WEIGHT: 35 LBS. APPROX.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND 1002019. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

3▷ FRONT PANEL FINISH - APPLY FINISH P513 OF SPEC MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529 A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595.

CHARACTERS PER ND-1002122
CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157.
CENTRALIZE AS SHOWN.

1▷ 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED AT ASSEMBLY WITHIN .020. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.

REQUIREMENTS (CONTINUED):

TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO, ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED.

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP-1900020.

FRONT PANEL MATERIAL: $\frac{3}{16}$ ALUMINUM (5052-H32) QQ-A-318 TEMP. H-32

KNOBS SHALL BE PER MS91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK.

4▷ BORDER AREA, WITHIN $\frac{3}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANER AND FREE OF PROTUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

5▷ THERE SHALL BE NO PROTUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATION HOLES WILL BE EFFECTIVE IN THIS AREA. THE SIDE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE READOUT

6▷ BINARY "0" = -11.5 V TO -15 V
BINARY "1" = -0.5 TO + 15 V

7▷ CONTROL SIGNAL IS A DC CHANGE FROM BINARY "1" TO BINARY "0" AND IS AVAILABLE WHEN COUNT GATE OF THE COUNTER CLOSES. BINARY "0" = -11.5 V TO -15 V, BINARY "1" = -0.5 V TO +15 V.

8▷ BINARY "0" = PLUS SIGN = -11.5 V TO -15 V.
BINARY "1" = MINUS SIGN = -0.5 V TO +15 V.

SIGNAL INPUT, POWER SOURCE & CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

DATA SOURCE:

SYSTRON-DONNER IN-LINE READOUT MODEL 1500-25

9▷ ALLOW $\frac{1}{2}$ INCH CLEARANCE BEHIND EACH HOLE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

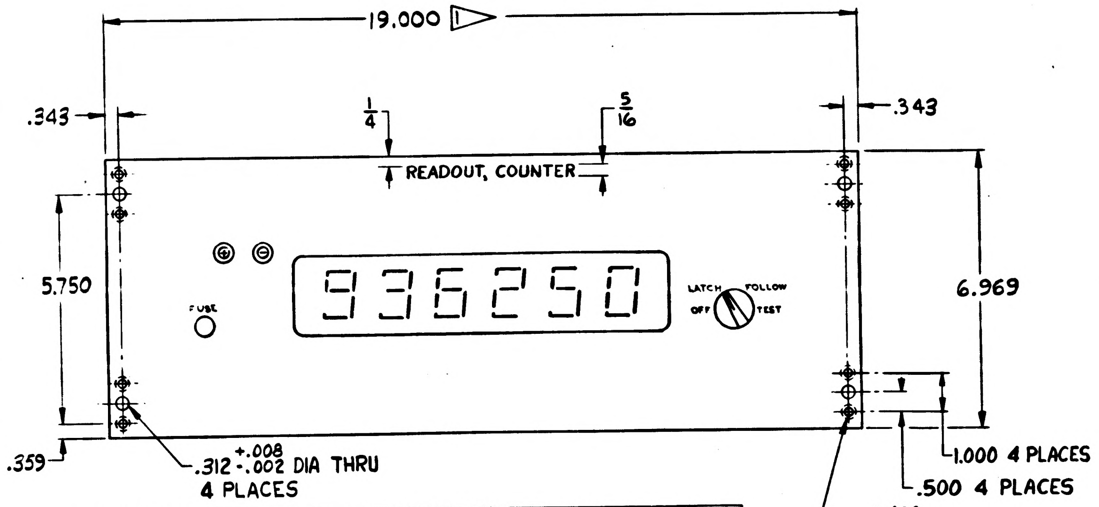
1900039		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS $+\frac{1}{64}$ $-\frac{1}{64}$ DECIMALS +.005 -.005 ANGLES +2° -2° DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN SK44440 DRAWN R. W. Haisel DATE 27 FEB 63 CHECKED W. Diell 3 APR 63 APPROVAL 3 APR 63 APPROVAL 3 APR 63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	INDICATOR, COUNTER, REMOTE
NEXT ASSY	USED ON	MATERIAL	NASA APPROVAL 4/24/63 J P Gilmore 4-24-63	CODE IDENT NO.	SIZE D 1900020
APPLICATION		CONTRACT	MIT APPROVAL 24 Apr 63	SCALE —	SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

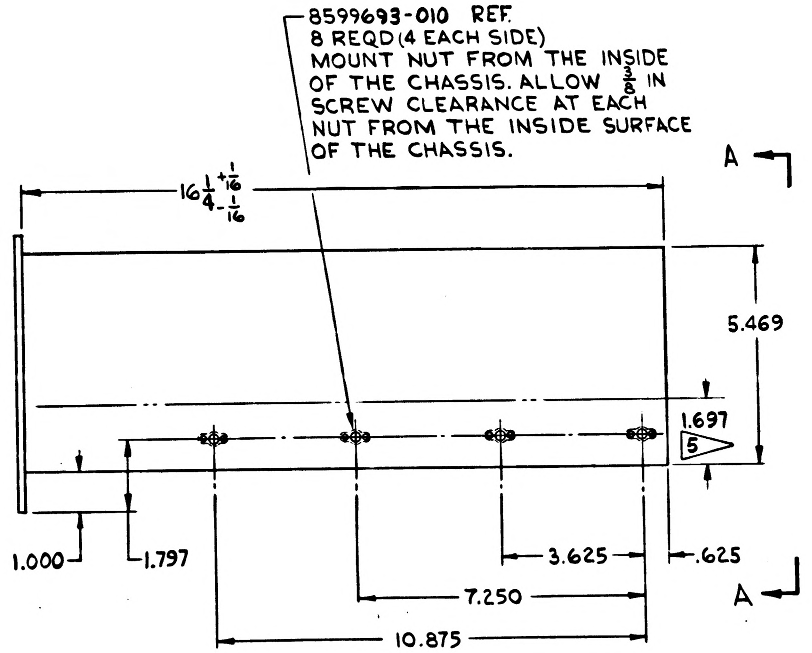
0200061

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD

REVISIONS

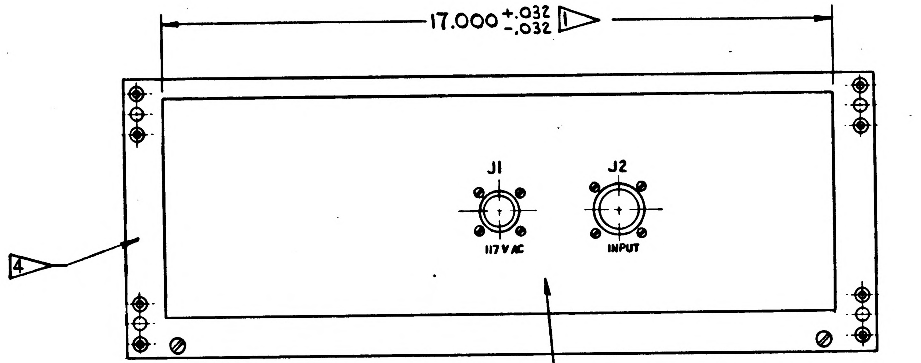

19.000 1
.343
.343
1/4
5/16
READOUT, COUNTER
936250
FUSE
LATCH
FOLLOW
OFF
TEST
5.750
6.969
.359
.312 +.008 -.002 DIA THRU
4 PLACES
1.000 4 PLACES
.500 4 PLACES

.188 +.006 -.002 DIA THRU
100° C'SINK TO .375 DIA
ON REAR SURFACE OF
FRONT PANEL
8 PLACES


16 1/4 +1/16 -1/16
A
A
5.469
1.697
5
1.000
1.797
3.625
.625
7.250
10.875

8599693-010 REF.
8 REQD (4 EACH SIDE)
MOUNT NUT FROM THE INSIDE
OF THE CHASSIS. ALLOW 3/8 IN
SCREW CLEARANCE AT EACH
NUT FROM THE INSIDE SURFACE
OF THE CHASSIS.

CONNECTOR IDENTIFICATION	CONNECTOR FUNCTION	PIN IDENTIFICATION	PIN USE
MS3112E-16-8P	J1 POWER INPUT	A	CHASSIS GROUND
		B	SPARE
		C	SPARE
		D	INPUT POWER HI
		E	INPUT POWER LO
		F, G, H	SPARES
MS 3112E-20-41P	J2 SIGNAL INPUT	A	SPARE
		B C D E	1 2 4 8 } BCD FOR INDICATOR DIGIT #1 OR LSD 6
		F, G	SPARES
		H J K L	1 2 4 8 } DIGIT #2
		M, N	SPARES
		P R S T	1 2 4 8 } DIGIT #3
		U V W X	1 2 4 8 } DIGIT #4
		Y, Z, a, b	SPARES
		c̄ d e f	1 2 4 8 } DIGIT #5
		g h i j	1 2 4 8 } DIGIT #6
		k	SIGNAL GROUND 7
		m	CONTROL SIGNAL 8
		n	SIGN INDICATOR
		p̄, q, r, s̄, t	SPARES


17.000 +.032 -.032 1
J1
J2
117 VAC
INPUT
4

7 CONNECTORS SHOWN FOR REFERENCE. EXACT CONNECTOR LOCATION ON REAR OF ASSEMBLY IS TO BE DETERMINED BY SUPPLIER

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24Apr63

	TO BE ASSIGNED	READOUT (MODEL 5926-T)
011 EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED		LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900039		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44440
DRAWN R.W. [illegible] DATE 27 FEB 63
CHECKED W. Diehl 3 APR 63
APPROVAL [illegible] 3 APR 63
APPROVAL [illegible] 3 APR 63
NASA APPROVAL [illegible]
P. Gilmore 4-24-63
MIT APPROVAL [illegible] for 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

READOUT, COUNTER

CODE IDENT NO. SIZE D 1900020
SCALE —
SHEET 1 OF 2

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900020

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

REQUIREMENTS:

NUMBER OF DIGIT PLACES: 6

SIGN INDICATOR LIGHTS: 2

DIGIT SIZE: $\frac{3}{4} \times 1\frac{1}{4}$ APPROX.

POWER: 115 VOLTS AC ±10%, 60 CPS; APPROX 45 WATTS

OPERATING SPEED: 15 PRESENTATIONS PER SECOND, MIN.

INPUT SIGNALS: BINARY VOLTAGES FROM COUNTING INSTRUMENTS WITH 1-2-4-8 CODE.

READOUT: NIXIE TUBE IN-LINE

FRONT PANEL CONTROLS:

4 POSITION SWITCH

OFF:

LATCH: THE READOUT UNIT DISPLAYS THE COUNTER INDICATION AT THE END OF EACH COUNTING PERIOD AND HOLDS THIS DISPLAY UNTIL THE END OF THE NEXT COUNTING PERIOD.

FOLLOW: THE READOUT UNIT CONTINUOUSLY SAMPLES THE CODED OUTPUT SIGNALS FROM THE COUNTER AND DISPLAYS THE COUNT REGISTERED AT THE TIME OF EACH SAMPLING.

TEST: A SET OF INTERNAL SIGNALS ILLUMINATES ALL DISPLAY ELEMENTS IN EACH DIGIT POSITION.

ASSOCIATED EQUIPMENT: THE READ-OUT MUST FOLLOW THE CODED COMMANDS OF COUNTER PER 1900032.

WEIGHT: 35 LBS APPROX.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

1▷ 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED AT ASSEMBLY WITHIN .010.

3▷ FRONT PANEL FINISH-APPLY FINISH P513 OF SPEC MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529 A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595.

REAR FACE OF FRONT PANEL TO BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

CHARACTERS-FUTURA DEMIBOLD.
CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157.
CENTRALIZE AS SHOWN.

REQUIREMENTS (CONTINUED):

TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO, ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED.

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ES- .

FRONT PANEL MATERIAL: $\frac{3}{16}$ ALUMINUM (5052-H32)
QQ-A-318 TEMP. H-32

KNOBS SHALL BE PER MS91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK.

4▷ BORDER AREA, WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANER AND FREE OF PROTUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

5▷ THERE SHALL BE NO PROTUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATION HOLES WILL BE EFFECTIVE IN THIS AREA. THE SIDE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE READOUT

6▷ BINARY "0" = -12 V TO -50V
BINARY "1" = 0V TO +50V

7▷ CONTROL SIGNAL IS A DC CHANGE FROM BINARY "1" TO BINARY "0" AND IS AVAILABLE WHEN COUNT GATE OF THE COUNTER CLOSES.

8▷ BINARY "0" = PLUS SIGN
BINARY "1" = MINUS SIGN

INPUT, POWER SOURCE AND CHASSIS MUST BE ELECTRICALLY ISOLATED FROM EACH OTHER AND FROM THE FRAME.

THE EQUIPMENT SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF

DATA SOURCE:
BECKMAN IN-LINE READOUT MODEL NO. 5926 WITH MODIFICATION T.

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

1900039	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+2°
$-\frac{1}{64}$	-.005	-2°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44440
DRAWN R.W. Heisel DATE 27 FEB 63
CHECKED W. Riell 3 APR 63
APPROVAL 3 APR 63
APPROVAL A. Fridel 3 APR 63
NASA APPROVAL 4/24/63
J.P. Helmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

READOUT, COUNTER

CODE IDENT NO.
SIZE D
1900020
SCALE —
SHEET 2 OF 2

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REQUIREMENTS:

DC OUTPUT:

VOLTAGE ADJUSTABLE RANGE: 23-33 VDC AT REMOTE SENSING POINT WITH AN OUTPUT LINE DROP OF 0 TO 3V.

CURRENT OUTPUT RANGE: 0-50 AMPS.

REGULATION:

LINE: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE OF AC LINE VOLTAGE FROM 105 TO 125 VOLTS WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

LOAD: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE IN LOAD FROM ZERO TO 50 AMPERES WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

STABILITY: OUTPUT SHALL VARY LESS THAN 28 MILLIVOLTS FOR 8 HOURS AFTER WARMUP UNDER FIXED LINE, LOAD, AND TEMPERATURE CONDITIONS.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENSE.

RECOVERY TIME TO OUTPUT REGULATION FOR A CHANGE FROM NO LOAD TO FULL LOAD: 100 MICROSECONDS MAX.

OVERSHOOT BEYOND REGULATED OUTPUT FOR A CHANGE FROM NO LOAD TO FULL LOAD: 2V. MAX.

TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 2% OR .5 VOLTS, WHICHEVER IS LARGER.

TEMPERATURE COEFFICIENT: LESS THAN 0.05% PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE, OR NEGATIVE.

PROGRAMMING-REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE: PROGRAMMING CONSTANT- 50 OHMS PER VOLT OF OUTPUT, MINIMUM 3 WATT RATING OF PROGRAMMING RESISTOR (REF).

REMOTE SENSING: VOLTAGE REGULATION MAINTAINED AT THE LOAD.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VERNIER VOLTAGE ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10MV.

CIRCUIT PROTECTION-LOAD: CURRENT LIMITING CONTINUOUSLY ADJUSTABLE FROM 300 MILLIAMPS TO RATED OUTPUT CURRENT.

OUTPUT IMPEDENCE: .008 OHMS MAX. FROM DC TO 1KC..08 OHMS MAX. FROM 1KC TO 10KC, AND .8 OHMS MAX. FROM 10KC TO 100KC WHEN MEASURED AT POWER SUPPLY OUTPUT TERMINALS.

THERMAL OVERLOAD PROTECTION: REQUIRED.

AC INPUT: VOLTAGE; 105-125 V. AC
FREQUENCY; 55-65 CPS
PHASE; SINGLE

TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING, AND REMOTE VOLTAGE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.

FRONT PANEL HARDWARE: INPUT CIRCUIT BREAKER, PILOT LIGHT.

FORCED AIR COOLING: DIRECTION AS SHOWN.

WEIGHT: MUST NOT EXCEED 130 LBS.

1▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME & FINISH COATS TO BE APPLIED TO PANEL FRONT & EDGES ONLY. APPLY 2 COATS OF TT-E-529A, CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED-STD-595.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP-1900021, POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

2▷ MOUNT NUT 1015798-010 FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

4▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SHADED AREA. (BOTH OUTER SIDES). THE CHASSIS SHALL BE STRONG ENOUGH IN THIS AREA TO SUPPORT THE UNIT WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

6▷ CHARACTERS, (PER ND 1002122,) CHARACTER HEIGHT 1/8 EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

7▷ BORDER AREA WITHIN 9/16 IN. OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANOR AND FREE FROM PROTRUSIONS.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL PER ND 1002019.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

NON-FRONT PANEL CONTROLS: THE CURRENT LIMIT ADJUSTMENT CONTROL & VOLTAGE VERNIER & VOLTAGE ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY (WITH TOP COVER REMOVED). IT SHALL BE A SCREWDRIVER ADJUSTMENT WITH LOCKING DEVICE. EXACT LOCATION OF ADJUSTMENT CONTROL TO BE DETERMINED BY SUPPLIER.

5▷ THE 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020; CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH IN SHADED AREA DEFINED ON SIDE VIEW OF POWER SUPPLY.

OVERVOLTAGE PROTECTION: VOLTAGE AUTOMATICALLY LIMITED FROM RISING ABOVE 38V WHEN MEASURED AT POWER SUPPLY OUTPUT TERMINALS FOR ANY CONDITIONS INCLUDING OPEN REMOTE SENSING LEADS AND/OR OPEN REMOTE PROGRAMMING LEADS. PROVISION SHALL ALSO BE MADE TO PROTECT THE POWER SUPPLY FROM DAMAGE IF OUTPUT POWER LEADS, SENSING LEADS, OR PROGRAMMING LEADS ARE OPENED.

8▷ APPLY PER ND 1002019

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

PIN LIST

CONN. PART NO.	PIN LTR	PIN CONNECTION
10▷ MS3102E-24-22-P	A	CHASSIS GRD
↓	B	OPEN
	C	115 V. AC HI
	D	115 V. AC LO
11▷ MS3102E-24-12S	A	OUTPUT HI
↓	B	OPEN
	C	OUTPUT LO
	D	OPEN
	E	OPEN

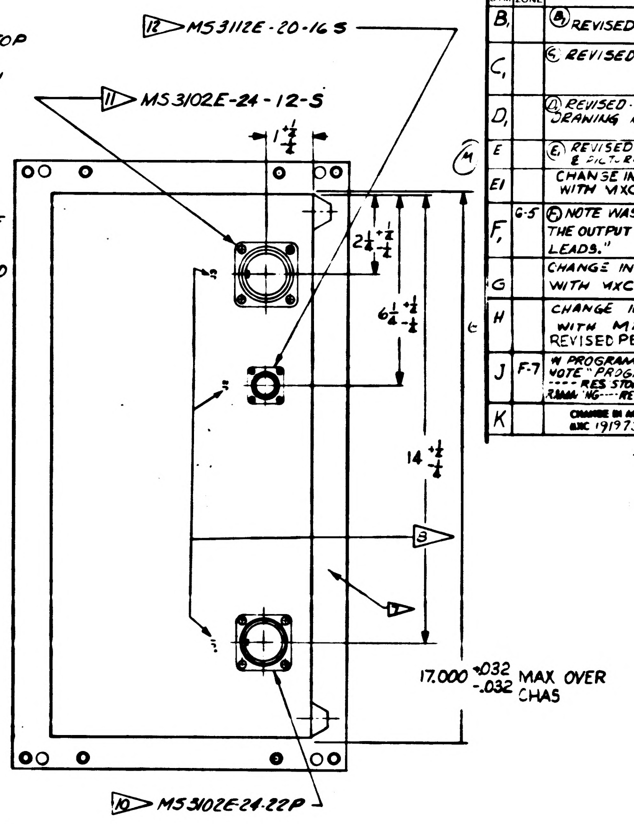
PIN LIST FOR 12▷ CONN. PART NO. MS3112E-20-16S, EXTERNAL CONNECTIONS

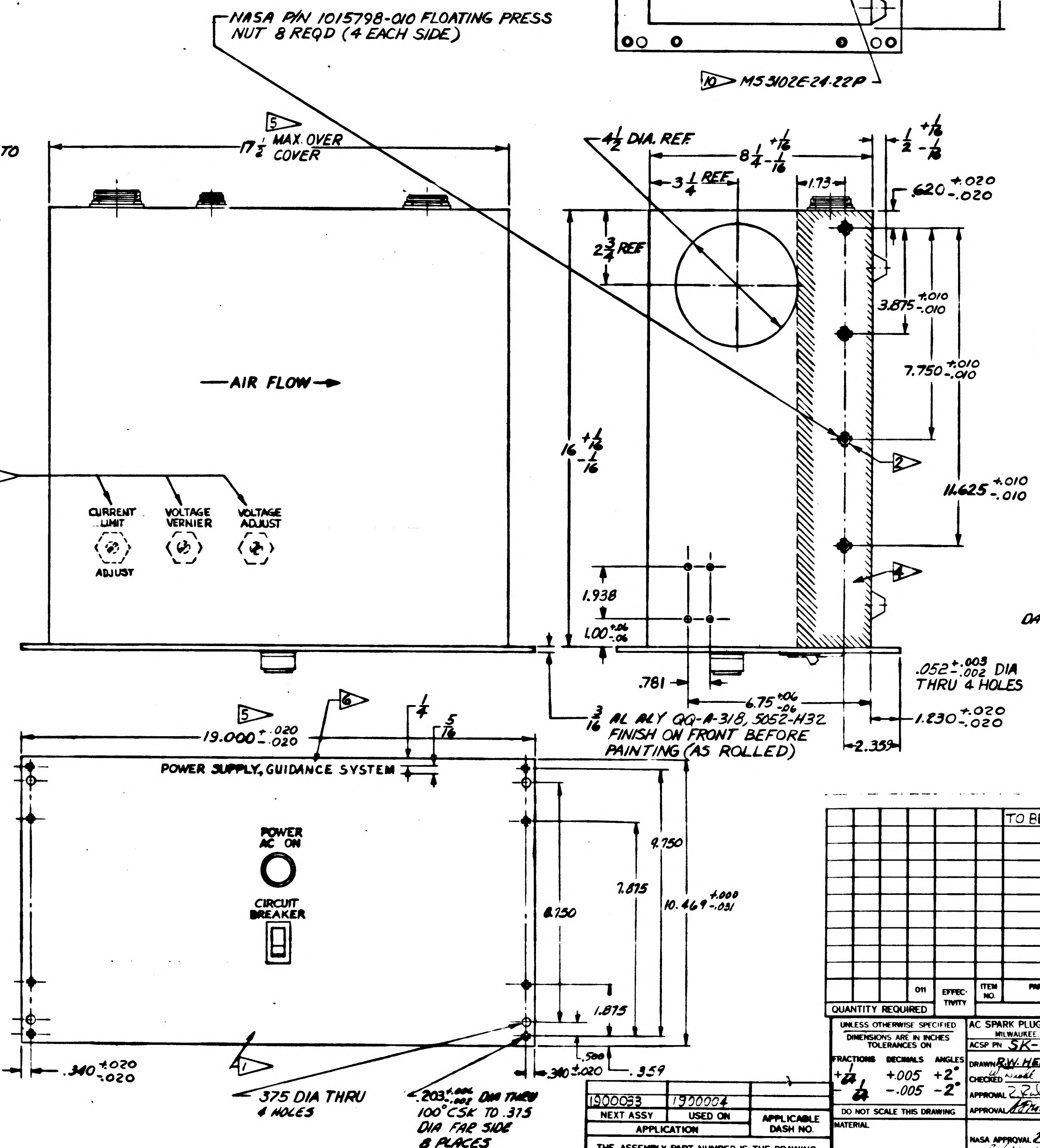
FOR LOCAL VOLTAGE ADJUSTING & SENSING		FOR REMOTE VOLTAGE ADJUSTMENT AND REMOTE SENSING	
PIN LTR	PIN CONNECTION	PIN LTR	PIN CONNECTION
A	CHASSIS GRD	A	← CHASSIS GRD
B	←	B	OPEN
C	←	C	←
D	←	D	←
E	←	E	←
F	OPEN	F	←
G	←	G	←
H	←	H	OPEN
J	OPEN	J	↓
K	↓	K	
L		L	
M		M	
N		N	
P		P	
R		R	
S		S	

REMOTE VOLTAGE ADJUSTMENT

LOAD

TWISTED SHIELDED PAIR





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00499 DATE 24 Apr 63

DATA SOURCE:
TRYGON ELECTRONICS INC
ROOSEVELT, L.I. N.Y.
MODEL C-36-50 (OV)

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B,		Ⓑ REVISED & REDRAWN	D.O. 51303	3 FEB 63	[illegible]
C,		Ⓒ REVISED	D.O. 51323	19-FEB-63	A.J.F.
D,		Ⓓ REVISED-ADDED NASA DRAWING NUMBER	D.O. 51408	-APR-63	A.J.F. WK
E		Ⓔ REVISED REQUIREMENTS & PICTURE	D.O. 51438	APR 63	EM J.M.
E1		CHANGE IN ACCORDANCE WITH MXC 87144		18 JUN 63	[illegible]
F,	G-5	Ⓕ NOTE WAS OVERVOLTAGE... THE OUTPUT TERMINALS... LEADS."	MXC 187892	12 JUL 63	WSM M
G		CHANGE IN ACCORDANCE WITH MXC 88465.		5 AUG 63	A.W.D. RBW
H		CHANGE IN ACCORDANCE WITH MXC 189484 REVISED PER TDRR 03411		5 SEP 63	JGL
J	F-7	IN PROGRAMMING PARAGRAPH NOTE "PROGRAMMING-REMOTE ---- RESISTOR (REF), WAS "PROGRAMMING---- RES." PER MXC 89982		17 OCT 63	A.M.M. EP
K		CHANGE IN ACCORDANCE WITH MXC 191973 PER TDRR 08091		13 NOV 63	WSM M

						TO BE ASSIGNED	POWER SUPPLY (MODEL C-36-50)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900033	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64 DECIMALS +.005 -.005 ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44259
DRAWN R.W. HEISEL DATE 4 OCT 62
CHECKED W. Nickel 3 APR 63
APPROVAL Z. Rahn Apr 3, 1963
APPROVAL A. Friedel 3 APR 63
NASA APPROVAL [illegible] 4-24-63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY GUIDANCE SYSTEM

CODE IDENT NO.
SIZE E
1900021
SCALE —
SHEET

1900021 K

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B,		(B,) REVISED & REDRAWN	DC5 303	3 FEB 63	
C,		(C,) REVISED	D.O. 5.323	FEB 63	A.J.F.
D,		(D,) REVISED - ADDED NASA DRAWING NUMBER	D.O. 5 408	FEB 63	A.J.F.
E,		(E,) REVISED REQUIREMENTS & PICTURE	D.O. 5 432	3 APR 63	EN

REQUIREMENTS:

DC OUTPUT:

VOLTAGE ADJUSTABLE RANGE: 23-33 VDC AT REMOTE SENSING POINT WITH AN OUTPUT LINE DROP OF 0 TO 3V.

CURRENT OUTPUT RANGE: 0-50 AMPS.

REGULATION:

LINE: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE OF AC LINE VOLTAGE FROM 105 TO 125 VOLTS WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

LOAD: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE IN LOAD FROM ZERO TO 50 AMPERES WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

STABILITY: OUTPUT SHALL VARY LESS THAN 28 MILLIVOLTS FOR 8 HOURS AFTER WARMUP UNDER FIXED LINE, LOAD, AND TEMPERATURE CONDITIONS.

OUTPUT IMPEDENCE: .008 OHMS MAX. FROM DC TO 1 KC AND .8 OHMS MAX. FROM 1 KC TO 100KC.

RECOVERY TIME TO OUTPUT REGULATION FOR A CHANGE FROM NO LOAD TO FULL LOAD: 100 MICROSECONDS MAX.

OVERSHOOT BEYOND REGULATED OUTPUT FOR A CHANGE FROM NO LOAD TO FULL LOAD: 2V. MAX.

TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 2% OR .5 VOLTS, WHICHEVER IS LARGER.

TEMPERATURE COEFFICIENT: LESS THAN 0.05% PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE, OR NEGATIVE.

PROGRAMMING, REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE: PROGRAMMING CONSTANT - 50 OHMS PER VOLT OF OUTPUT, MINIMUM 3 WATT RATING OF PROGRAMMING RESISTOR.

REMOTE SENSING: VOLTAGE REGULATION MAINTAINED AT THE LOAD.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VERNIER VOLTAGE ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10MV.

CIRCUIT PROTECTION - LOAD: CURRENT LIMITING CONTINUOUSLY ADJUSTABLE FROM 300 MILLIAMPS TO RATED OUTPUT CURRENT.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENSE.

THERMAL OVERLOAD PROTECTION: REQUIRED.

AC INPUT:
VOLTAGE: 105-125 V. AC
FREQUENCY; 50-65 CPS
PHASE; SINGLE

TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING, AND REMOTE VOLTAGE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.

FRONT PANEL HARDWARE: INPUT CIRCUIT BREAKER, PILOT LIGHT.

FORCED AIR COOLING: DIRECTION AS SHOWN.

WEIGHT: MUST NOT EXCEED 130 LBS.

1▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME & FINISH COATS TO BE APPLIED TO PANEL FRONT & EDGES ONLY. APPLY 2 COATS OF TT-E-529A, CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED-STD-595.

THE POWER SUPPLY SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF (ES-)ND-

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN (ES-)ND-

POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

2▷ MOUNT NUT 1015798-010 FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

4▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SHADED AREA. (BOTH OUTER SIDES). THE CHASSIS SHALL BE STRONG ENOUGH IN THIS AREA TO SUPPORT THE UNIT WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

THE REAR FACE OF FRONT PANEL SHALL BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

6▷ CHARACTERS, (FUTURA DEMIBOLD) CHARACTER HEIGHT 1/8 EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

7▷ BORDER AREA WITHIN 9/16 IN. OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANOR AND FREE FROM PROTRUSIONS.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

8▷ DECIMAL TOLERANCES AS FOLLOWS: TWO PLACE $.00^{+.02}_{-.02}$; THREE PLACE $.000^{+.005}_{-.005}$

9▷ EXACT CONNECTOR LOCATION ON REAR OF POWER SUPPLY TO BE DETERMINED BY SUPPLIER.

NON-FRONT PANEL CONTROLS: THE CURRENT LIMIT ADJUSTMENT CONTROL & VOLTAGE VERNIER & VOLTAGE ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY (WITH TOP COVER REMOVED). IT SHALL BE A SCREWDRIVER ADJUSTMENT WITH LOCKING DEVICE AND MARKED BY ANY LEGIBLE METHOD. EXACT LOCATION OF ADJUSTMENT CONTROL TO BE DETERMINED BY SUPPLIER.

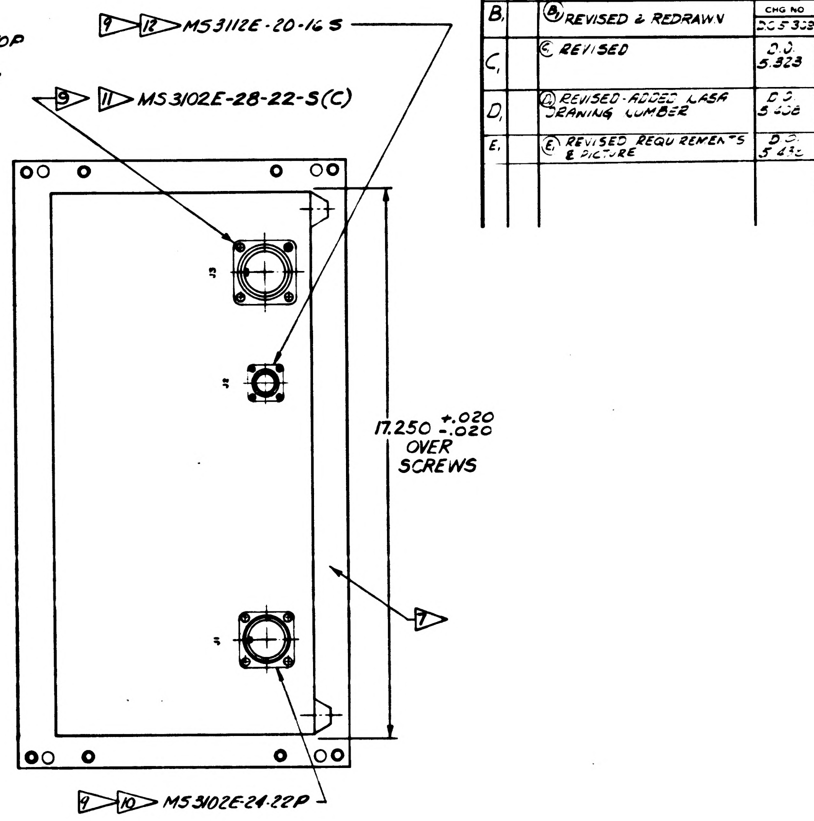
5▷ 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED TO WITHIN .020 AT ASSEMBLY. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.

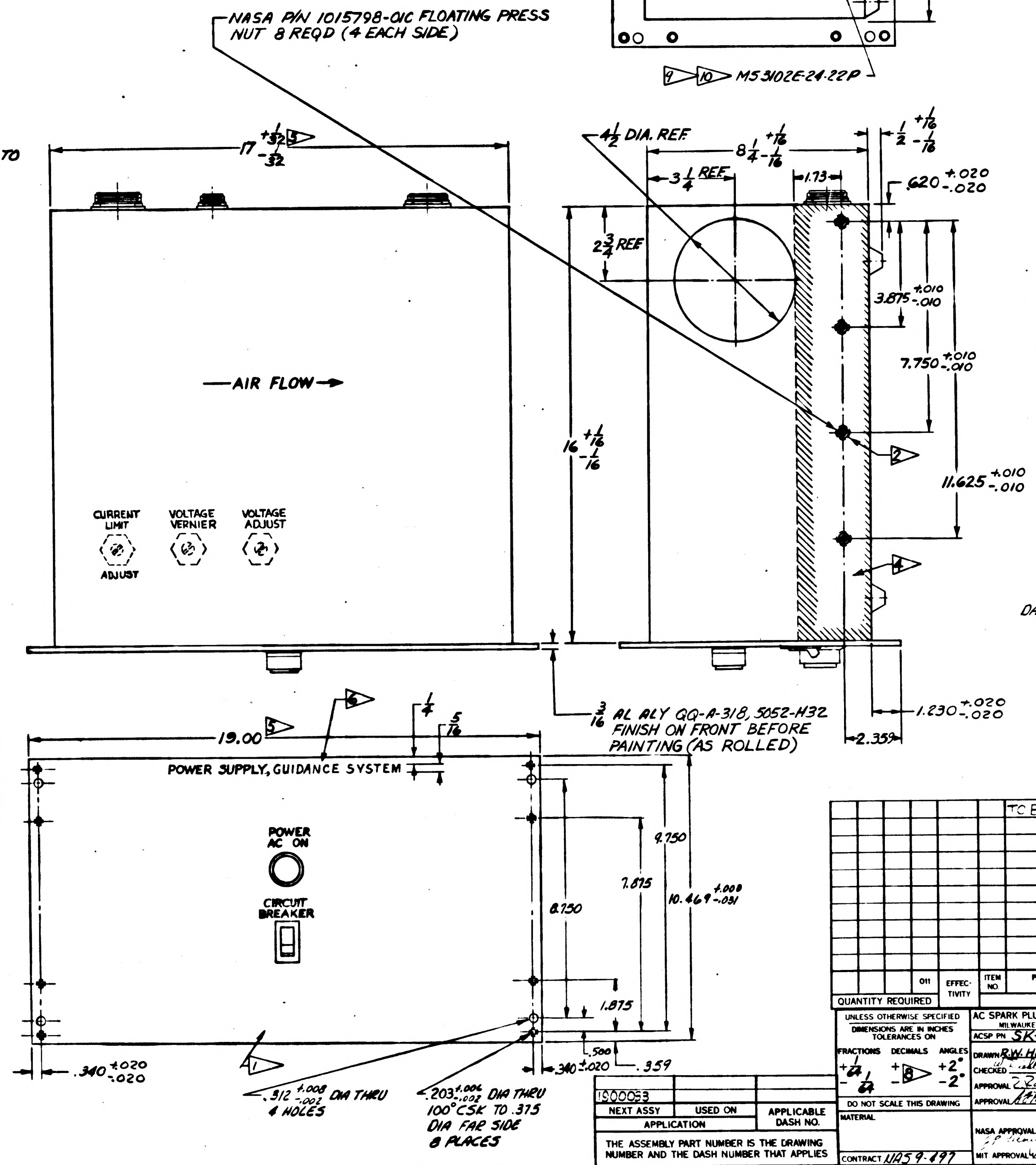
OVERVOLTAGE PROTECTION: VOLTAGE AUTOMATICALLY LIMITED FROM RISING 2V ABOVE OPERATING VOLTAGE SETTING WHEN MEASURED AT THE REMOTE SENSING LEADS. PROVISION SHALL ALSO BE MADE TO LIMIT THE OUTPUT VOLTAGE AT POWER SUPPLY SENSING TERMINALS TO 33V ±1% IF THE REMOTE SENSING LEADS OR REMOTE PROGRAMMING LEADS ARE OPENED.

PIN LIST		
CONN. PART NO.	PIN LTR	PIN CONNECTION
10▷ MS3102E-24-22-P	A	CHASSIS GRD
	B	OPEN
	C	115 V. AC HI
	D	115 V. AC LO
11▷ MS3102E-28-22-S(C)	A	OPEN
	B	OUTPUT HI
	C	OUTPUT LO
	D	OPEN
	E	OPEN
	F	OPEN

PIN LIST FOR 12▷ CONN. PART NO. MS3112E-20-16S, EXTERNAL CONNECTIONS

FOR LOCAL VOLTAGE ADJUSTING & SENSING		FOR REMOTE VOLTAGE ADJUSTMENT AND REMOTE SENSING		FOR REMOTE VOLTAGE SENSING	
PIN LTR	PIN CONNECTION	PIN LTR	PIN CONNECTION	PIN LTR	PIN CONNECTION
A	CHASSIS GRD	A	CHASSIS GRD		
B		B	OPEN		
C		C			
D		D			
E		E			
F	OPEN	F			
G		G			
H		H	OPEN		
J	OPEN	J			
K		K			
L		L			
M		M			
N		N			
P		P			
R		R			
S		S			





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00499 DATE 24Apr63

DATA SOURCE:
TRYGON ELECTRONICS INC
ROOSEVELT, L.I. N.Y.
MODEL C-36-50 (OV)

							TO BE ASSIGNED	POWER SUPPLY MODEL [illegible]
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS			

1900033		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +8▷ -
ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK-44259
DRAWN R.W. HEISEL DATE 4 OCT 62
CHECKED 3 APR '63
APPROVAL Apr 3, 1963
APPROVAL 3 APR 63
NASA APPROVAL 4-24-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

POWER SUPPLY GUIDANCE SYSTEM

CODE IDENT NO.
SIZE E
1900021
SCALE —
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REQUIREMENTS:

DC OUTPUT:

VOLTAGE ADJUSTABLE RANGE: 23-33 VDC AT REMOTE SENSING POINT WITH AN OUTPUT LINE DROP OF 0 TO 3V.

CURRENT OUTPUT RANGE: 0-50 AMPS.

REGULATION:

LINE: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE OF AC LINE VOLTAGE FROM 105 TO 125 VOLTS WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

LOAD: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE IN LOAD FROM ZERO TO 50 AMPERES WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.

STABILITY: OUTPUT SHALL VARY LESS THAN 28 MILLIVOLTS FOR 8 HOURS AFTER WARMUP UNDER FIXED LINE, LOAD, AND TEMPERATURE CONDITIONS.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENSE.

RECOVERY TIME TO OUTPUT REGULATION FOR A CHANGE FROM NO LOAD TO FULL LOAD: 100 MICROSECONDS MAX.

OVERSHOOT BEYOND REGULATED OUTPUT FOR A CHANGE FROM NO LOAD TO FULL LOAD: 2V. MAX.

TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 2% OR .5 VOLTS, WHICHEVER IS LARGER.

TEMPERATURE COEFFICIENT: LESS THAN 0.05% PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE, OR NEGATIVE.

PROGRAMMING, REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE: PROGRAMMING CONSTANT- 50 OHMS PER VOLT OF OUTPUT, MINIMUM 3 WATT RATING OF PROGRAMMING RESISTOR.

REMOTE SENSING: VOLTAGE REGULATION MAINTAINED AT THE LOAD.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VERNIER VOLTAGE ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.

CIRCUIT PROTECTION-LOAD: CURRENT LIMITING CONTINUOUSLY ADJUSTABLE FROM 300 MILLIAMPS TO RATED OUTPUT CURRENT.

OUTPUT IMPEDENCE: .008 OHMS MAX. FROM DC TO 1KC. .08 OHMS MAX. FROM 1KC TO 10KC, AND .8 OHMS MAX. FROM 10KC TO 100KC WHEN MEASURED AT POWER SUPPLY OUTPUT TERMINALS.

THERMAL OVERLOAD PROTECTION: REQUIRED.

AC INPUT: VOLTAGE; 105-125 V. AC
FREQUENCY; 55-65 CPS
PHASE; SINGLE

TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING, AND REMOTE VOLTAGE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.

FRONT PANEL HARDWARE: INPUT CIRCUIT BREAKER, PILOT LIGHT.

FORCED AIR COOLING: DIRECTION AS SHOWN.

WEIGHT: MUST NOT EXCEED 130 LBS.

1▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME & FINISH COATS TO BE APPLIED TO PANEL FRONT & EDGES ONLY. APPLY 2 COATS OF TT-E-529A, CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED-STD-595.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP-1900021, POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

2▷ MOUNT NUT 1015798-010 FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

4▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SHADED AREA. (BOTH OUTER SIDES). THE CHASSIS SHALL BE STRONG ENOUGH IN THIS AREA TO SUPPORT THE UNIT WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

6▷ CHARACTERS, (PER ND 1002122,) CHARACTER HEIGHT 1/8 EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

7▷ BORDER AREA WITHIN 9/16 IN. OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANOR AND FREE FROM PROTRUSIONS.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL PER ND 1002019.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

9▷ EXACT CONNECTOR LOCATION ON REAR OF POWER SUPPLY TO BE DETERMINED BY SUPPLIER.

PIN LIST

CONN. PART NO.	PIN LTR	PIN CONNECTION
10▷ MS3102E-~~24-22~~P	A	CHASSIS GRD
	B	OPEN
	C	115 V. AC HI
	D	115 V. AC LO
11▷ MS3102E-~~24~~-12S	A	OUTPUT HI
	B	OPEN
	C	OUTPUT LO
	D	OPEN
	E	OPEN

PIN LIST FOR 12▷ CONN. PART NO. MS3112E-~~20~~-16S, EXTERNAL CONNECTIONS

FOR LOCAL VOLTAGE ADJUSTING & SENSING PIN LTR	PIN CONNECTION	FOR REMOTE VOLTAGE ADJUSTMENT AND REMOTE SENSING PIN LTR	PIN CONNECTION
A	CHASSIS GRD	A	CHASSIS GRD
B		B	OPEN
C		C	
D		D	
E		E	
F	OPEN	F	
G		G	
H		H	OPEN
J	OPEN	J	
K		K	
L		L	
M		M	
N		N	
P		P	
R		R	
S		S	

REMOTE VOLTAGE ADJUSTMENT
LOAD
TWISTED SHIELDED PAIR

NON-FRONT PANEL CONTROLS: THE CURRENT LIMIT ADJUSTMENT CONTROL & VOLTAGE VERNIER & VOLTAGE ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY (WITH TOP COVER REMOVED). IT SHALL BE A SCREWDRIVER ADJUSTMENT WITH LOCKING DEVICE. EXACT LOCATION OF ADJUSTMENT CONTROL TO BE DETERMINED BY SUPPLIER.

5▷ THE 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020; CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH IN SHADED AREA DEFINED ON SIDE VIEW OF POWER SUPPLY.

OVERVOLTAGE PROTECTION: VOLTAGE AUTOMATICALLY LIMITED FROM RISING ABOVE 38V WHEN MEASURED AT POWER SUPPLY OUTPUT TERMINALS FOR ANY CONDITIONS INCLUDING OPEN REMOTE SENSING LEADS AND/OR OPEN REMOTE PROGRAMMING LEADS. PROVISION SHALL ALSO BE MADE TO PROTECT THE POWER SUPPLY FROM DAMAGE IF OUTPUT POWER LEADS, SENSING LEADS, OR PROGRAMMING LEADS ARE OPENED.

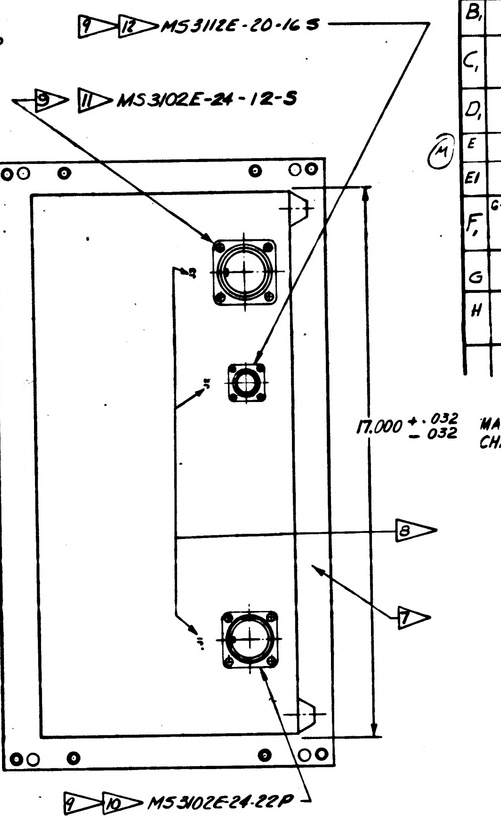
8▷ APPLY PER ND 1002019

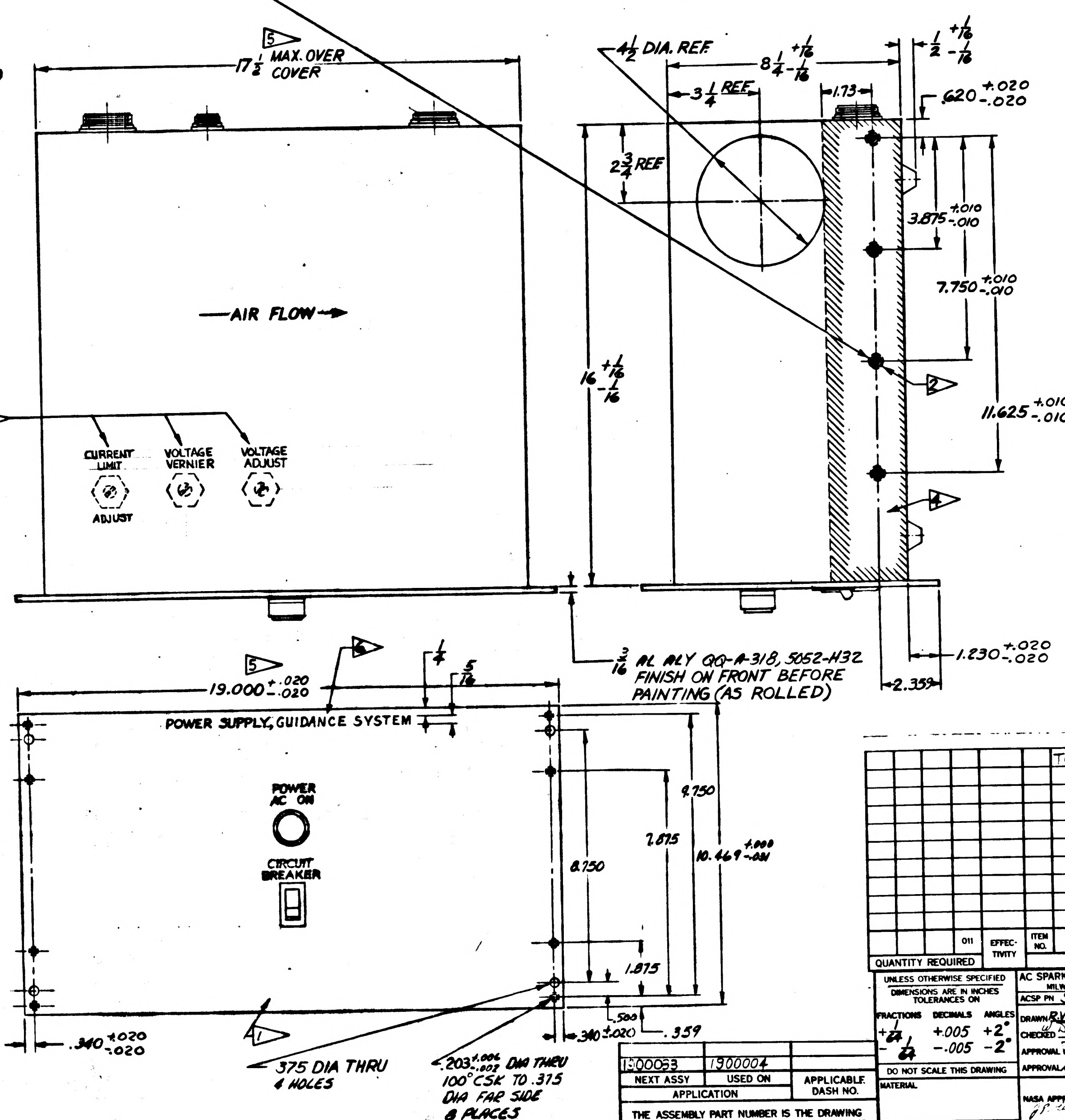
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
B1		(B1) REVISED & REDRAWN	D.O. 5309	3 FEB 63	
C1		(C1) REVISED	D.O. 51323	19-FEB-63	A.J.F.
D1		(D1) REVISED - ADDED NASA DRAWING NUMBER	D.O. 51408	APR-63	A.J.F.
E		(E1) REVISED REQUIREMENTS & PICTURE	D.O. 51438	APR 63	
E1		CHANGE IN ACCORDANCE WITH MXC 87144		63	
F1	G-5	(F) NOTE WAS "OVERVOLTAGE ··· THE OUTPUT TERMINALS ··· LEADS."	MXC 87892	12 JUL 63	
G		CHANGE IN ACCORDANCE WITH MXC 88465.		5 AUG 63	
H		CHANGE IN ACCORDANCE WITH MXC 189484 REVISED PER TDRR 03416		5 SEP 63	

Ⓜ





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

DATA SOURCE:
TRYGON ELECTRONICS INC
ROOSEVELT, L.I. N.Y.
MODEL C-36-50 (OV)

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	POWER SUPPLY (MODEL C-36-50)
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900033	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 −1/64 DECIMALS +.005 −.005 ANGLES +2° −2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44259
DRAWN R.W. HEISEL DATE 4 OCT 62
CHECKED W. Diehl 2 Apr '63
APPROVAL R. Rahn Apr 3, 1963
APPROVAL 3 APR 63
NASA APPROVAL 4-24-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY GUIDANCE SYSTEM

CODE IDENT NO.
SIZE E
1900021
SCALE —
SHEET

H
1900021
B

REQUIREMENTS:
DC OUTPUT:
VOLTAGE ADJUSTABLE RANGE: 23-33 VDC AT REMOTE SENSING POINT WITH AN OUTPUT LINE DROP OF 0 TO 3V.
CURRENT OUTPUT RANGE: 0-50 AMPS.
REGULATION:
LINE: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE OF AC LINE VOLTAGE FROM 105 TO 125 VOLTS WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.
LOAD: MUST BE LESS THAN 0.05% OVER THE RANGE OF 23-33 VOLTS FOR A CHANGE IN LOAD FROM ZERO TO 50 AMPERES WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.
RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD WHEN MEASURED AT REMOTE SENSOR CONNECTIONS.
STABILITY: OUTPUT SHALL VARY LESS THAN 28 MILLIVOLTS FOR 8 HOURS AFTER WARMUP UNDER FIXED LINE, LOAD, AND TEMPERATURE CONDITIONS.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENSE.

RECOVERY TIME TO OUTPUT REGULATION FOR A CHANGE FROM NO LOAD TO FULL LOAD: 100 MICROSECONDS MAX.

OVERSHOOT BEYOND REGULATED OUTPUT FOR A CHANGE FROM NO LOAD TO FULL LOAD: 2V. MAX.

TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 2% OR .5 VOLTS, WHICHEVER IS LARGER.

TEMPERATURE COEFFICIENT: LESS THAN 0.05% PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE, OR NEGATIVE.

PROGRAMMING-REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE: PROGRAMMING CONSTANT- 50 OHMS PER VOLT OF OUTPUT, MINIMUM 3 WATT RATING OF PROGRAMMING RESISTOR (REF).

REMOTE SENSING: VOLTAGE REGULATION MAINTAINED AT THE LOAD.
DC VOLTAGE ADJUSTMENT RESOLUTION: THE VERNIER VOLTAGE ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.
CIRCUIT PROTECTION-LOAD: CURRENT LIMITING CONTINUOUSLY ADJUSTABLE FROM 300 MILLIAMPS TO RATED OUTPUT CURRENT.

OUTPUT IMPEDENCE: .008 OHMS MAX. FROM DC TO 1KC..08 OHMS MAX FROM 1KC TO 10KC, AND .8 OHMS MAX. FROM 10KC TO 100KC WHEN MEASURED AT POWER SUPPLY OUTPUT TERMINALS.

THERMAL OVERLOAD PROTECTION: REQUIRED.

AC INPUT: VOLTAGE; 105-125 V. AC
FREQUENCY; 55-65 CPS
PHASE; SINGLE

TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING, AND REMOTE VOLTAGE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.

FRONT PANEL HARDWARE: INPUT CIRCUIT BREAKER, PILOT LIGHT.

FORCED AIR COOLING: DIRECTION AS SHOWN.

WEIGHT: MUST NOT EXCEED 130 LBS.

1▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME & FINISH COATS TO BE APPLIED TO PANEL FRONT & EDGES ONLY. APPLY 2 COATS OF TT-E-529A, CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED-STD-595.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP-1900021, POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

2▷ MOUNT NUT 1015798-010 FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

4▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SHADED AREA. (BOTH OUTER SIDES). THE CHASSIS SHALL BE STRONG ENOUGH IN THIS AREA TO SUPPORT THE UNIT WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

6▷ CHARACTERS, (PER ND 1002122.) CHARACTER HEIGHT 1/8 EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

7▷ BORDER AREA WITHIN 9/16 IN. OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANOR AND FREE FROM PROTRUSIONS.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL PER ND 1002019.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

NON-FRONT PANEL CONTROLS: THE CURRENT LIMIT ADJUSTMENT CONTROL & VOLTAGE VERNIER & VOLTAGE ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY (WITH TOP COVER REMOVED). IT SHALL BE A SCREWDRIVER ADJUSTMENT WITH LOCKING DEVICE. EXACT LOCATION OF ADJUSTMENT CONTROL TO BE DETERMINED BY SUPPLIER.

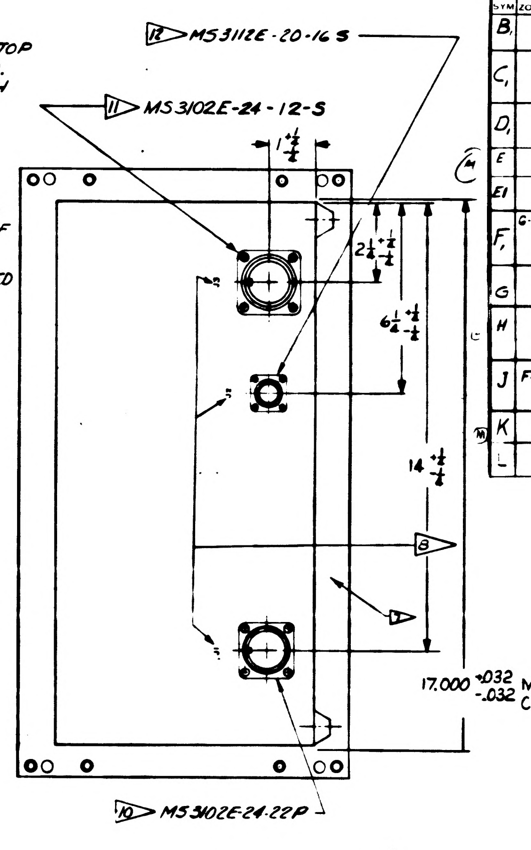
5▷ THE 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020; CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH IN SHADED AREA DEFINED ON SIDE VIEW OF POWER SUPPLY.

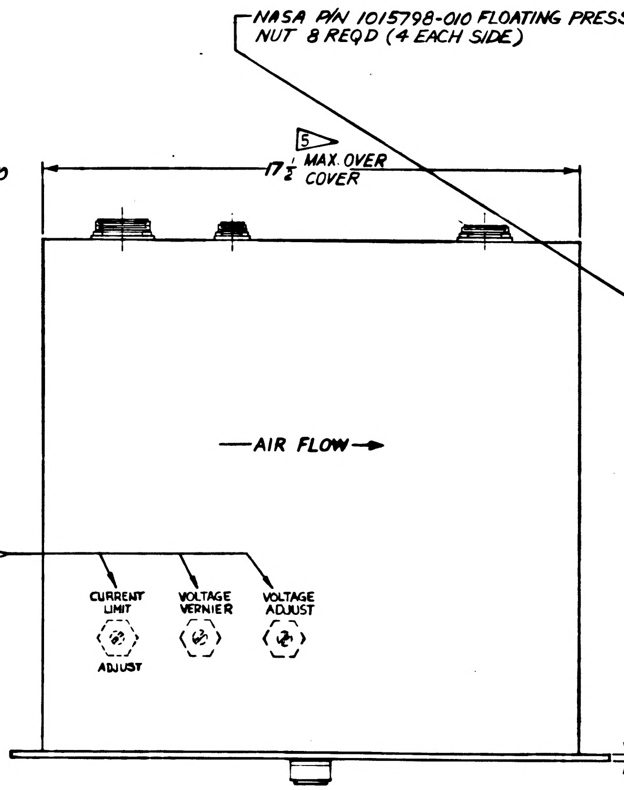
OVERVOLTAGE PROTECTION: VOLTAGE AUTOMATICALLY LIMITED FROM RISING ABOVE 38V WHEN MEASURED AT POWER SUPPLY OUTPUT TERMINALS FOR ANY CONDITIONS INCLUDING OPEN REMOTE SENSING LEADS AND/OR OPEN REMOTE PROGRAMMING LEADS. PROVISION SHALL ALSO BE MADE TO PROTECT THE POWER SUPPLY FROM DAMAGE IF OUTPUT POWER LEADS, SENSING LEADS, OR PROGRAMMING LEADS ARE OPENED.

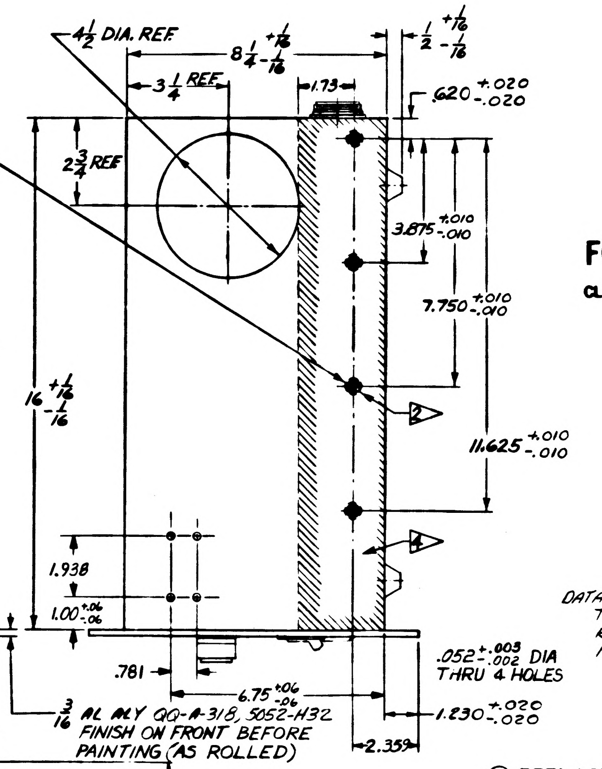
8▷ APPLY PER ND 1002019

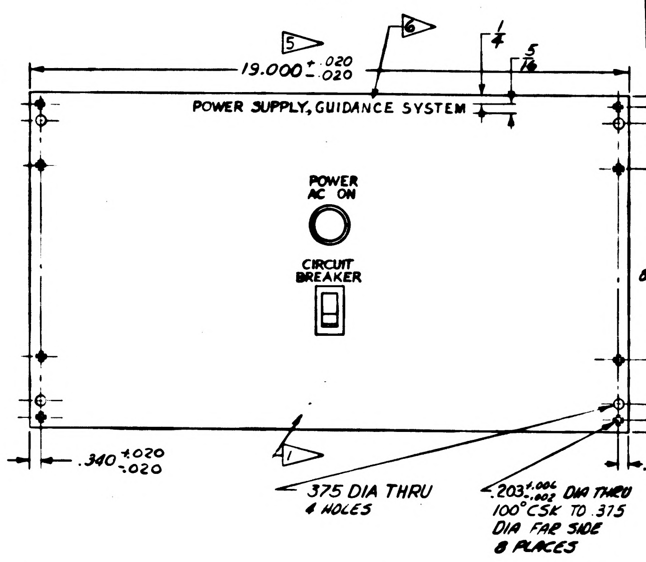
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B,		Ⓑ REVISED & REDRAWN	D.O.51309	3 FEB 63	
C,		Ⓒ REVISED	D.O. 51323	19 FEB 63	A.J.F.
D,		Ⓓ REVISED-ADDED NASA DRAWING NUMBER	D.O. 51408	APR 63	A.J.F. WL
E		Ⓔ REVISED REQUIREMENTS & PICTURE	D.O. 51430	APR 63	EM
E1		CHANGE IN ACCORDANCE WITH MXC 87144		8 JUN 63	
F,	G-5	Ⓕ NOTE WAS OVERVOLTAGE··· THE OUTPUT TERMINALS··· LEADS."	MXC 187892	12 JUL 63	WSM
G		CHANGE IN ACCORDANCE WITH MXC 88465.		5 AUG 63	A.M.D.
H		CHANGE IN ACCORDANCE WITH MXC 189484 REVISED PER TDRR 0341		5 SEP 63	JGL
J	F-7	IN PROGRAMMING PARAGRAPH NOTE "PROGRAMMING IS REMOTE ---- RESISTOR (REF) WAS "PROGRAMMING---RES." PER MXC 189982		17 OCT 63	
K		CHANGE IN ACCORDANCE WITH MXC 191973 PER TDRR 06091		13 NOV 63	WSM
L		REPLACED WITH CHANGE BY REV M PER TDRR 8863		MAY 65	









FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

DATA SOURCE:
TRYGON ELECTRONICS INC
ROOSEVELT, L.I. N.Y.
MODEL C-36-50 (OV)

Ⓛ REPLACED WITH CHANGE BY REV M

PIN LIST		
CONN. PART NO.	PIN LTR	PIN CONNECTION
10▷ MS3102E-24-22-P	A	CHASSIS GRD
	B	OPEN
	C	115 V. AC HI
	D	115 V. AC LO
11▷ MS3102E-24-12S	A	OUTPUT HI
	B	OPEN
	C	OUTPUT LO
	D	OPEN
	E	OPEN

PIN LIST FOR 12▷ CONN. PART NO. MS3112E-20-16S, EXTERNAL CONNECTIONS

FOR LOCAL VOLTAGE ADJUSTING & SENSING		FOR REMOTE VOLTAGE ADJUSTMENT AND REMOTE SENSING	
PIN LTR	PIN CONNECTION	PIN LTR	PIN CONNECTION
A	CHASSIS GRD	A	CHASSIS GRD
B		B	OPEN
C		C	
D		D	REMOTE VOLTAGE ADJUSTMENT
E		E	LOAD
F	OPEN	F	
G		G	
H		H	OPEN
J	OPEN	J	TWISTED SHIELDED PAIR
K		K	
L		L	
M		M	
N		N	
P		P	
R		R	
S		S	

					ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	POWER SUPPLY (MODEL C-36-50)
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900033	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44259
DRAWN R.W. HEISEL DATE 4 OCT 62
CHECKED W Diehl 3 APR '63
APPROVAL Z. Rahn Apr 3, 1963
APPROVAL 3 APR 63
NASA APPROVAL
MIT APPROVAL

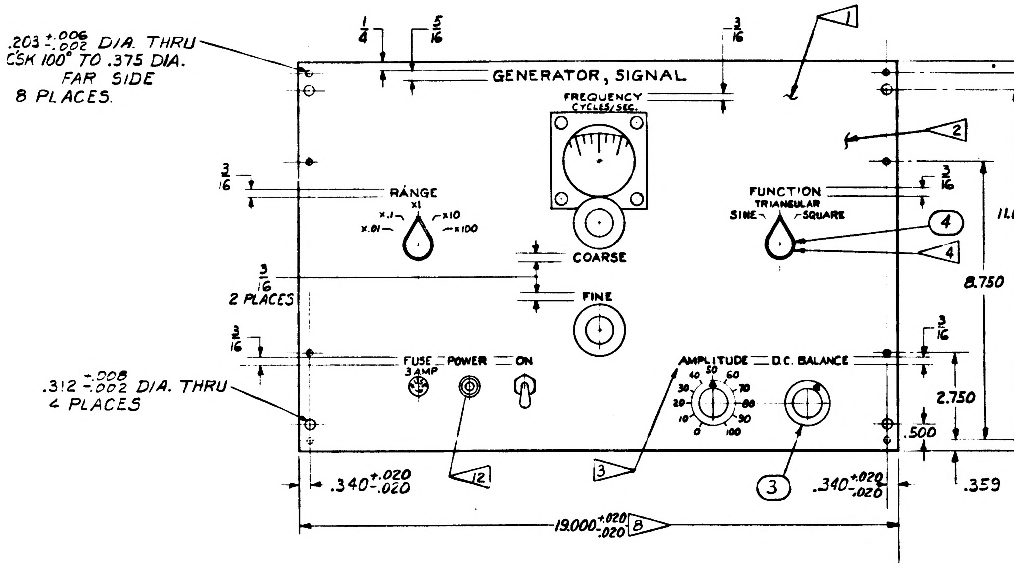
MANNED SPACECRAFT CENTER
HOUSTON TEXAS

POWER SUPPLY GUIDANCE SYSTEM

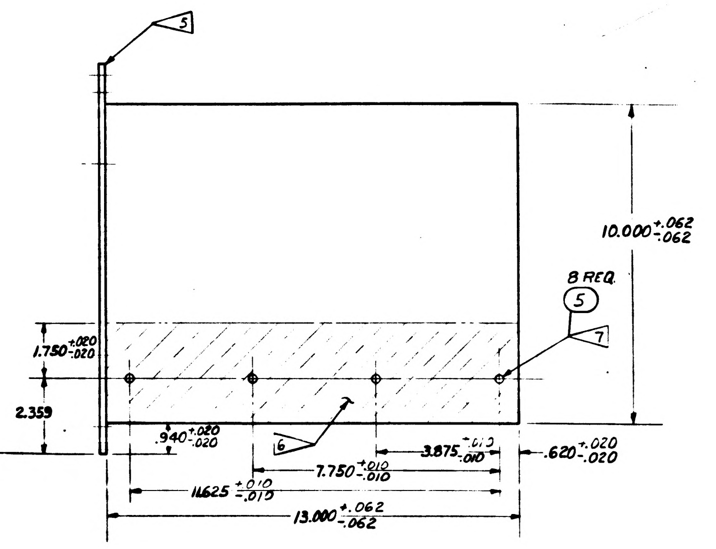
CODE IDENT NO. SIZE E 1900021
SCALE — SHEET

1900022 B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		REDRAWN & REVISED	CC 5 332	63	
B		DELETED ITEM 2 [illegible] LIST OF MATERIAL		63	

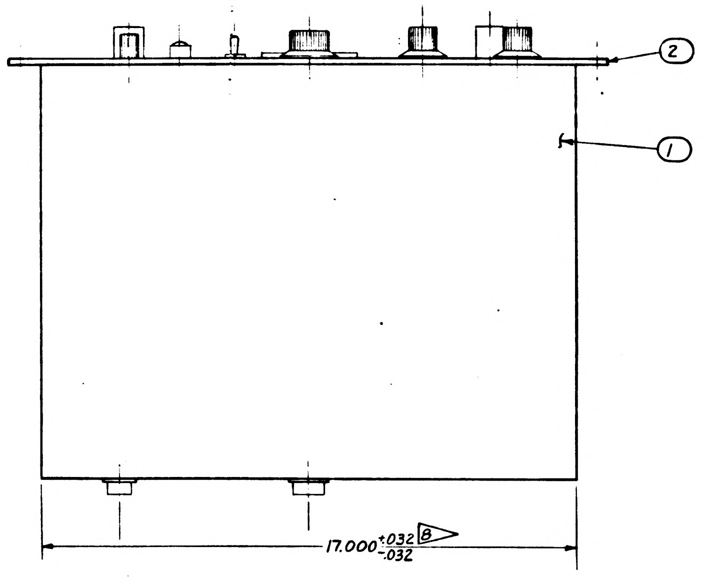


.203 +.006 -.002 DIA. THRU
CSK 100° TO .375 DIA.
FAR SIDE
8 PLACES.
1/4
5/16
3/16
GENERATOR, SIGNAL
FREQUENCY CYCLES/SEC.
1
2
RANGE
x1
x.1
x10
x.01
x100
COARSE
FINE
FUNCTION
TRIANGULAR
SINE
SQUARE
4
3/16
2 PLACES
FUSE 3 AMP
POWER
ON
AMPLITUDE
D.C. BALANCE
.312 +.008 -.002 DIA. THRU
4 PLACES
.340 +.020 -.020
12
3
19.000 +.020 -.020
B
11.000
8.750
11.500
12.219 +.000 -.031
2.750
.500
.359



5
10.000 +.062 -.062
8 REQ.
5
7
1.750 +.020 -.020
2.359
.940 +.020 -.020
6
3.875 +.010 -.010
.620 +.020 -.020
7.750 +.010 -.010
11.625 +.010 -.010
13.000 +.062 -.062

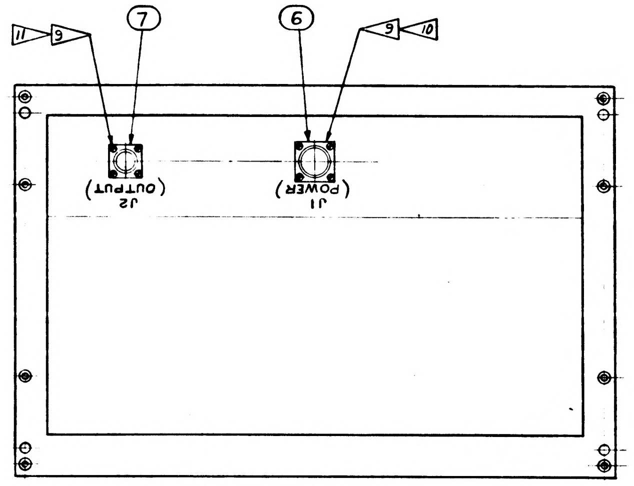
SIDE VIEW (REFLECTS BOTH SIDES)



2
1
17.000 +.032 -.032
B

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1210 DATE 8 May 63



11
9
7
6
9
10
J2 (OUTPUT)
J1 (POWER)

1900022 B

QUANTITY REQUIRED					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011	EFFECTIVITY			
			1		7	MS-3112E-12-10S	CONNECTOR
			1		6	MS-3112E-16-8P	CONNECTOR
			8		5	1015796-010	ANCHOR NUT
			2		4	MS-91528-	KNOBS TYPE K
			2		3	MS-91528-	KNOBS TYPE F
			1		2		
			1		1	TBA	GENERATOR (HP 202AR MOD)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900013-011	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$ $-\frac{1}{64}$	+.005 -.005	+1° -1°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44319
DRAWN Bob KARLING DATE 4-1-63
CHECKED 9 APR 63
APPROVAL 11 APR 63
APPROVAL 10 APR 63
NASA APPROVAL
Lester Goldman May 8 1963
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR - SIGNAL

CODE IDENT NO
SIZE E
1900022
SCALE HALF
SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1900022 A

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPD
		CHG NO		

REQUIREMENTS:-

FREQUENCY RANGE : 0.1 TO 200 CPS.

DIAL ACCURACY : 2 %

OUTPUT WAVEFORM : SINE

DISTORTION : 5 %

D. C. LEVEL OF OUTPUT : ± 200 MV D.C. MAX. AT 2 VOLTS PEAK TO PEAK AC SINE WAVE.

OUTPUT VOLTAGE:- 0 TO 10 VOLTS PEAK TO PEAK INTO 10 K LOAD. OUTPUT SHALL BE ISOLATED FROM CHASSIS. ANY CAPACITOR CONNECTING OUTPUT CIRCUITRY WITH CHASSIS SHALL BE REMOVED.

SUPPLY VOLTAGE : 105 TO 125 VOLTS, 60 ± 5 CPS. INPUT POWER SHALL BE ISOLATED FROM CHASSIS AND OUTPUT SIGNAL.

THE DC BALANCE SHALL BE CONTROLLED BY A FRONT - PANEL KNOB.

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ES-

THE EQUIPMENT SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

DATA SOURCE :
HEWLETT - PACKARD COMPANY
1501 PAGE MILL ROAD
PALO ALTO, CALIFORNIA
MODEL 202-AR
LOW FREQUENCY FUNCTION GENERATOR

NOTES :-

1 FRONT PANEL SHALL BE 3/16 ALUMINUM 5052-H32 (QQ-A-318 TEMPER H-32).

2 FRONT PANEL FINISH:- APPLY FINISH P513 OF SPEC. MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.
NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

3 CHARACTERS (FUTURA DEMIBOLD)
CHARACTER HEIGHT 1/8 INCH EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. APPLY PER ND-1002019.

4 KNOBS SHALL BE PER MS-91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK.

5 BORDER AREA, WITHIN 9/16 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

6 THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SLIDE MOUNTING AREA. THE SIDEWALL SHALL HAVE SUFFICIENT STRENGTH IN THIS AREA TO SUPPORT THE EQUIPMENT.

7 MOUNT ANCHOR NUT ITEM 5 OR EQUIVALENT ON THE INNER SURFACE OF THE CHASSIS AT THE CENTERS INDICATED. ALLOW 3/8 INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

8 SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. THE 17 INCH CHASSIS DIMENSION AND THE 19 INCH FRONT PANEL DIMENSION SHALL BE CENTRALIZED WITHIN .020 AT ASSEMBLY.

9 CONNECTORS:- NO CONNECTORS MAY APPEAR ON THE FRONT PANEL. EXACT LOCATION OF CONNECTORS ON THE REAR PANEL SHALL BE DETERMINED BY SUPPLIER. CONNECTORS SHALL BE LABELED AS SHOWN.

10 J1 POWER CONNECTOR MS-3112E-16-8P OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OPEN
C	OPEN
D	INPUT POWER HI
E	INPUT POWER LO
F,G,H	OPEN

11 J2 OUTPUT CONNECTOR MS-3112E-12-10S OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OUTPUT HI
C	OUTPUT LO
D	CHASSIS
E	OPEN
F	CHASSIS
G	OPEN
H	OPEN
J	CHASSIS
K	OPEN

12 POWER INDICATOR LENS SHALL BE GREEN.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

1900043-011	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ —	+ —
- —	- —	- —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 4439
DRAWN KARLING DATE 4-1-63
CHECKED Riehl 9 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 1963
L. Holman May 8, 1963
MIT APPROVAL

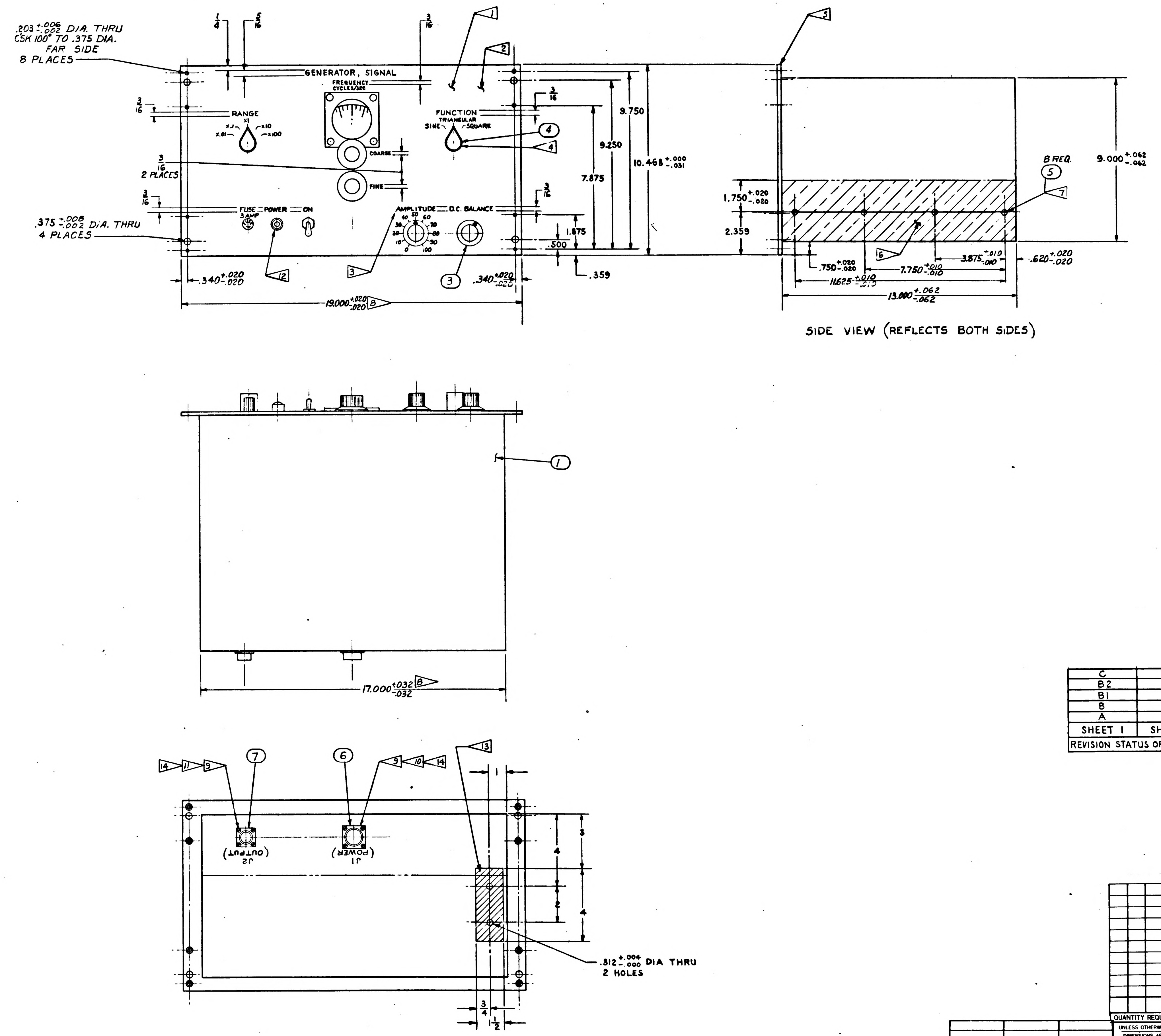
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR-
SIGNAL

CODE IDENT NO
SIZE E
1900022
SCALE —
SHEET 2 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REDRAWN & REVISED	[illegible] 5592	4-[illegible]-63	
B		DELETED ITEM 2 IN LIST OF MATERIAL		7 MAY 63	
B1		CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A.N.
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A.N.
C		CHANGE IN ACCORDANCE WITH MXC-188266 PER TDRR 03869		6 AUG 63	EM


.203 +.006 -.002 DIA. THRU
CSK 100° TO .375 DIA.
FAR SIDE
8 PLACES
1/4
5/16
3/16
GENERATOR, SIGNAL
FREQUENCY CYCLES/SEC
RANGE
X1
X.1
X10
X.01
X100
COARSE
FINE
FUNCTION
TRIANGULAR
SINE
SQUARE
3/16
2 PLACES
FUSE
3 AMP
POWER
ON
AMPLITUDE
D.C. BALANCE
.375 +.008 -.002 DIA. THRU
4 PLACES
.340 +.020 -.020
19.000 +.020 -.020
B
.340 +.020 -.020
9.750
9.250
7.875
10.468 +.000 -.031
1.875
.500
.359
1
2
3
4
12
1.750 +.020 -.020
2.359
8 REQ
5
6
7
9.000 +.062 -.062
.750 +.020 -.020
7.750 +.010 -.010
3.875 +.010 -.010
.620 +.020 -.020
11.625 +.010 -.010
13.000 +.062 -.062
17.000 +.032 -.032
14
11
9
10
13
J2 (OUTPUT)
J1 (POWER)
1
3
4
2
4
3/4
1/2
.312 +.004 -.000 DIA THRU
2 HOLES

SIDE VIEW (REFLECTS BOTH SIDES)

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 11210 DATE 8 May 63

SHEET 1	SHEET 2
C	C
B2	B2
B1	B1
B	A
A	A

REVISION STATUS OF SHEETS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1		7	MS-3112E-12-10S	CONNECTOR
			1		6	MS-3112E-16-8P	CONNECTOR
			8		5	1015798-010	ANCHOR NUT
			2		4	MS-91528-	KNOBS TYPE K
			2		3	MS-91528-	KNOBS TYPE F
			1		1	TBA	GENERATOR (HP 202AR MOD)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900143-011	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
± 1/64	±.005	±1°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44319
DRAWN Bob KARLING DATE 4-1-63
CHECKED [illegible] 9 APR '63
APPROVAL [illegible] 10 APR '63
APPROVAL [illegible] 10 APR 63
NASA APPROVAL [illegible]
Lester Goldman May 8 1963
MIT APPROVAL [illegible] 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR -
SIGNAL

CODE IDENT NO.
SIZE E
1900022
SCALE HALF
SHEET 1 OF 2

INCHES
PHOTOGRAPHIC SCALE ONLY

1900022 C

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
REVISIONS					
B1	6-7	CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A.N.
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A.N.
C		CHANGED IN ACCORDANCE WITH MXC-198466 PER TDRR 23809		63	

REQUIREMENTS:-

FREQUENCY RANGE: 0.1 TO 1200 CPS.

DIAL ACCURACY: LESS THAN 3% ERROR.

OUTPUT WAVEFORM: SINE, SQUARE

DISTORTION: LESS THAN 5%.

D. C. LEVEL OF OUTPUT: ± 200 MV D.C. MAX. AT 2 VOLTS PEAK TO PEAK AC SINE WAVE.

OUTPUT VOLTAGE:- 0 TO 10 VOLTS PEAK TO PEAK INTO 10 K LOAD.

ISOLATION: OUTPUT, POWER SOURCE AND CHASSIS MUST BE ISOLATED ELECTRICALLY FROM EACH OTHER FOR BOTH AC AND DC.

SUPPLY VOLTAGE: 105 TO 125 VOLTS, 60 ± 5 CPS. INPUT POWER SHALL BE ISOLATED FROM CHASSIS AND OUTPUT SIGNAL.

THE DC BALANCE SHALL BE CONTROLLED BY A FRONT-PANEL KNOB.

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900022.

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

DATA SOURCE:
HEWLETT-PACKARD COMPANY
1501 PAGE MILL ROAD
PALO ALTO, CALIFORNIA
MODEL 202-AR
LOW FREQUENCY FUNCTION GENERATOR

NOTES:-

1. FRONT PANEL SHALL BE 3/16 ALUMINUM 5052-H32

2. FRONT PANEL FINISH:- APPLY FINISH P513 OF SPEC. MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.
NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

3. CHARACTERS (FUTURA DEMIBOLD) PER ND1002122. CHARACTER HEIGHT 1/8 INCH EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. APPLY PER ND-1002019.

4. KNOBS SHALL BE PER MS-91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK.

5. BORDER AREA, WITHIN 9/16 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

6. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SLIDE MOUNTING AREA. THE SIDEWALL SHALL HAVE SUFFICIENT STRENGTH IN THIS AREA TO SUPPORT THE EQUIPMENT.

7. MOUNT ANCHOR NUT ITEM 5 OR EQUIVALENT ON THE INNER SURFACE OF THE CHASSIS AT THE CENTERS INDICATED. ALLOW 3/8 INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

8. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. THE 17 INCH CHASSIS DIMENSION AND THE 19 INCH FRONT PANEL DIMENSION SHALL BE CENTRALIZED WITHIN .020 AT ASSEMBLY.

9. CONNECTORS:- NO CONNECTORS MAY APPEAR ON THE FRONT PANEL. EXACT LOCATION OF CONNECTORS ON THE REAR PANEL SHALL BE DETERMINED BY SUPPLIER. CONNECTORS SHALL BE LABELED AS SHOWN.

10. J1 POWER CONNECTOR MS-3112E-16-8P OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OPEN
C	OPEN
D	INPUT POWER HI
E	INPUT POWER LO
F,G,H	OPEN

11. J2 OUTPUT CONNECTOR MS-3112E-12-10S OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OUTPUT HI
C	OUTPUT LO
D	OPEN
E	OPEN
F	OPEN
G	OPEN
H	OPEN
J	OPEN
K	OPEN

12. POWER INDICATOR LENS SHALL BE GREEN.

13. IN THE INDICATED AREA, 1/2 INCH CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACE. THERE SHALL BE NO PROTRUSIONS IN THIS AREA ON THE EXTERNAL SURFACE OF THE PANEL.

14. MARKING OF REFERENCE DESIGNATION AND CONNECTOR IDENTIFICATION CHARACTERS TO BE APPLIED PER NO. 1002019. CHARACTER HEIGHT 1/8" UNLESS OTHERWISE SPECIFIED.

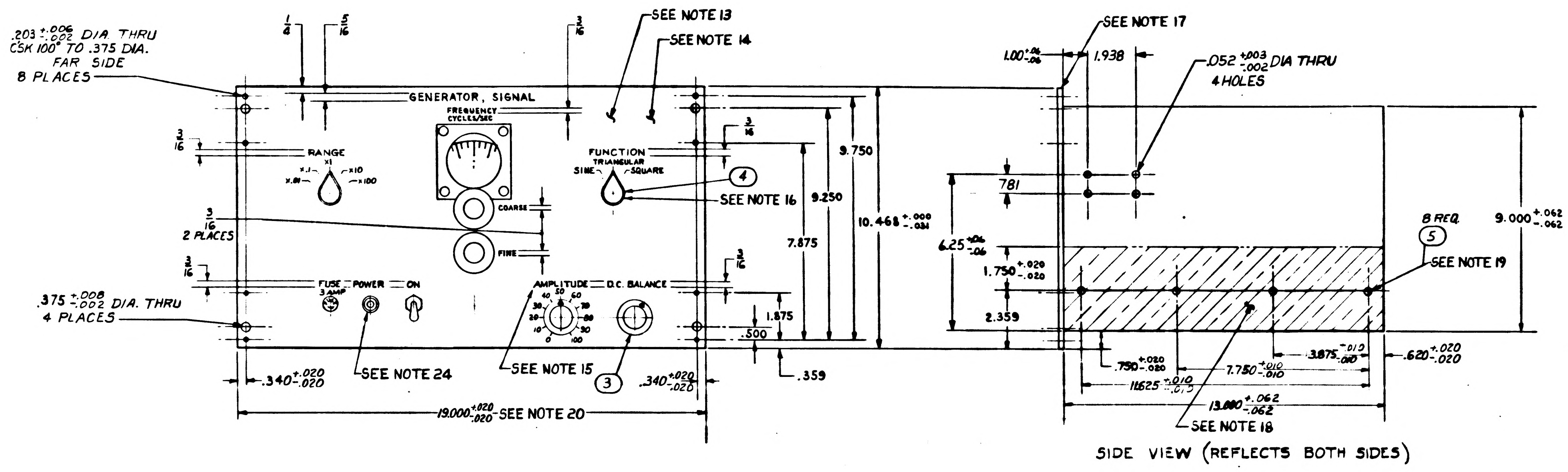
15. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01210 DATE 8 May 63

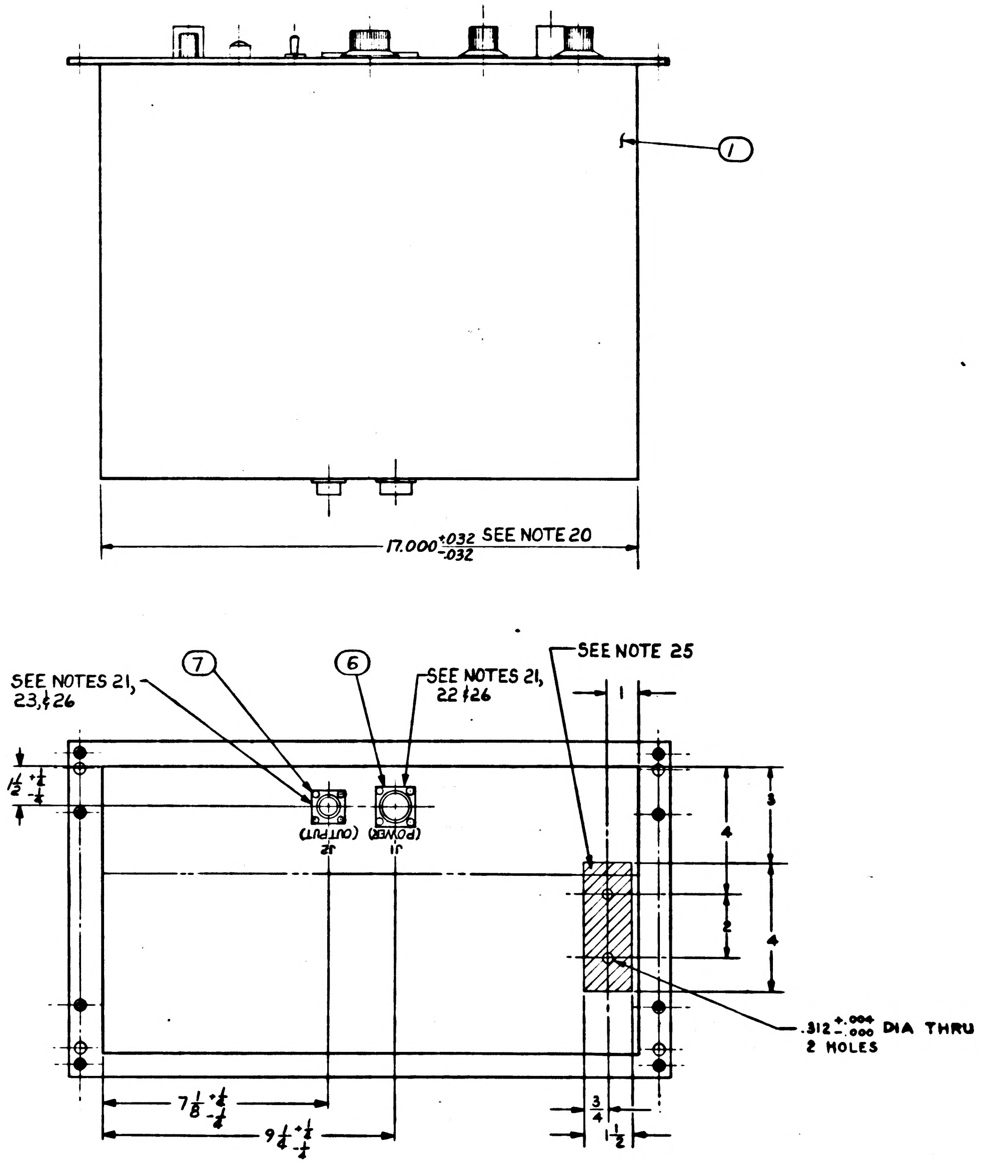
1900043-011	1900004	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± ± ±	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
NEXT ASSY	USED ON	DO NOT SCALE THIS DRAWING	ACSP PN 5K-44319	GENERATOR-SIGNAL
APPLICATION		MATERIAL	DRAWN KARLING DATE 4-1-63	CODE IDENT NO.
		CONTRACT NAS-9-497	CHECKED W. Diehl 9 APR 63	SIZE E
			APPROVAL 10 APR 63	1900022
			APPROVAL 10 APR 63	SCALE —
			NASA APPROVAL L. Goldman May 8, 1963	SHEET 2 OF 2
			MIT APPROVAL	

1900022

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		REDRAWN & REVISED	D.U. 51392	6 63	EC / DA
B		DELETED ITEM 2 IN LIST OF MATERIAL.		7 MAY 63	MK
B1		CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A.N. / CJP
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A.N. / CJP
C		CHANGE IN ACCORDANCE WITH MXC-188466 PER TDRR 03569		6 AUG 63 OCT 63	LEM / LEM MK
D		CHANGE IN ACCORDANCE WITH MXC 91974 PER TDRR 08092		13 NOV 63	



.203 +.006 -.002 DIA THRU CSK 100° TO .375 DIA. FAR SIDE 8 PLACES
1/4
5/16
3/16
SEE NOTE 13
SEE NOTE 14
GENERATOR, SIGNAL
FREQUENCY CYCLES/SEC
RANGE
FUNCTION
TRIANGULAR
SINE
SQUARE
COARSE
FINE
4
SEE NOTE 16
3/16 2 PLACES
FUSE 3 AMP
POWER
ON
AMPLITUDE
D.C. BALANCE
.375 +.008 -.002 DIA. THRU 4 PLACES
.340 +.020 -.020
SEE NOTE 24
SEE NOTE 15
3
19.000 +.020 -.020 SEE NOTE 20
9.750
9.250
7.875
10.468 +.000 -.031
1.875
.500
.359
SEE NOTE 17
1.00 +.06 -.06
1.938
.052 +.003 -.002 DIA THRU 4 HOLES
.781
6.25 +.06 -.06
1.750 +.020 -.020
2.359
8 REQ
5
SEE NOTE 19
9.000 +.062 -.062
.750 +.020 -.020
7.750 +.010 -.010
3.875 -.010 -.010
.620 +.020 -.020
11.625 +.010 -.010
13.000 +.062 -.062
SEE NOTE 18
SIDE VIEW (REFLECTS BOTH SIDES)



1
17.000 +.032 -.032 SEE NOTE 20
SEE NOTES 21, 23, & 26
7
6
SEE NOTES 21, 22 & 26
SEE NOTE 25
J2 (OUTPUT)
J1 (POWER)
1/2 +1/4 -1/4
3
4
2
4
1
.312 +.004 -.000 DIA THRU 2 HOLES
7 1/8 +1/4 -1/4
9 1/4 +1/4 -1/4
3/4
1 1/2

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01 DATE 8 May 63

D	D
C	C
B2	B2
B1	B1
B	B
A	A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1		7	MS-3112E-12-10S	CONNECTOR
			1		6	MS-3112E-16-8P	CONNECTOR
			8		5	1015798-010	ANCHOR NUT
			2		4	MS-91528-	KNOBS TYPE K
			2		3	MS-91528-	KNOBS TYPE F
			1		1	TBA	GENERATOR (HP 202AR MOD)

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900013-011	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64 − 1/64	+.005 −.005	+1° −1°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44319
DRAWN Bob KARLING DATE 4-1-63
CHECKED Diehl 9 APR '63
APPROVAL 10 APR '63
APPROVAL 10 APR 63
NASA APPROVAL
Lester Gedeman May 63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR - SIGNAL

CODE IDENT NO.
SIZE E
1900022
SCALE HALF
SHEET 1 OF 2

1900022 D

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B1	6-7	CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A.N.
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A.N.
C		CHANGED IN ACCORDANCE WITH MXC-188466 PER TDRR 63809		63	
D		CHANGE IN ACCORDANCE WITH MXC 191974 PER TDRR 08092		13 NOV 63	

REQUIREMENTS:-

1. FREQUENCY RANGE: 0.1 TO 1200 CPS.
2. DIAL ACCURACY: LESS THAN 3 % ERROR.
3. OUTPUT WAVEFORM: SINE, SQUARE
4. DISTORTION: LESS THAN 5 %.
5. D. C. LEVEL OF OUTPUT: ± 200 MV D.C. MAX. AT 2 VOLTS PEAK TO PEAK AC SINE WAVE.
6. OUTPUT VOLTAGE:- 0 TO 10 VOLTS PEAK TO PEAK INTO 10 K LOAD.
7. ISOLATION: OUTPUT, POWER SOURCE AND CHASSIS MUST BE ISOLATED ELECTRICALLY FROM EACH OTHER FOR BOTH AC AND DC.
8. SUPPLY VOLTAGE: 105 TO 125 VOLTS, 60 ± 5 CPS. INPUT POWER SHALL BE ISOLATED FROM CHASSIS AND OUTPUT SIGNAL.
9. THE DC BALANCE SHALL BE CONTROLLED BY A FRONT - PANEL KNOB.
10. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900022.
11. TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.
12. THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

DATA SOURCE:
HEWLETT - PACKARD COMPANY
1501 PAGE MILL ROAD
PALO ALTO, CALIFORNIA
MODEL 202-AR
LOW FREQUENCY FUNCTION GENERATOR

NOTES:-

13. FRONT PANEL SHALL BE 3/16 ALUMINUM 5052-H32
14. FRONT PANEL FINISH:- APPLY FINISH P513 OF SPEC. MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.
    NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.
15. CHARACTERS (FUTURA DEMIBOLD) PER ND1002122. CHARACTER HEIGHT 1/8 INCH EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. APPLY PER ND-1002019.
16. KNOBS SHALL BE PER MS-91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK.
17. BORDER AREA, WITHIN 9/16 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.
18. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SLIDE MOUNTING AREA. THE SIDE-WALL SHALL HAVE SUFFICIENT STRENGTH IN THIS AREA TO SUPPORT THE EQUIPMENT.
19. MOUNT ANCHOR NUT ITEM 5 OR EQUIVALENT ON THE INNER SURFACE OF THE CHASSIS AT THE CENTERS INDICATED. ALLOW 3/8 INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
20. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. THE 17 INCH CHASSIS DIMENSION AND THE 19 INCH FRONT PANEL DIMENSION SHALL BE CENTRALIZED WITHIN .020 AT ASSEMBLY.
21. CONNECTORS:- NO CONNECTORS MAY APPEAR ON THE FRONT PANEL. CONNECTORS SHALL BE LABELED AS SHOWN.
22. J1 POWER CONNECTOR MS-3112E-16-8P OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OPEN
C	OPEN
D	INPUT POWER HI
E	INPUT POWER LO
F, G, H	OPEN

23. J2 OUTPUT CONNECTOR MS-3112E-12-10S OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OUTPUT HI
C	OUTPUT LO
D	OPEN
E	OPEN
F	OPEN
G	OPEN
H	OPEN
J	OPEN
K	OPEN

24. POWER INDICATOR LENS SHALL BE GREEN.
25. IN THE INDICATED AREA, 1/2 INCH CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACE. THERE SHALL BE NO PROTRUSIONS IN THIS AREA ON THE EXTERNAL SURFACE OF THE PANEL.
26. MARKING OF REFERENCE DESIGNATION AND CONNECTOR IDENTIFICATION CHARACTERS TO BE APPLIED PER NO. 1002019. CHARACTER HEIGHT 1/8" UNLESS OTHERWISE SPECIFIED.
27. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. U1210 DATE 8 May 63

NEXT ASSY	USED ON
1900043-011	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN 5K-44319
DRAWN KARLING DATE 4-1-63
CHECKED Diehl 9 APR 63
APPROVAL
APPROVAL
NASA APPROVAL
L. Goldman May 8, 1963
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

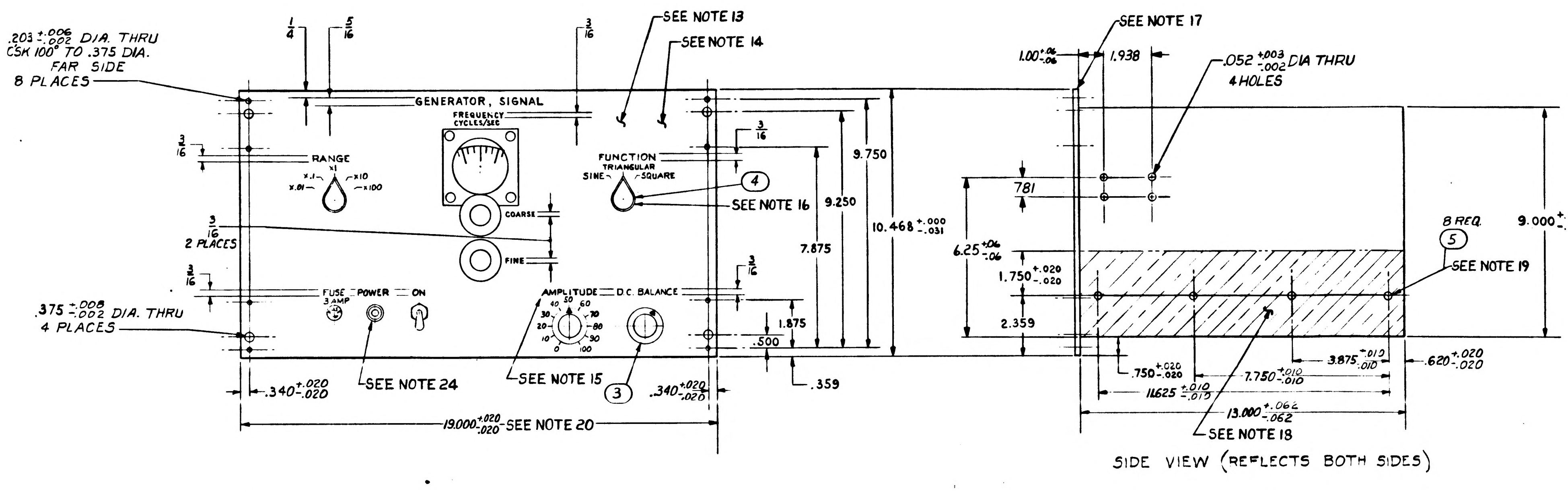
GENERATOR-
SIGNAL

CODE IDENT NO.
SIZE E
1900022
SCALE —
SHEET 2 OF 2

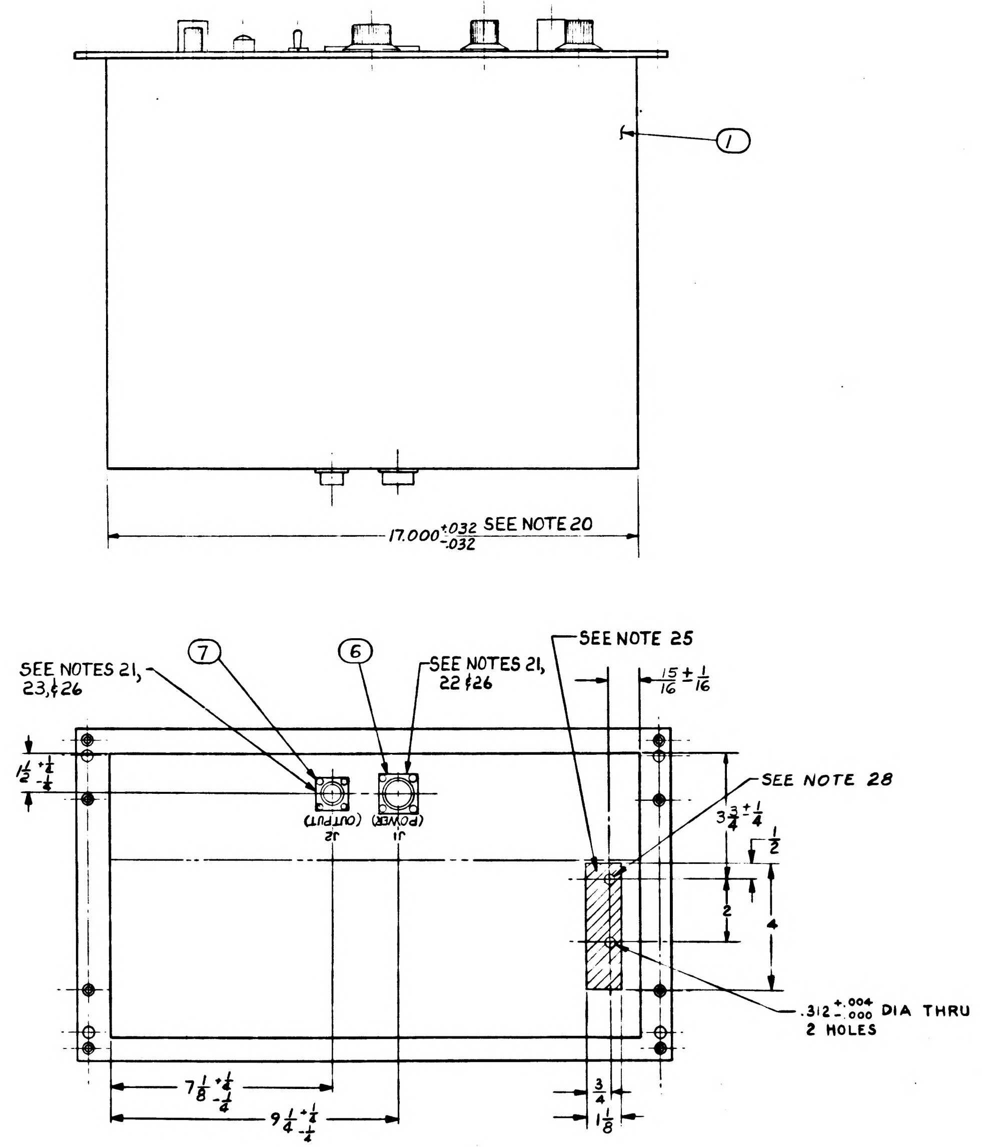
1900022 D

1900022 D

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
A		REDRAWN & REVISED	DD.5 592	63	
B		DELETED ITEM 2 IN LIST OF MATERIAL		7 MAY 63	
B1		CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A. N. C7F
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A. N. C7F
C		CHANGE IN ACCORDANCE WITH MXC-188466 PER TDRR 03569		6 AUG 63	EM
D		CHANGE IN ACCORDANCE WITH MXC 91976 PER TDRR 08092		3 NOV 63	
E	—	REVISED & UPGRADED PER TDRR 18387	—	23 APR 65	



.203 +.006 -.002 DIA. THRU CSK 100° TO .375 DIA. FAR SIDE 8 PLACES
1/4
5/16
3/16
SEE NOTE 13
SEE NOTE 14
GENERATOR, SIGNAL
FREQUENCY CYCLES/SEC
RANGE
FUNCTION
TRIANGULAR
SINE
SQUARE
COARSE
FINE
4
SEE NOTE 16
3/16 2 PLACES
FUSE 3 AMP
POWER
ON
AMPLITUDE
D.C. BALANCE
.375 +.008 -.002 DIA. THRU 4 PLACES
SEE NOTE 24
SEE NOTE 15
3
.340 +.020 -.020
19.000 +.020 -.020 SEE NOTE 20
9.750
9.250
7.875
10.468 +.000 -.031
1.875
.500
.359
SEE NOTE 17
1.00 +.06 -.06
1.938
.052 +.003 -.002 DIA THRU 4 HOLES
781
6.25 +.06 -.06
1.750 +.020 -.020
2.359
8 REQ.
5
SEE NOTE 19
9.000 +.062 -.062
.750 +.020 -.020
3.875 +.010 -.010
.620 +.020 -.020
11.625 +.010 -.010
7.750 +.010 -.010
13.000 +.062 -.062
SEE NOTE 18
SIDE VIEW (REFLECTS BOTH SIDES)



1
17.000 +.032 -.032 SEE NOTE 20
SEE NOTES 21, 23, & 26
7
6
SEE NOTES 21, 22 & 26
SEE NOTE 25
15/16 ± 1/16
J2 (OUTPUT)
J1 (POWER)
SEE NOTE 28
1 1/2 +1/4 -1/4
3 3/4 +1/4
1/2
2
4
.312 +.004 -.000 DIA THRU 2 HOLES
7 1/8 +1/4 -1/4
9 1/4 +1/4 -1/4
3/4
1 1/8

E	E
D	D
C	C
B2	B2
B1	B1
B	A
A	A
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1		7	MS-3112E-12-10S	CONNECTOR
			1		6	MS-3112E-16-8P	CONNECTOR
			8		5	1015798-010	ANCHOR NUT
			2		4	MS-91528-	KNOBS TYPE K
			2		3	MS-91528-	KNOBS TYPE F
			1		1	TBA	GENERATOR (HP 202AR MOD)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900043-011	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES +1° -1°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN 5K-44319
DRAWN Bob KARLING DATE 4-1-63
CHECKED 9 APR 63
APPROVAL
APPROVAL 10 APR 63
NASA APPROVAL
Lester Goldman May 8 63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

GENERATOR -
SIGNAL

CODE IDENT NO
SIZE E
1900022
SCALE HALF
SHEET 1 OF 2

1900022 E

1900022 D

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B1	G-7	CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A.N.
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A.N.
C		CHANGED IN ACCORDANCE WITH MXC-188466 PER TDRR [illegible]		[illegible]	[illegible]
D		CHANGE IN ACCORDANCE WITH MXC 191974 PER TDRR 18092		13 NOV 63	[illegible]
E	—	REVISED & UPGRADED PER TDRR 18387	—	23 APR 65	[illegible]

REQUIREMENTS:-

1. FREQUENCY RANGE: 0.1 TO 1200 CPS.
2. DIAL ACCURACY: LESS THAN 3% ERROR.
3. OUTPUT WAVEFORM: SINE, SQUARE
4. DISTORTION: LESS THAN 5%.
5. D.C. LEVEL OF OUTPUT: ± 200 MV D.C. MAX. AT 2 VOLTS PEAK TO PEAK AC SINE WAVE.
6. OUTPUT VOLTAGE:- 0 TO 10 VOLTS PEAK TO PEAK INTO 10 K LOAD.
7. ISOLATION: OUTPUT, POWER SOURCE AND CHASSIS MUST BE ISOLATED ELECTRICALLY FROM EACH OTHER FOR BOTH AC AND DC.
8. SUPPLY VOLTAGE: 105 TO 125 VOLTS, 60 ± 5 CPS. INPUT POWER SHALL BE ISOLATED FROM CHASSIS AND OUTPUT SIGNAL.
9. THE DC BALANCE SHALL BE CONTROLLED BY A FRONT-PANEL KNOB.
10. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900022.
11. TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.
12. THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

DATA SOURCE:
HEWLETT-PACKARD COMPANY
1501 PAGE MILL ROAD
PALO ALTO, CALIFORNIA
MODEL 202-AR
LOW FREQUENCY FUNCTION GENERATOR

NOTES:-

13. FRONT PANEL SHALL BE 3/16 ALUMINUM 5052-H32
14. FRONT PANEL FINISH:- APPLY FINISH P513 OF SPEC. MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.
    NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.
15. CHARACTERS (FUTURA DEMIBOLD) PER ND1002122. CHARACTER HEIGHT 1/8 INCH EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. APPLY PER ND-1002019.
16. KNOBS SHALL BE PER MS-91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK.
17. BORDER AREA, WITHIN 9/16 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.
18. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SLIDE MOUNTING AREA. THE SIDEWALL SHALL HAVE SUFFICIENT STRENGTH IN THIS AREA TO SUPPORT THE EQUIPMENT.
19. MOUNT ANCHOR NUT ITEM 5 OR EQUIVALENT ON THE INNER SURFACE OF THE CHASSIS AT THE CENTERS INDICATED. ALLOW 3/8 INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
20. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. THE 17 INCH CHASSIS DIMENSION AND THE 19 INCH FRONT PANEL DIMENSION SHALL BE CENTRALIZED WITHIN .020 AT ASSEMBLY.
21. CONNECTORS:- NO CONNECTORS MAY APPEAR ON THE FRONT PANEL. CONNECTORS SHALL BE LABELED AS SHOWN.
22. J1 POWER CONNECTOR MS-3112E-16-8P OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OPEN
C	OPEN
D	INPUT POWER HI
E	INPUT POWER LO
F, G, H	OPEN

23. J2 OUTPUT CONNECTOR MS-3112E-12-10S OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OUTPUT HI
C	OUTPUT LO
D	OPEN
E	OPEN
F	OPEN
G	OPEN
H	OPEN
J	OPEN
K	OPEN

24. POWER INDICATOR LENS SHALL BE GREEN.
25. IN THE INDICATED AREA, $\frac{1}{2}$ INCH CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACE. THERE SHALL BE NO PROTRUSIONS IN THIS AREA ON THE EXTERNAL SURFACE OF THE PANEL.
26. MARKING OF REFERENCE DESIGNATION AND CONNECTOR IDENTIFICATION CHARACTERS TO BE APPLIED PER NO. 1002019. CHARACTER HEIGHT $\frac{1}{8}$" UNLESS OTHERWISE SPECIFIED.
27. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
28. CENTRALIZE HOLE IN PERFORATION PATTERN TO AVOID INTERFERENCE WITH VENTILATION HOLES.

NEXT ASSY	USED ON
1900043-011	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-437

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44319
DRAWN KARLING DATE 4-1-63
CHECKED Diehl 9 APR 63
APPROVAL
APPROVAL 10 APR 63
NASA APPROVAL
L. Goldman May 8, 1963
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

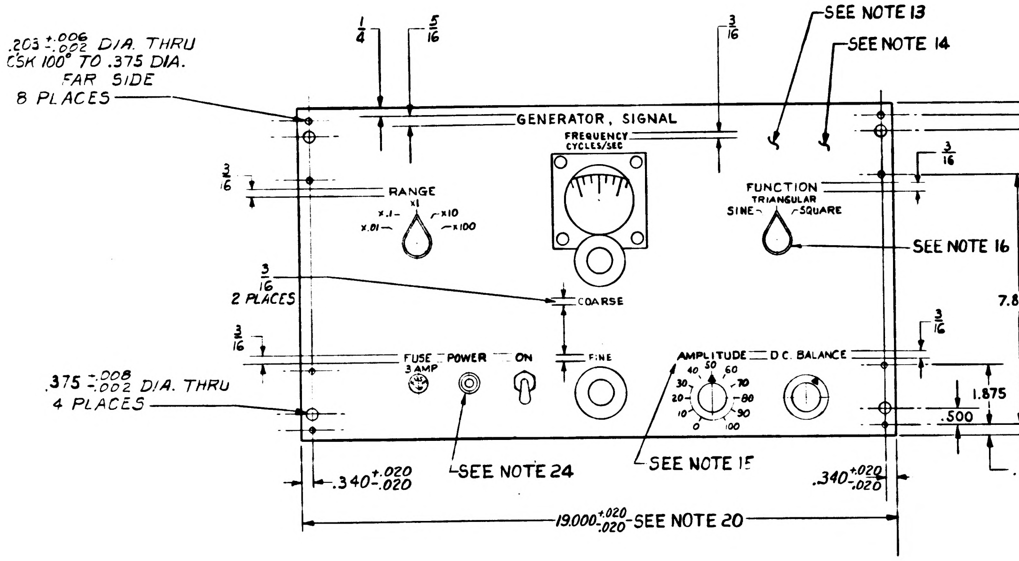
GENERATOR-SIGNAL

CODE IDENT NO
SIZE E
1900022
SCALE —
SHEET 2 OF 2

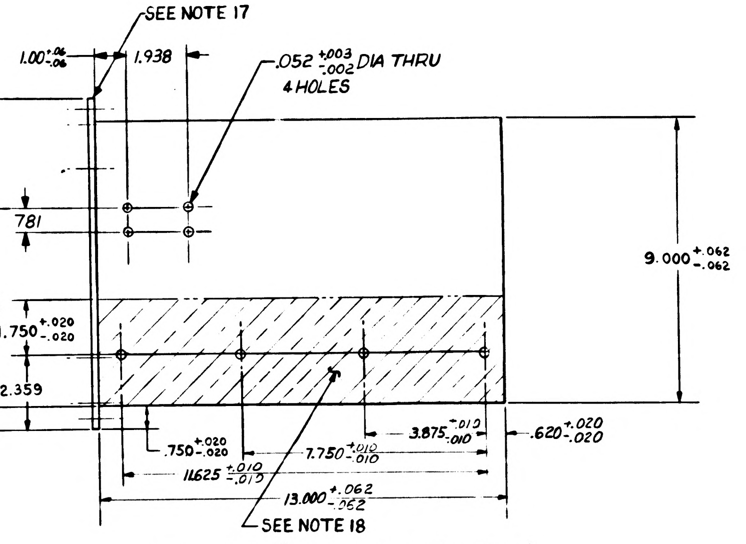
1900022 E

1900022 F

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		REDRAWN & REVISED	[illegible]	[illegible]	[illegible]
B		DELETED ITEM 2 LIST OF MATERIAL		[illegible]	[illegible]
B1		CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A.N.
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A.N.
C		CHANGE IN ACCORDANCE WITH MXC-188466 PER TDRR 03839		6 AUG 63	[illegible]
D		CHANGE IN ACCORDANCE WITH MXC 91976 PER TDRR 08092		[illegible] 63	[illegible]
E	—	REVISED & UPGRADED PER TDRR 8387	—	23 APR 65	[illegible]
F		REVISED PER TDRR 20924		[illegible]	[illegible]

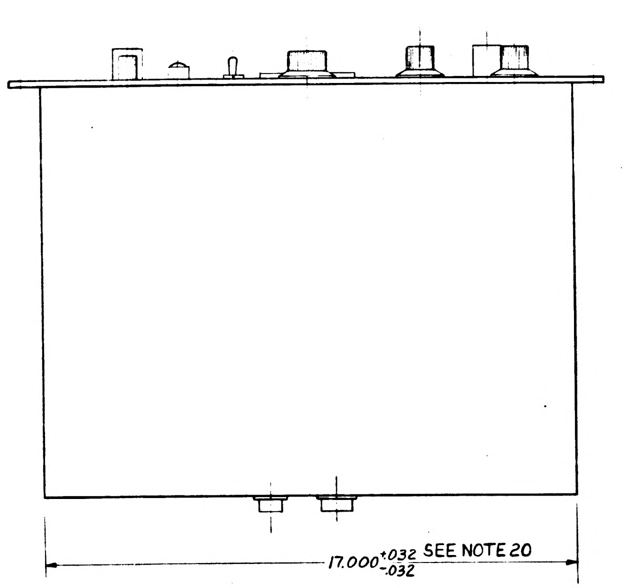


.203 +.006 -.002 DIA. THRU
CSK 100° TO .375 DIA.
FAR SIDE
8 PLACES
1/4
5/16
3/16
SEE NOTE 13
SEE NOTE 14
GENERATOR, SIGNAL
FREQUENCY CYCLES/SEC
RANGE
x.1 x1 x10
x.01 x100
FUNCTION
TRIANGULAR
SINE SQUARE
SEE NOTE 16
3/16
3/16 2 PLACES
COARSE
FINE
FUSE 3 AMP
POWER
ON
AMPLITUDE
D.C. BALANCE
.375 +.008 -.002 DIA. THRU
4 PLACES
9.750
9.250
7.875
10.468 +.000 -.031
1.875
.500
.359
.340 +.020 -.020
SEE NOTE 24
SEE NOTE 15
19.000 +.020 -.020 SEE NOTE 20

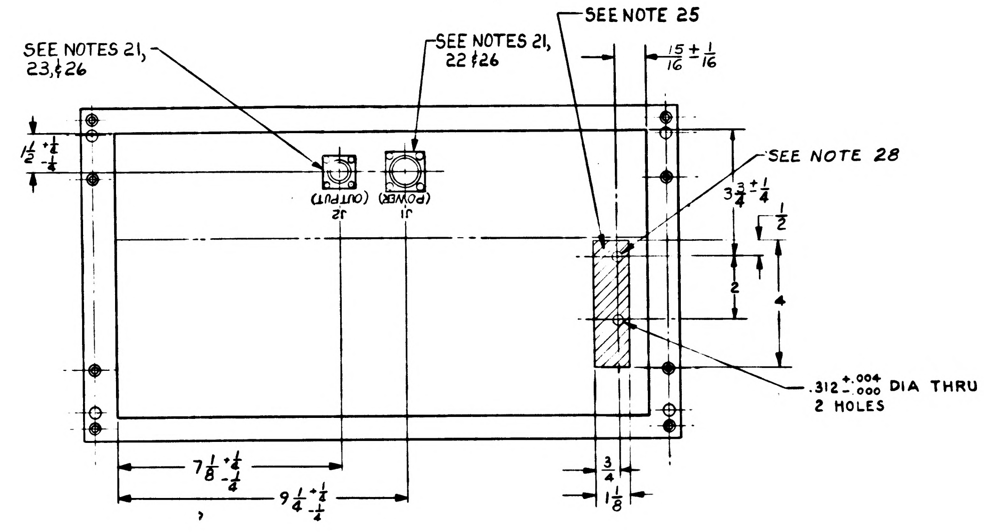


SEE NOTE 17
1.00 +.06 -.06
1.938
.052 +.003 -.002 DIA THRU
4 HOLES
.781
6.25 +.06 -.06
1.750 +.020 -.020
2.359
9.000 +.062 -.062
.750 +.020 -.020
3.875 +.010 -.010
.620 +.020 -.020
7.750 +.010 -.010
11.625 +.010 -.010
13.000 +.062 -.062
SEE NOTE 18

SIDE VIEW (REFLECTS BOTH SIDES)



17.000 +.032 -.032 SEE NOTE 20



SEE NOTES 21, 23, & 26
SEE NOTES 21, 22 & 26
SEE NOTE 25
15/16 ± 1/16
1 1/2 ± 1/4
J2 (OUTPUT)
J1 (POWER)
SEE NOTE 28
3 3/4 ± 1/4
1/2
2
4
.312 +.004 -.000 DIA THRU
2 HOLES
7 1/8 ± 1/4
9 1/4 ± 1/4
3/4
1 1/8

1900043-011	[illegible]	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$\pm\frac{1}{64}$	$\pm.005$	$\pm 1°$

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN 5K-44319
DRAWN Bob KARLING DATE 4-1-63
CHECKED [illegible] 9 APR 63
APPROVAL [illegible] 16 APR 63
APPROVAL [illegible] 10 APR 63
NASA APPROVAL [illegible]
Lester Goldman May [illegible]
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR -
SIGNAL
SOURCE CONTROL DRAWING

CODE IDENT NO
SIZE E
1900022
SCALE HALF
SHEET 1 OF 2

1900022 F

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B1	G-7	CHANGE IN ACCORDANCE WITH MXC-186394	MXC-186394	24 MAY 63	A.N.
B2		CHANGE IN ACCORDANCE WITH MXC-186685	MXC-186685	24 MAY 63	A.N.
C		CHANGED IN ACCORDANCE WITH MXC-188466 PER TDRR [illegible]		[illegible]	[illegible]
D		CHANGE IN ACCORDANCE WITH MXC 91974 PER TDRR 08092		3 NOV 63	[illegible]
E	—	REVISED & UPGRADED PER TDRR 18387	—	23 APR 65	[illegible]
F		REVISED PER TDRR 20924		[illegible]	

REQUIREMENTS:-

1. FREQUENCY RANGE: 0.1 TO 1200 CPS.
2. DIAL ACCURACY: LESS THAN 3% ERROR.
3. OUTPUT WAVEFORM: SINE, SQUARE
4. DISTORTION: LESS THAN 5%.
5. D.C. LEVEL OF OUTPUT: ± 200MV D.C. MAX. AT 2 VOLTS PEAK TO PEAK AC SINE WAVE.
6. OUTPUT VOLTAGE:-0 TO 10 VOLTS PEAK TO PEAK INTO 10 K LOAD.
7. ISOLATION: OUTPUT, POWER SOURCE AND CHASSIS MUST BE ISOLATED ELECTRICALLY FROM EACH OTHER FOR BOTH AC AND DC.
8. SUPPLY VOLTAGE: 105 TO 125 VOLTS, 60 ± 5 CPS. INPUT POWER SHALL BE ISOLATED FROM CHASSIS AND OUTPUT SIGNAL.
9. THE DC BALANCE SHALL BE CONTROLLED BY A FRONT-PANEL KNOB.
10. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900022.
11. TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.
12. THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

DATA SOURCE:
HEWLETT-PACKARD COMPANY
1501 PAGE MILL ROAD
PALO ALTO CALIFORNIA
MODEL C41-202AR
LOW FREQUENCY FUNCTION GENERATOR

NOTES:-

13. FRONT PANEL SHALL BE 3/16 ALUMINUM 5052-H32
14. FRONT PANEL FINISH:- APPLY FINISH P513 OF SPEC. MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.
    NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.
15. CHARACTERS (FUTURA DEMIBOLD) PER ND1002122. CHARACTER HEIGHT 1/8 INCH EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. APPLY PER ND-1002019.
16. KNOBS SHALL BE PER MS-91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK.
17. BORDER AREA, WITHIN 9/16 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.
18. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THE SLIDE MOUNTING AREA. THE SIDE-WALL SHALL HAVE SUFFICIENT STRENGTH IN THIS AREA TO SUPPORT THE EQUIPMENT.
19. MOUNT ANCHOR NUT P/N 1015798-010 OR EQUIVALENT ON THE INNER SURFACE OF THE CHASSIS AT THE CENTERS INDICATED. ALLOW 3/8 INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
20. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. THE 17 INCH CHASSIS DIMENSION AND THE 19 INCH FRONT PANEL DIMENSION SHALL BE CENTRALIZED WITHIN .020 AT ASSEMBLY.
21. CONNECTORS:- NO CONNECTORS MAY APPEAR ON THE FRONT PANEL. CONNECTORS SHALL BE LABELED AS SHOWN.
22. J1 POWER CONNECTOR MS-3112E-16-8P OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OPEN
C	OPEN
D	INPUT POWER HI
E	INPUT POWER LO
F, G, H	OPEN

23. J2 OUTPUT CONNECTOR MS-3112E-12-10S OR EQUIVALENT CRIMP TYPE.

PIN	CONNECT TO
A	CHASSIS
B	OUTPUT HI
C	OUTPUT LO
D	OPEN
E	OPEN
F	OPEN
G	OPEN
H	OPEN
J	OPEN
K	OPEN

24. POWER INDICATOR LENS SHALL BE GREEN.
25. IN THE INDICATED AREA, 1/2 INCH CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACE. THERE SHALL BE NO PROTRUSIONS IN THIS AREA ON THE EXTERNAL SURFACE OF THE PANEL.
26. MARKING OF REFERENCE DESIGNATION AND CONNECTOR IDENTIFICATION CHARACTERS TO BE APPLIED PER NO. 1002019. CHARACTER HEIGHT 1/8" UNLESS OTHERWISE SPECIFIED.
27. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
28. CENTRALIZE HOLE IN PERFORATION PATTERN TO AVOID INTERFERENCE WITH VENTILATION HOLES.
29. ONLY THE ITEM LISTED ON THIS DRAWING & INDENTIFIED BY SUPPLIERS NAME, ADDRESS & PART NUMBER HAS BEEN TESTED & APPROVED BY NASA FOR USE IN THE OPTICS INERTIAL TEST SET. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR TESTING & APPROVAL BY NASA

NEXT ASSY	USED ON
1900043-011	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
- — - — - —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-437

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44319
DRAWN KARLING DATE 4/63
CHECKED Diehl 9 APR 63
APPROVAL
APPROVAL [illegible] 10 APR 63
NASA APPROVAL [illegible]
L Goldman May 8, 1963
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR-
SIGNAL
SOURCE CONTROL DRAWING

CODE IDENT NO
SIZE E
1900022
SCALE —
SHEET 2 OF 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A₁	—	Ⓐ REVISED	D.O. 51452	5-APR-63	A.J.F.
(M) B₁		ADDED ITEM NO. 1		30 APR 63	

REQUIREMENTS:

DC OUTPUT:
VOLTAGE: 28VDC NOMINAL ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL.
CURRENT: OUTPUT RANGE 0-20 AMP.

REGULATION:
COMBINED, LESS THAN 1% OF MAX. OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD OR FULL LOAD TO NO LOAD COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC OR FROM 125 TO 105 VAC.

RIPPLE: LESS THAN 1% (RMS) OF MAX. OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE, & LOAD CURRENT.

OUTPUT IMPEDANCE: .05 OHM MAX. DC TO 100 CPS .5 OHM MAX. 100 CPS TO 10 KC.

RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.

OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.

TURN-ON, TURN-OFF OVERSHOOT: .75V MAX.

TEMPERATURE COEFFICIENT: .1% MAX. PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

EXTERNAL REMOTE PROGRAMMING TERMINALS: NOT REQUIRED

EXTERNAL REMOTE SENSING TERMINALS: NOT REQUIRED

CIRCUIT PROTECTION - LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 50 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT - VOLTAGE: 105 TO 125 VAC
- FREQUENCY: 50 TO 65 CPS
- PHASE: SINGLE

TERMINATIONS: INPUT & OUTPUT TO BE BROUGHT OUT AT REAR OF CHASSIS.

NON-FRONT PANEL CONTROLS: THE VOLTAGE ADJUST AND CURRENT LIMIT ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY WITH THE TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUT SIDE SURFACE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

FRONT PANEL - HARDWARE: CIRCUIT BREAKER AND PILOT LIGHT.

AIR CIRCULATION: INTERNAL

ISOLATION: POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN (ES-)ND-

THE POWER SUPPLY SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF (ES-)ND-

THE REAR FACE OF THE FRONT PANEL SHALL BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

WEIGHT: MUST NOT EXCEED 90 LBS.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE CONTROL ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

1 19 & 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. SIDES OF CHASSIS LOCATED BY 17 IN. DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.

2 FRONT PANEL FINISH - APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.

3 EXACT CONNECTOR LOCATION ON REAR OF POWER SUPPLY TO BE DETERMINED BY SUPPLIER.

4 MS 3112E-16-8P
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	CHASSIS GROUND
B	OPEN
C	OPEN
D	115V 60∽ INPUT HI
E	115V 60∽ INPUT LO

5 MS 3102E-22-5S
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	OPEN
B	28 VDC OUTPUT HI
C	OPEN
D	OPEN
E	28 VDC OUTPUT LO
F	OPEN

6 CHARACTERS, (FUTURA DEMIBOLD), CHARACTER HEIGHT 1/8" EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019, USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

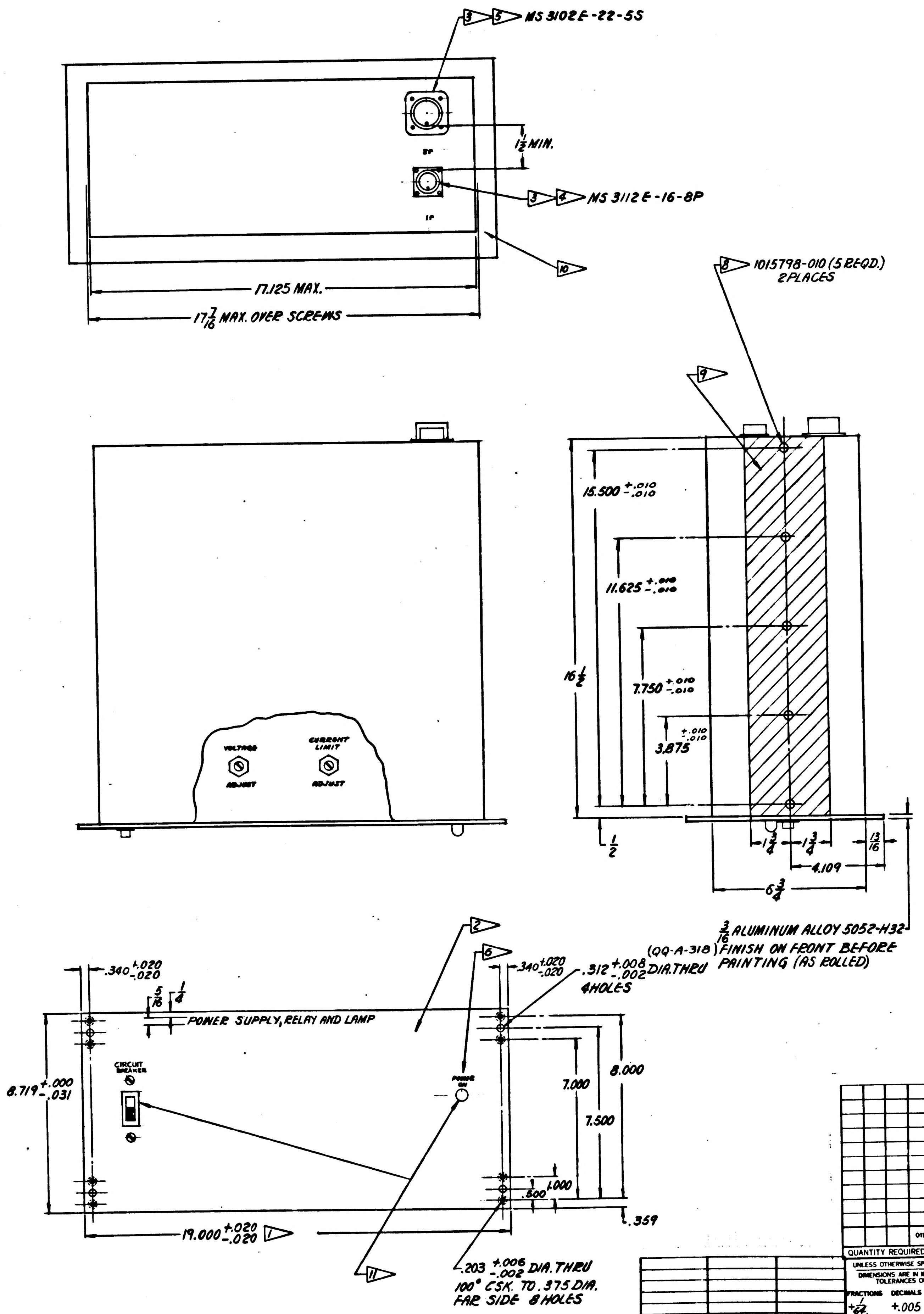
8 MOUNT NUT 1015798-010 FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

9 THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

10 BORDER AREA WITHIN 9/16 INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

11 EXACT FRONT PANEL LOCATION OF CIRCUIT BREAKER AND INDICATOR LIGHT TO BE DETERMINED BY VENDOR.

ORIGINAL SOURCE OF SUPPLY:
HARRISON LABORATORIES, INC.
45 INDUSTRIAL ROAD
BERKELEY HEIGHTS, N.J.
REF: MODEL 520A



FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01118 DATE 5-1-63

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
					1	TBA	POWER SUPPLY MODEL G-520A
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049	1900049	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+2°
$-\frac{1}{64}$	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4-3-63
CHECKED W. Diehl 8 APR 63
APPROVAL Apr 8, 1963
APPROVAL 10 APR 63
NASA APPROVAL 5-1-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
RELAY AND LAMP

CODE IDENT NO.
SIZE E
1900023
SCALE 1:2
SHEET

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A1	—	Ⓐ REVISED	D.O. 51452	5-APR-63	A. J. F.
B		ADDED ITEM NO. 1 PER MXC 186911		30 APR 63	
B1	—	CHANGE IN ACCORDANCE WITH MXC 187045		12 JUN 63	
C		CHANGE IN ACCORDANCE WITH MXC 188181		25 JUL 63	C.A.
D		CHANGE IN ACCORDANCE WITH MXC 188467		6 AUG 63	A.M.D.
E		CHANGE IN ACCORDANCE WITH MXC 189012 REVISED PER TDRR 03730		4 SEPT 63	W.S.

REQUIREMENTS:

DC OUTPUT:
VOLTAGE: 28VDC NOMINAL ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL.
CURRENT: OUTPUT RANGE 0-20 AMP.

REGULATION:
COMBINED, LESS THAN 1% OF MAX. OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD OR FULL LOAD TO NO LOAD COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC OR FROM 125 TO 105 VAC.

RIPPLE: LESS THAN 1% (RMS) OF MAX. OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE, & LOAD CURRENT.

OUTPUT IMPEDANCE: .05 OHM MAX. DC TO 100 CPS .5 OHM MAX. 100 CPS TO 10 KC, MEASURED AT PWR SUPPLY TERM.

RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.

OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.

TURN-ON, TURN-OFF OVERSHOOT: .75V MAX.

TEMPERATURE COEFFICIENT: .1% MAX. PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

EXTERNAL REMOTE PROGRAMMING TERMINALS: NOT REQUIRED

EXTERNAL REMOTE SENSING TERMINALS: NOT REQUIRED

CIRCUIT PROTECTION - LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 50 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT - VOLTAGE: 105 TO 125 VAC
- FREQUENCY: 55 TO 65 CPS
- PHASE: SINGLE

TERMINATIONS: INPUT & OUTPUT TO BE BROUGHT OUT AT REAR OF CHASSIS.

NON-FRONT PANEL CONTROLS: THE VOLTAGE ADJUST AND CURRENT LIMIT ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY WITH THE TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUT SIDE SURFACE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

FRONT PANEL - HARDWARE: CIRCUIT BREAKER AND PILOT LIGHT.

AIR CIRCULATION: FAN COOLED.

ISOLATION: POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900023.

WEIGHT: MUST NOT EXCEED 90 LBS.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE CONTROL ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

1 THE 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY; CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH IN SHADED AREA DEFINED ON SIDES OF POWER SUPPLY.

2 FRONT PANEL FINISH - APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.

3 EXACT CONNECTOR LOCATION ON REAR OF POWER SUPPLY TO BE DETERMINED BY SUPPLIER.

4 MS 3112E-16-8P
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	CHASSIS GROUND
B	OPEN
C	OPEN
D	115V 60~ INPUT HI
E	115V 60~ INPUT LO

5 MS 3102E-22-5S
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	OPEN
B	28 VDC OUTPUT HI
C	OPEN
D	OPEN
E	28 VDC OUTPUT LO
F	OPEN

6 CHARACTERS, PER ND 1002122, CHARACTER HEIGHT 1/8" EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019, USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

8 MOUNT NUT 1015798 -010 FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

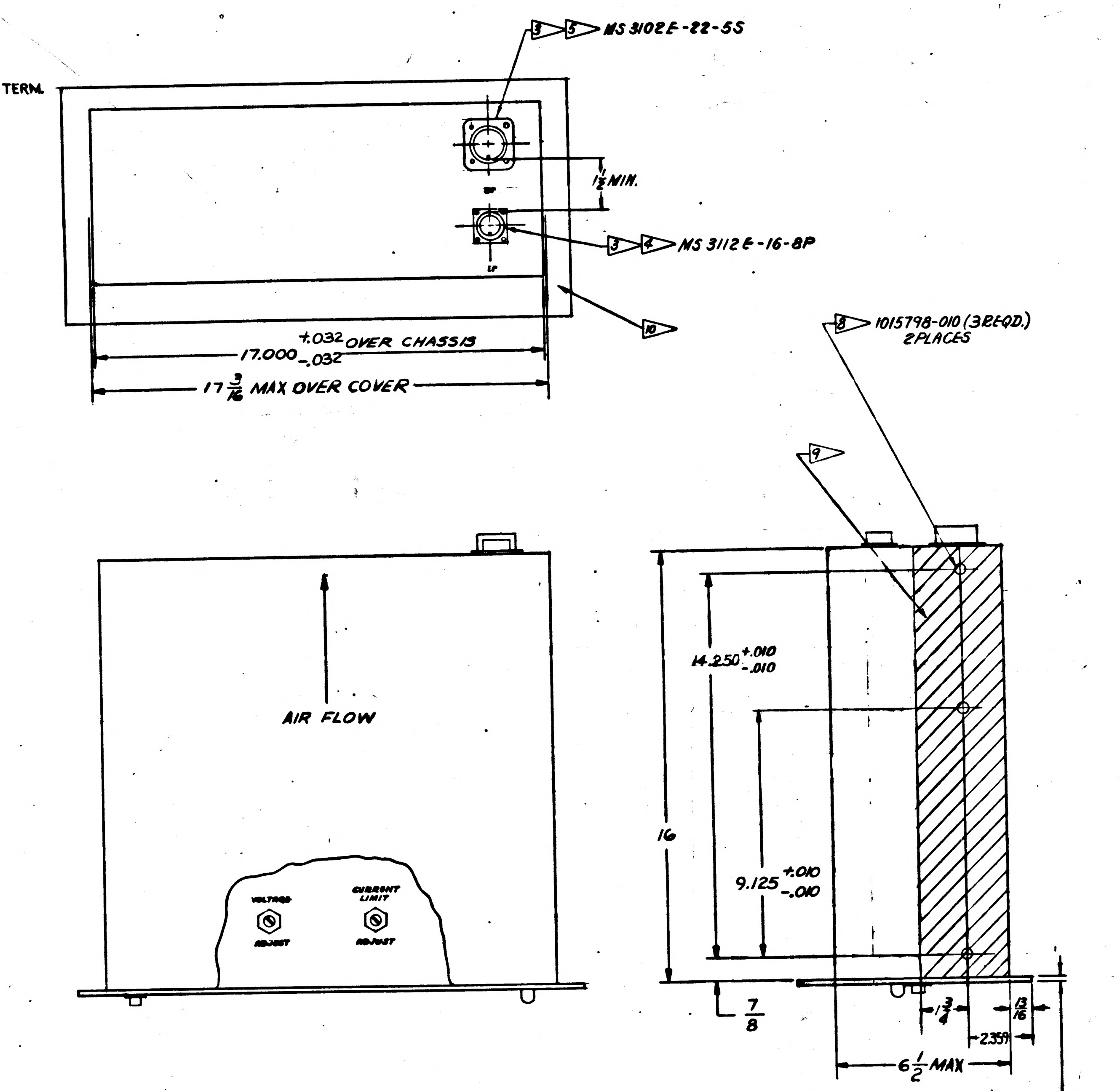
9 THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

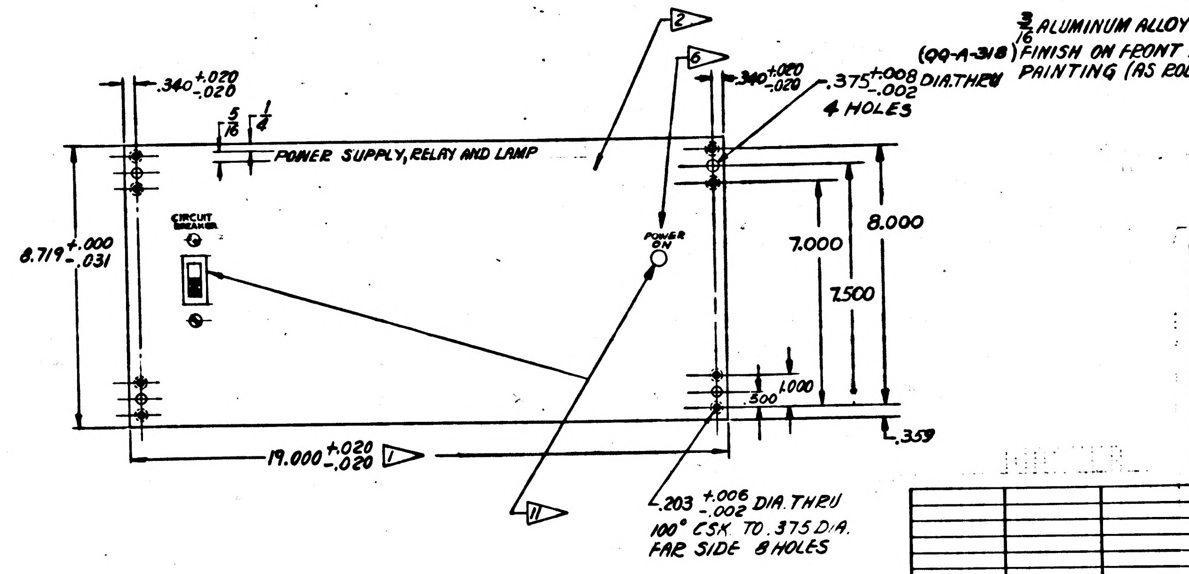
10 BORDER AREA WITHIN 9/16 INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

11 EXACT FRONT PANEL LOCATION OF CIRCUIT BREAKER AND INDICATOR LIGHT TO BE DETERMINED BY VENDOR.

12 INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DATA SOURCE:
TRYGON ELECTRONICS INC.
111 PLEASANT AVE
ROOSEVELT LT., NJ
MODEL SR-28-20




3/16 ALUMINUM ALLOY 5052-H32 (QQ-A-318) FINISH ON FRONT BEFORE PAINTING (AS ROLLED)
2
6
.340 +.020 -.020
.340 +.020 -.020
.375 +.008 -.002 DIA. THRU 4 HOLES
5/16
1/4
POWER SUPPLY, RELAY AND LAMP
CIRCUIT BREAKER
POWER ON
8.719 +.000 -.031
7.000
8.000
7.500
1.000
.500
.359
19.000 +.020 -.020
1
11
.203 +.006 -.002 DIA. THRU 100° CSK TO .375 DIA. FAR SIDE 8 HOLES

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01118 DATE 5-1-63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
					1	TBA	POWER SUPPLY MODEL SR-28-20 MOD.

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN F. LITZOW DATE 4-3-63
CHECKED W. Diehl 8 APR 63
APPROVAL R. Rahn Apr 8, 1963
APPROVAL 10 APR 63
NASA APPROVAL W. J. Rhine 5-1-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
RELAY AND LAMP

CODE IDENT NO.
SIZE E
1900023
SCALE 1:2
SHEET

1900023 E

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A₁	—	Ⓐ₁ REVISED	D.O. 51452	5-APR-63	A.J.F.
B		ADDED ITEM NO. 1 PER MXC 186911		30 APR 63	
B₁	—	CHANGE IN ACCORDANCE WITH MXC 187045		12 JUN 63	
C		CHANGE IN ACCORDANCE WITH MXC 188181		25 JUL 63	C.A.Y.
D		CHANGE IN ACCORDANCE WITH MXC 188467		6 AUG 63	A.M.D.
E		CHANGE IN ACCORDANCE WITH MXC 189012 REVISED PER TDRR 03739		SEPT 63	
F		CHANGE IN ACCORDANCE WITH MXC 39393		63	GFK
G		CHANGE IN ACCORDANCE WITH MXC 39948		12 NOV 63	GFK
H		CHANGE IN ACCORDANCE WITH MXC 39984		63	GFK
J		CHANGE IN ACCORDANCE WITH MXC 30368		13 NOV 63	GFK
K		CHANGE IN ACCORDANCE WITH MXC 192070 REVISED PER TDR 05851		63	

REQUIREMENTS:

DC OUTPUT:
VOLTAGE: 28VDC NOMINAL ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL.
CURRENT: OUTPUT RANGE 0-25 AMP.

REGULATION:
COMBINED, LESS THAN 1% OF MAX. OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD OR FULL LOAD TO NO LOAD COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC OR FROM 125 TO 105 VAC.

RIPPLE: LESS THAN 1% (RMS) OF MAX. OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE, & LOAD CURRENT.

OUTPUT IMPEDANCE: .05 OHM MAX. DC TO 100 CPS .5 OHM MAX. 100 CPS TO 10 KC, MEASURED AT PWR SUPPLY TERM.

RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.

OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.

TURN-ON, TURN-OFF OVERSHOOT: .75V MAX.

TEMPERATURE COEFFICIENT: .1% MAX. PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

EXTERNAL REMOTE PROGRAMMING TERMINALS: NOT REQUIRED

EXTERNAL REMOTE SENSING TERMINALS: NOT REQUIRED

CIRCUIT PROTECTION - LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 50 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT - VOLTAGE: 105 TO 125 VAC
- FREQUENCY: 55 TO 65 CPS
- PHASE: SINGLE

TERMINATIONS: INPUT & OUTPUT TO BE BROUGHT OUT AT REAR OF CHASSIS.

NON-FRONT PANEL CONTROLS: THE VOLTAGE ADJUST AND CURRENT LIMIT ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY WITH THE TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUT SIDE SURFACE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

FRONT PANEL - HARDWARE: CIRCUIT BREAKER AND PILOT LIGHT.

AIR CIRCULATION: FAN COOLED.

ISOLATION: POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900023.

WEIGHT: MUST NOT EXCEED 105 LBS.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 75 MV.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

1. THE 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY; CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH IN SHADED AREA DEFINED ON SIDES OF POWER SUPPLY.

2. FRONT PANEL FINISH - APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.

3

4. MS 3112E-16-8P
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	CHASSIS GROUND
B	OPEN
C	OPEN
D	115V 60∿ INPUT HI
E	115V 60∿ INPUT LO

5. MS 3102E-22-5S
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	OPEN
B	28 VDC OUTPUT HI
C	OPEN
D	OPEN
E	28 VDC OUTPUT LO
F	OPEN

6. CHARACTERS, PER ND 1002122, CHARACTER HEIGHT 1/8" EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019, USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

8. MOUNT NUT 1015798 -010 FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

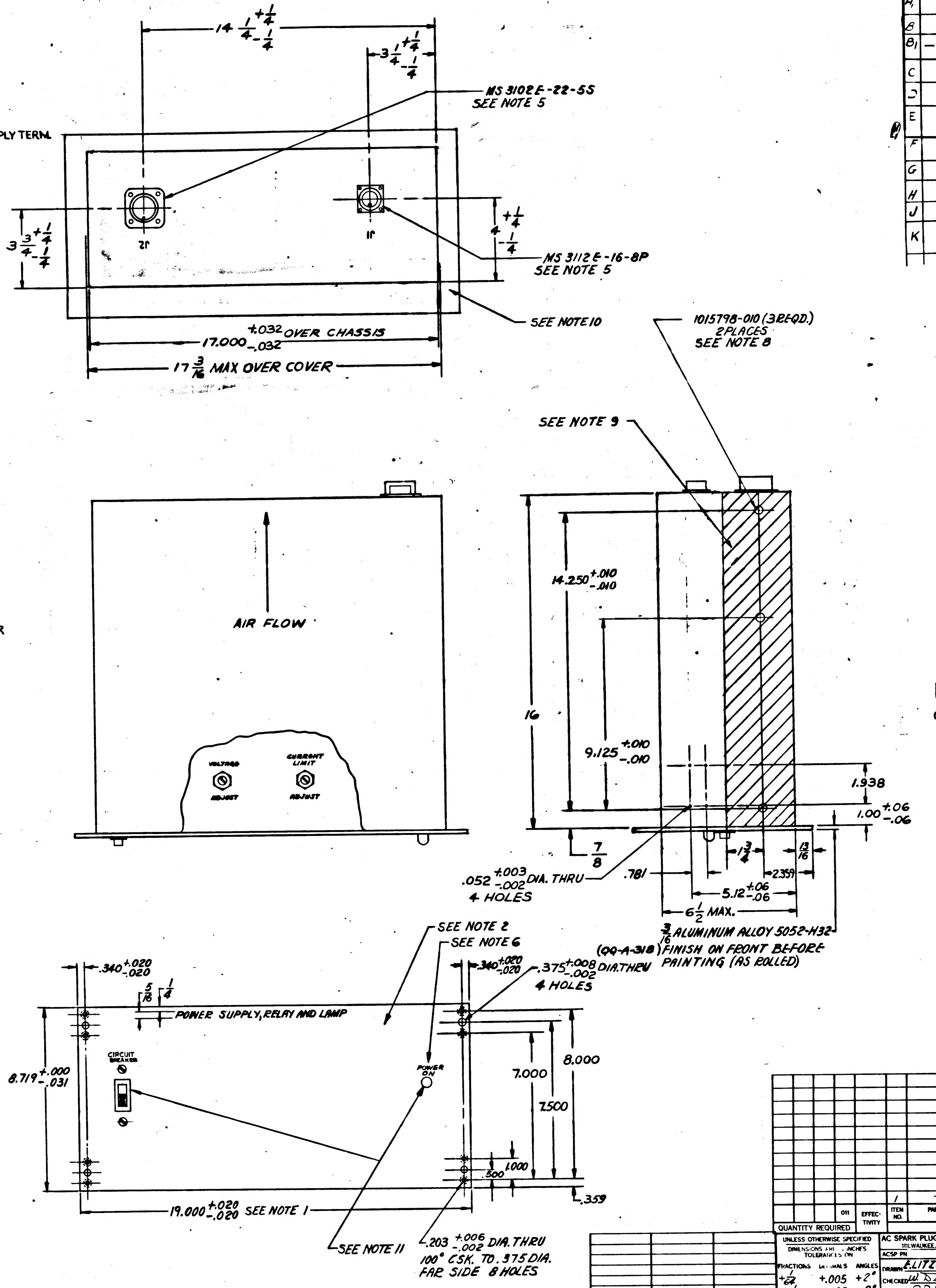
9. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

10. BORDER AREA WITHIN 9/16 INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

11. EXACT FRONT PANEL LOCATION OF CIRCUIT BREAKER AND INDICATOR LIGHT TO BE DETERMINED BY VENDOR.

12. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DATA SOURCE:
TRYGON ELECTRONICS INC.
111 PLEASANT AVE
ROOSEVELT LT., NJ
MODEL SR-28-20



14 +1/4 -1/4
3 +1/4 -1/4
MS 3102E-22-5S SEE NOTE 5
MS 3112E-16-8P SEE NOTE 5
J2
J1
3 3/4 +1/4 -1/4
4 +1/4 -1/4
SEE NOTE 10
17.000 +.032 -.032 OVER CHASSIS
17 3/16 MAX OVER COVER
1015798-010 (3 REQD.) 2 PLACES SEE NOTE 8
SEE NOTE 9
AIR FLOW
VOLTAGE ADJUST
CURRENT LIMIT ADJUST
14.250 +.010 -.010
16
9.125 +.010 -.010
1.938
1.00 +.06 -.06
7/8
.052 +.003 -.002 DIA. THRU 4 HOLES
.781
1 3/4
.2359
13/16
5.12 +.06 -.06
6 1/2 MAX.
3/16 ALUMINUM ALLOY 5052-H32 (QQ-A-318) FINISH ON FRONT BEFORE PAINTING (AS ROLLED)
SEE NOTE 2
SEE NOTE 6
.340 +.020 -.020
.340 +.020 -.020
5/16
1/4
.375 +.008 -.002 DIA. THRU 4 HOLES
POWER SUPPLY, RELAY AND LAMP
CIRCUIT BREAKER
POWER ON
8.719 +.000 -.031
7.000
8.000
7.500
1.000
.500
.359
19.000 +.020 -.020 SEE NOTE 1
SEE NOTE 11
.203 +.006 -.002 DIA. THRU 100° CSK. TO .375 DIA. FAR SIDE 8 HOLES

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01118 DATE 5-1-63

1900023

					1	TBA	POWER SUPPLY (MODEL SR-28-20 MOD)	
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS			

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4-3-63
CHECKED W. Diehl 8 APR 63
APPROVAL R. Rahn Apr 8, 1963
APPROVAL 10 APR 63
NASA APPROVAL W J Rhine 5-1-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
RELAY AND LAMP

CODE IDENT NO
SIZE E
1900023
SCALE 1/2
SHEET

REQUIREMENTS:

DC OUTPUT:
VOLTAGE: 28VDC NOMINAL ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL.
CURRENT: OUTPUT RANGE 0-25 AMP.

REGULATION:
COMBINED, LESS THAN 1% OF MAX. OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD OR FULL LOAD TO NO LOAD COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC OR FROM 125 TO 105 VAC.

RIPPLE: LESS THAN 1% (RMS) OF MAX. OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE, & LOAD CURRENT.

OUTPUT IMPEDANCE: .05 OHM MAX. DC TO 100 CPS .5 OHM MAX. 100 CPS TO 10 KC, MEASURED AT PWR SUPPLY TERM.

RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.

OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.

TURN-ON, TURN-OFF OVERSHOOT: .75V MAX.

TEMPERATURE COEFFICIENT: .1% MAX. PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

EXTERNAL REMOTE PROGRAMMING TERMINALS: NOT REQUIRED

EXTERNAL REMOTE SENSING TERMINALS: NOT REQUIRED

CIRCUIT PROTECTION - LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 50 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT - VOLTAGE: 105 TO 125 VAC
- FREQUENCY: 55 TO 65 CPS
- PHASE: SINGLE

TERMINATIONS: INPUT & OUTPUT TO BE BROUGHT OUT AT REAR OF CHASSIS.

NON-FRONT PANEL CONTROLS: THE VOLTAGE ADJUST AND CURRENT LIMIT ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY WITH THE TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUT SIDE SURFACE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

FRONT PANEL - HARDWARE: CIRCUIT BREAKER AND PILOT LIGHT.

AIR CIRCULATION: FAN COOLED.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900025.

ISOLATION: POWER INPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER. POWER OUTPUT SHALL HAVE EACH TERMINAL CONNECTED INTERNALLY TO THE CHASSIS THROUGH A 2MF CAPACITOR.

WEIGHT: MUST NOT EXCEED 105 LBS.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 75 MV.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

1. THE 19.000 & 17.000 DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY; CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, $\frac{.516}{.484}$ INCH FROM BACK SIDE OF FRONT PANEL, AND $\frac{.516}{.484}$ INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17.000 DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH IN SHADED AREA DEFINED ON SIDES OF POWER SUPPLY.

2. FRONT PANEL FINISH - APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.

3

4. MS 3112E-16-8P
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	CHASSIS GROUND
B	OPEN
C	OPEN
D	115V 60~ INPUT HI
E	115V 60~ INPUT LO

5. MS 3102E-22-5S
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	OPEN
B	28 VDC OUTPUT HI
C	OPEN
D	OPEN
E	28 VDC OUTPUT LO
F	OPEN

6. CHARACTERS, PER ND 1002122, CHARACTER HEIGHT $\frac{.141}{.109}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019, USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

8. MOUNT NUT 1015798 -010 FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{.391}{.359}$ IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

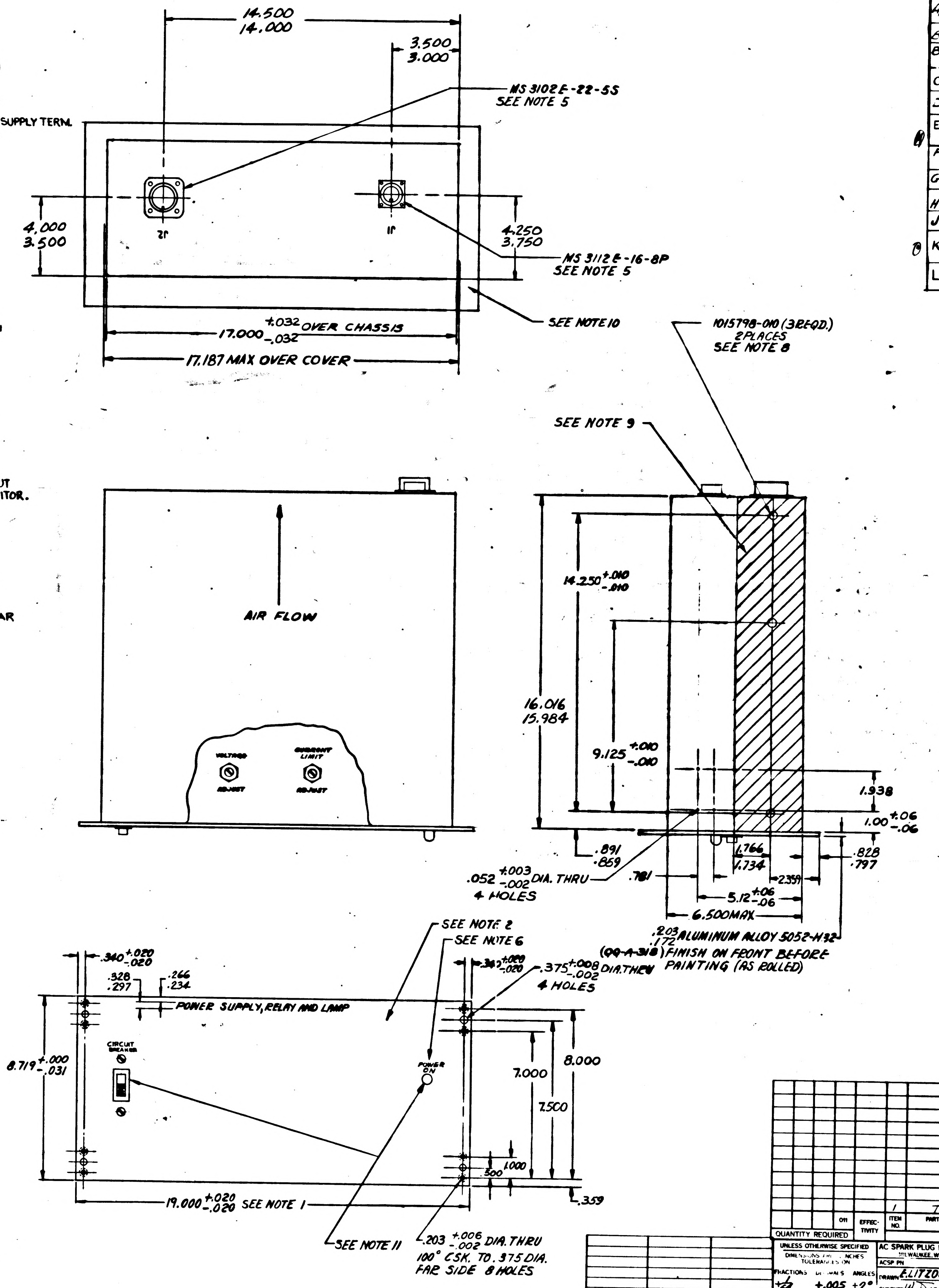
9. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

10. BORDER AREA WITHIN $\frac{.578}{.547}$ INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

11. EXACT FRONT PANEL LOCATION OF CIRCUIT BREAKER AND INDICATOR LIGHT TO BE DETERMINED BY VENDOR.

12. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DATA SOURCE:
TRYGON ELECTRONICS INC.
111 PLEASANT AVE
ROOSEVELT LT., NJ
MODEL SR-28-20


14.500
14.000
3.500
3.000
MS 3102E-22-5S
SEE NOTE 5
2J
1J
4.000
3.500
4.250
3.750
MS 3112E-16-8P
SEE NOTE 5
SEE NOTE 10
17.000 +.032 -.032 OVER CHASSIS
17.187 MAX OVER COVER
1015798-010 (3 REQD.)
2 PLACES
SEE NOTE 8
SEE NOTE 9
AIR FLOW
VOLTAGE ADJUST
CURRENT LIMIT ADJUST
14.250 +.010 -.010
16.016
15.984
9.125 +.010 -.010
1.938
1.00 +.06 -.06
.891
.859
.052 +.003 -.002 DIA. THRU
4 HOLES
.781
1.766
1.734
.828
.797
2.359
5.12 +.06 -.06
6.500 MAX
.203
.172 ALUMINUM ALLOY 5052-H32
(QQ-A-318) FINISH ON FRONT BEFORE PAINTING (AS ROLLED)
SEE NOTE 2
SEE NOTE 6
.340 +.020 -.020
.328
.297
.266
.234
.340 +.020 -.020
.375 +.008 -.002 DIA. THRU
4 HOLES
POWER SUPPLY, RELAY AND LAMP
CIRCUIT BREAKER
POWER ON
8.719 +.000 -.031
7.000
8.000
7.500
1.000
.500
.359
19.000 +.020 -.020 SEE NOTE 1
SEE NOTE 11
.203 +.006 -.002 DIA. THRU
100° CSK. TO .375 DIA.
FAR SIDE 8 HOLES

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A1	—	(A1). REVISED	D.O. 51452	15-APR-63	A.J.F.
B		ADDED ITEM NO. 1 PER MXC 186911		30 APR 63	
B1	—	CHANGE IN ACCORDANCE WITH MXC 187045		12 JUN 63	
C		CHANGE IN ACCORDANCE WITH MXC 188181		25 JUL 63	C.A.M.
D		CHANGE IN ACCORDANCE WITH MXC 188467		6 AUG 63	A.M.D.
E		CHANGE IN ACCORDANCE WITH MXC 189012 REVISED PER TDRR 03730		4 SEPT 63	
F		CHANGE IN ACCORDANCE WITH MXC 189695		25 OCT 63	GFK
G		CHANGE IN ACCORDANCE WITH MXC 33848		12 NOV 63	GFK
H		CHANGE IN ACCORDANCE WITH MXC 33984		13 NOV 63	GFK
J		CHANGE IN ACCORDANCE WITH MXC 90368		13 NOV 63	GFK
K		CHANGE IN ACCORDANCE WITH MXC 192070 REVISED PER TDR 05851		25 NOV 63	
L		CHANGE IN ACCORDANCE WITH CM 193991 REVISED PER TDRR 09394		7 FEB 64	MEM

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01118 DATE 5-1-63

		011	EFFECTIVITY	1	TBA	POWER SUPPLY MODEL SR-28-20MOD
QUANTITY REQUIRED				ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4-3-63
CHECKED W. Diehl 8 Apr 63
APPROVAL B. Rahn Apr 8, 1963
APPROVAL 10 APR 63
NASA APPROVAL W. J. [illegible] 5-1-63
J. P. [illegible]
MIT APPROVAL [illegible] 1 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY, RELAY AND LAMP.

CODE IDENT NO.
SIZE E
1900023
SCALE 1:2
SHEET

REQUIREMENTS:

DC OUTPUT:
VOLTAGE: 28VDC NOMINAL ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL.
CURRENT: OUTPUT RANGE 0-25 AMP.

REGULATION:
COMBINED, LESS THAN 1% OF MAX. OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD OR FULL LOAD TO NO LOAD COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC OR FROM 125 TO 105 VAC.

RIPPLE: LESS THAN 1% (RMS) OF MAX. OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE, & LOAD CURRENT.

OUTPUT IMPEDANCE: .05 OHM MAX. DC TO 100 CPS .5 OHM MAX. 100 CPS TO 10 KC, MEASURED AT PWR SUPPLY TERM.

RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.

OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.

TURN-ON, TURN-OFF OVERSHOOT: .75V MAX.

TEMPERATURE COEFFICIENT: .1% MAX. PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

EXTERNAL REMOTE PROGRAMMING TERMINALS: NOT REQUIRED

EXTERNAL REMOTE SENSING TERMINALS: NOT REQUIRED

CIRCUIT PROTECTION - LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 50 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT - VOLTAGE: 105 TO 125 VAC
- FREQUENCY: 55 TO 65 CPS
- PHASE: SINGLE

TERMINATIONS: INPUT & OUTPUT TO BE BROUGHT OUT AT REAR OF CHASSIS.

NON-FRONT PANEL CONTROLS: THE VOLTAGE ADJUST AND CURRENT LIMIT ADJUST CONTROLS SHALL BE ACCESSIBLE FROM THE TOP OF THE POWER SUPPLY WITH THE TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUT SIDE SURFACE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

FRONT PANEL - HARDWARE: CIRCUIT BREAKER AND PILOT LIGHT.

AIR CIRCULATION: FAN COOLED.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900023.

ISOLATION: POWER INPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER. POWER OUTPUT SHALL HAVE EACH TERMINAL CONNECTED INTERNALLY TO THE CHASSIS THROUGH A 2MF CAPACITOR.

WEIGHT: MUST NOT EXCEED 105 LBS.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 75 MV.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

1. THE 19.000 & 7.000 DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY; CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, $\frac{.516}{.484}$ INCH FROM BACK SIDE OF FRONT PANEL, AND $\frac{.516}{.484}$ INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17.000 DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH IN SHADED AREA DEFINED ON SIDES OF POWER SUPPLY.

2. FRONT PANEL FINISH - APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.

3

4. MS 3112E-16-8P
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	CHASSIS GROUND
B	OPEN
C	OPEN
D	115V 60∼ INPUT HI
E	115V 60∼ INPUT LO

5. MS 3102E-22-5S
EXTERNAL CONNECTIONS

PIN LETTER	PIN CONNECTIONS
A	OPEN
B	28 VDC OUTPUT HI
C	OPEN
D	OPEN
E	28 VDC OUTPUT LO
F	OPEN

6. CHARACTERS, PER ND 1002122, CHARACTER HEIGHT $\frac{.141}{.109}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019, USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

8. MOUNT NUT 1015798 -010 FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{.391}{.359}$ IN. SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

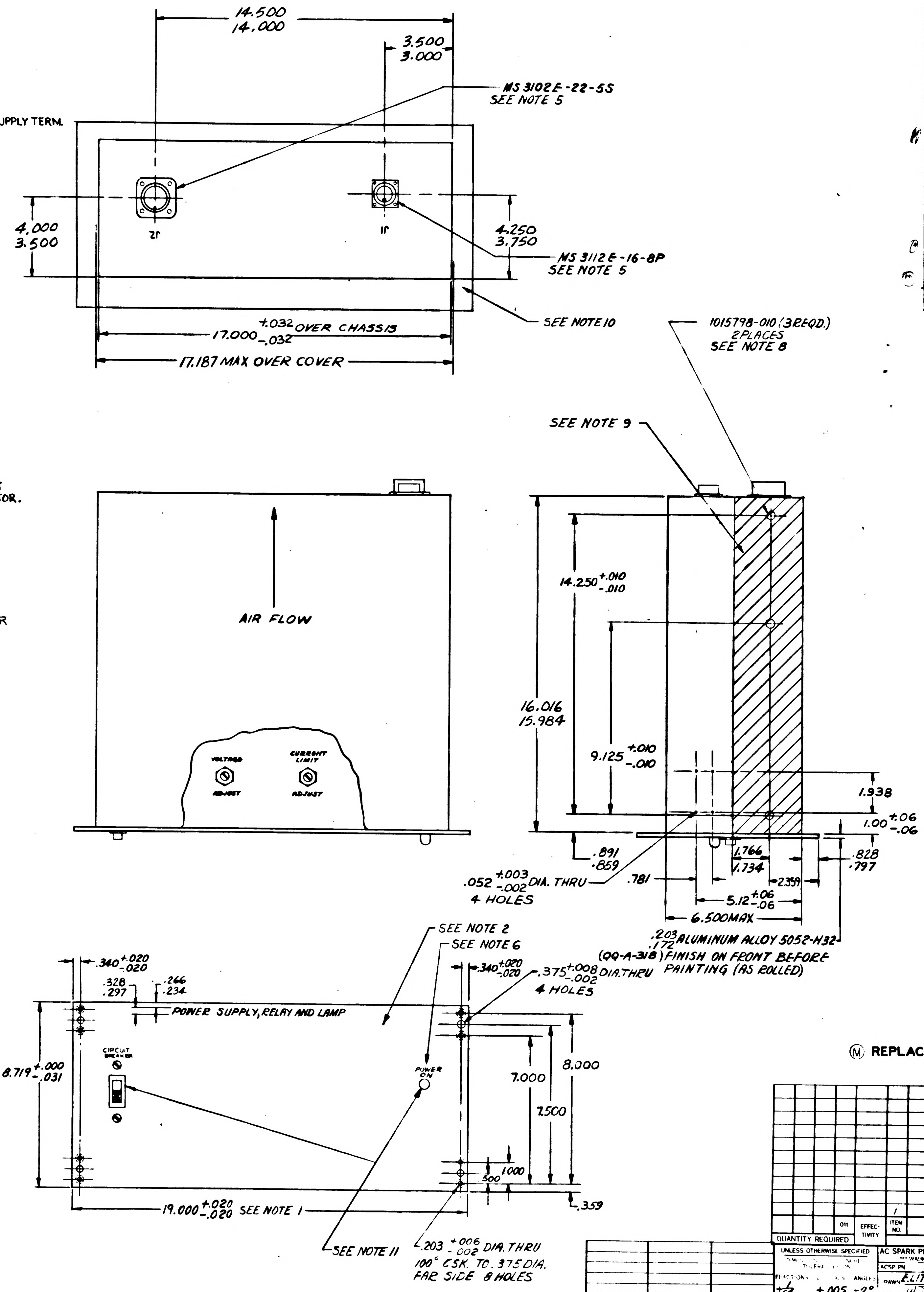
9. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

10. BORDER AREA WITHIN $\frac{.578}{.547}$ INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

11. EXACT FRONT PANEL LOCATION OF CIRCUIT BREAKER AND INDICATOR LIGHT TO BE DETERMINED BY VENDOR.

12. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DATA SOURCE:
TRYGON ELECTRONICS INC.
111 PLEASANT AVE
ROOSEVELT LT, NJ
MODEL SR-28-20


14.500
14.000
3.500
3.000
MS 3102E-22-5S SEE NOTE 5
J2
J1
4.000
3.500
4.250
3.750
MS 3112E-16-8P SEE NOTE 5
SEE NOTE 10
17.000 +.032 -.032 OVER CHASSIS
17.187 MAX OVER COVER
1015798-010 (3 REQD.) 2 PLACES SEE NOTE 8
SEE NOTE 9
AIR FLOW
VOLTAGE ADJUST
CURRENT LIMIT ADJUST
14.250 +.010 -.010
16.016
15.984
9.125 +.010 -.010
1.938
1.00 +.06 -.06
.891
.859
.052 +.003 -.002 DIA. THRU 4 HOLES
.781
1.766
1.734
.828
.797
2.359
5.12 +.06 -.06
6.500MAX
.203
.172 ALUMINUM ALLOY 5052-H32 (QQ-A-318) FINISH ON FRONT BEFORE PAINTING (AS ROLLED)
SEE NOTE 2
SEE NOTE 6
.340 +.020 -.020
.328
.297
.266
.234
POWER SUPPLY, RELAY AND LAMP
.375 +.008 -.002 DIA.THRU 4 HOLES
CIRCUIT BREAKER
POWER ON
8.719 +.000 -.031
8.000
7.000
7.500
1.000
.500
.359
19.000 +.020 -.020 SEE NOTE 1
SEE NOTE 11
.203 +.006 -.002 DIA. THRU 100° CSK. TO .375 DIA. FAR SIDE 8 HOLES

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A	—	Ⓐ REVISED	D.C 51452	5 APR 63	[illegible]
B		ADDED ITEM NO. 1 PER MXC 186911		30 APR 63	
B1	—	CHANGE IN ACCORDANCE WITH MXC 187045		12 JUN 63	[illegible]
C		CHANGE IN ACCORDANCE WITH MXC 188181		25 JUL 63	CAM
D		CHANGE IN ACCORDANCE WITH MXC 88467		5 AUG 63	[illegible]
E		CHANGE IN ACCORDANCE WITH MXC 89012 REVISED PER TDRR 03730		4 SEPT 63	[illegible]
F		CHANGE IN ACCORDANCE WITH MXC 189395		25 OCT 63	GFK
G		CHANGE IN ACCORDANCE WITH MXC 89848		12 NOV 63	GFK
H		CHANGE IN ACCORDANCE WITH MXC 89984		13 NOV 63	GFK
J		CHANGE IN ACCORDANCE WITH MXC 190368		13 NOV 63	GFK
K		CHANGE IN ACCORDANCE WITH MXC 192373 REVISED PER TDR 8851		25 NOV 63	[illegible]
L		CHANGE IN ACCORDANCE WITH CM 193991 REVISED PER TDRR 09394		7 FEB 64	[illegible]
M		REPLACED WITH CHANGE BY REV N PER TDRR 18664		MAY 65	[illegible]

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 51118 DATE 5-1-63

Ⓜ REPLACED WITH CHANGE BY REV N

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
					1	TBA	POWER SUPPLY MODEL SR-28-20MOD

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049	[illegible]	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4-3-63
CHECKED W. Diehl 8 APR 63
APPROVAL E. Rakin Ap. 8, 1963
APPROVAL [illegible] 10 APR 63
NASA APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

POWER SUPPLY,
RELAY AND LAMP

CODE IDENT NO
SIZE E
1900023
SCALE 1:2
SHEET

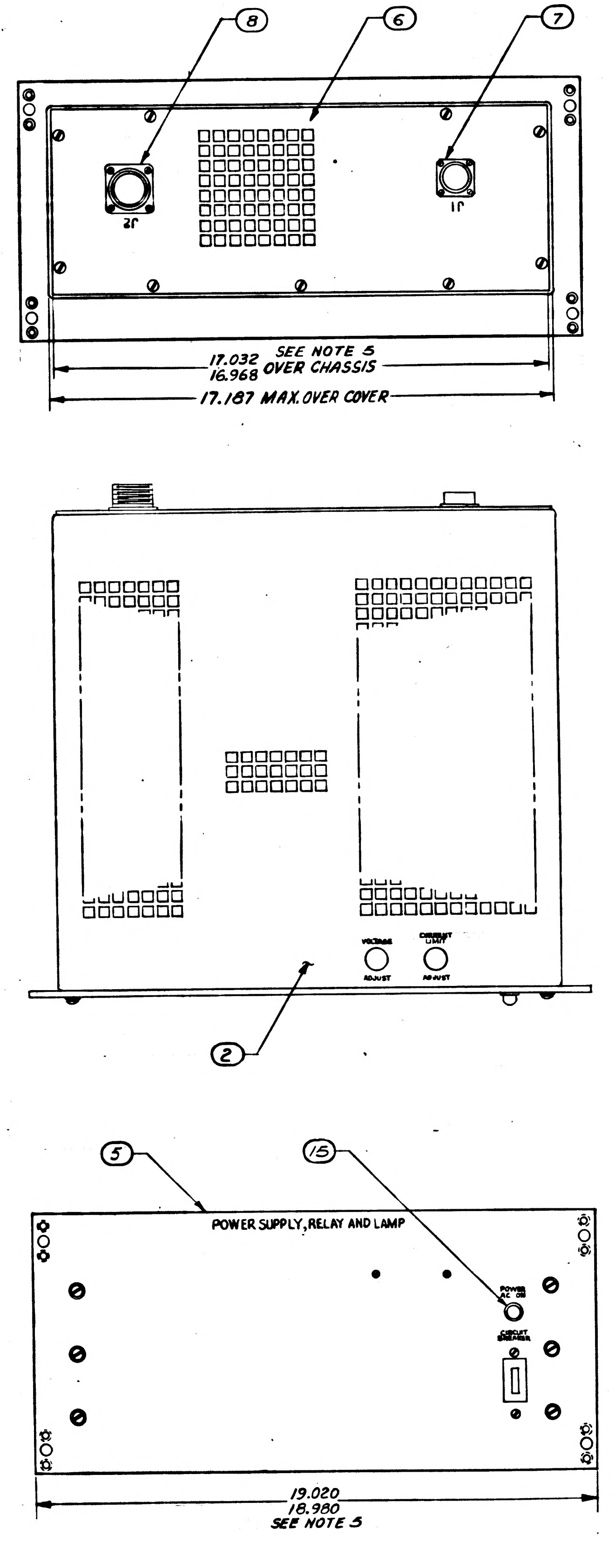
1900023
M
B

REQUIREMENTS:

1. DC OUTPUT:
   - A. VOLTAGE: 28 VDC NOMINAL, ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL
   - B. CURRENT: OUTPUT RANGE 0-25 AMP.
   - C. VOLTAGE RESOLUTION: ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 75 MV.
2. REGULATION: COMBINED, LESS THAN 1% OF MAXIMUM OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD, OR FULL LOAD TO NO LOAD, COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC, OR FROM 125 TO 105 VAC.
3. RIPPLE: LESS THAN 1% (RMS) OF MAXIMUM OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE AND LOAD CURRENT.
4. OUTPUT IMPEDANCE: .05 OHM MAX. DC TO 100 CPS, 0.5 OHM MAX. 100 CPS TO 10 KC, MEASURED AT POWER SUPPLY CONNECTOR J2.
5. RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.
6. OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.
7. TURN-ON, TURN-OFF OVERSHOOT: 0.75 V MAX.
8. TEMPERATURE COEFFICIENT: 0.1% MAX. PER DEGREE C.
9. OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.
10. ISOLATION: POWER INPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER. POWER OUTPUT SHALL HAVE EACH LINE CONNECTED INTERNALLY TO THE CHASSIS THROUGH A 2 MF CAPACITOR.
11. INSTRUCTION MANUALS: TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A PARTS LIST, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.
12. THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900023.
13. WEIGHT: MUST NOT EXCEED 105 LBS.
14. SHORT CIRCUIT PROTECTION REQD. CURRENT LIMITING MUST BE ADJUSTABLE FROM LESS THAN 50% TO AT LEAST 100% OF RATED FULL LOAD CURRENT.

NOTES:

1. INTERPRET DRAWINGS IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.
3. MOUNT NUT ⑳ FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8" SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
4. BORDER AREA WITHIN .56 INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE COPLANAR AND FREE OF PROTRUSIONS.
5. THE 17 INCH AND 19 INCH DIMENSIONS OF CHASSIS AND PANEL TO BE CENTRALIZED AT ASSEMBLY WITHIN .020 INCH. CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIM. MUST BE PARALLEL WITHIN .062 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 IN SHADED AREA DEFINED ON SIDES OF POWER SUPPLY.
6. THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.
7. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND BEYOND THE OUTSIDE SURFACE OF THE POWER SUPPLY COVER.
8. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.



SEE NOTE 8

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REV. WITH CHANGE PER TDRR 18664		15 Aug 65	

Ⓝ REPLACES REV(M) WITH CHANGE

QUANTITY REQUIRED				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				X		21	1901709	SCHEMATIC DIAGRAM
				6		20	1015798-010	NUT, ANCHOR
				2		19	-160	STANDOFF, INSUL.
				12		18	-131	RIVET, FLAT HD.
				3		17	-119	LUG, SOLDER
				1		16	-117	LOCK, SHAFT
				1		15	-031	PILOT LIGHT
				1		14	-029	SEMICONDUCTOR-DIODE
				1		13	-093	
				1		12	-079	
				1		11	-086	RESISTOR
				5		10	-010	CAPACITOR
				2		9	1901701-007	CAPACITOR
				1		8	MS3102E-22-5S	CONNECTOR, ELECT (190[illegible]-04[illegible])
				1		7	MS3112E-16-8P	CONNECTOR, ELECT (190[illegible]-044)
				1		6	1901756	PLATE, REAR
				1		5	1901708	PANEL, FRONT
				1		4	1901707	BRACKET
				1		3	1901706	BRACKET, MOUNTING (POT)
				1		2	1901705	COVER
				1		1	1901704	POWER SUPPLY, TRANSISTORIZED

LIST OF MATERIALS OR PARTS LIST

N	N
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049	1900004	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. KILYINGER DATE 2 JUN 64
CHECKED [illegible] 9 SEP 64
APPROVAL [illegible] 9 Oct [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

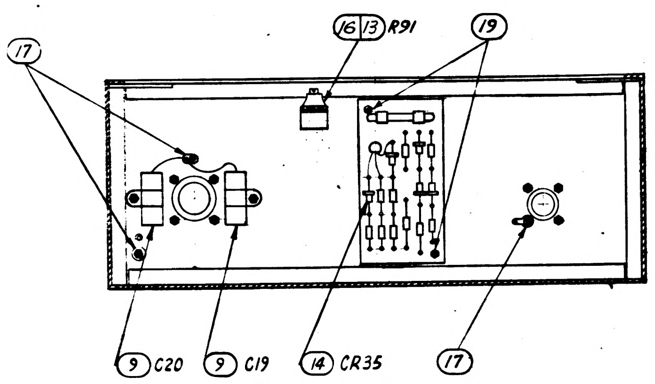
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
RELAY AND LAMP
ALTERED COMMERCIAL ITEM

CODE IDENT NO. 99974
E
1900023
SCALE 1:2
SHEET 1 OF 2

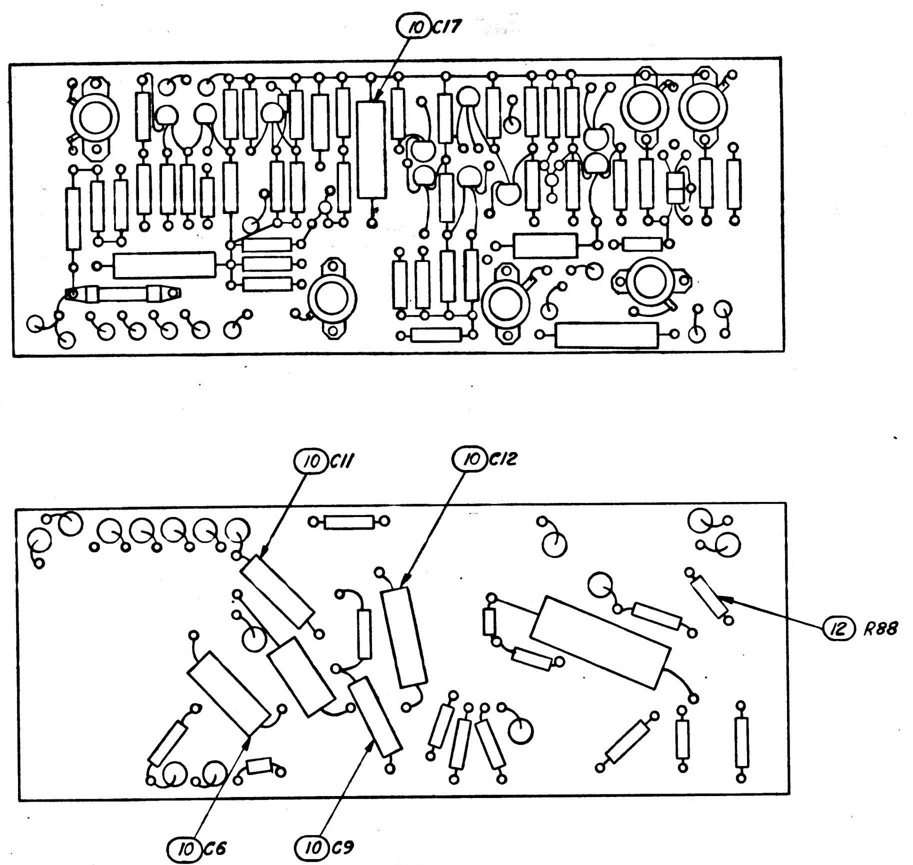
1900023

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		THIS SHEET ADDED PER TDRR 18664			



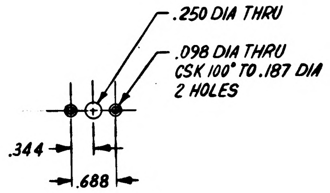
17
16
13
R91
19
9 C20
9 C19
14 CR35
17

SECTION A-A



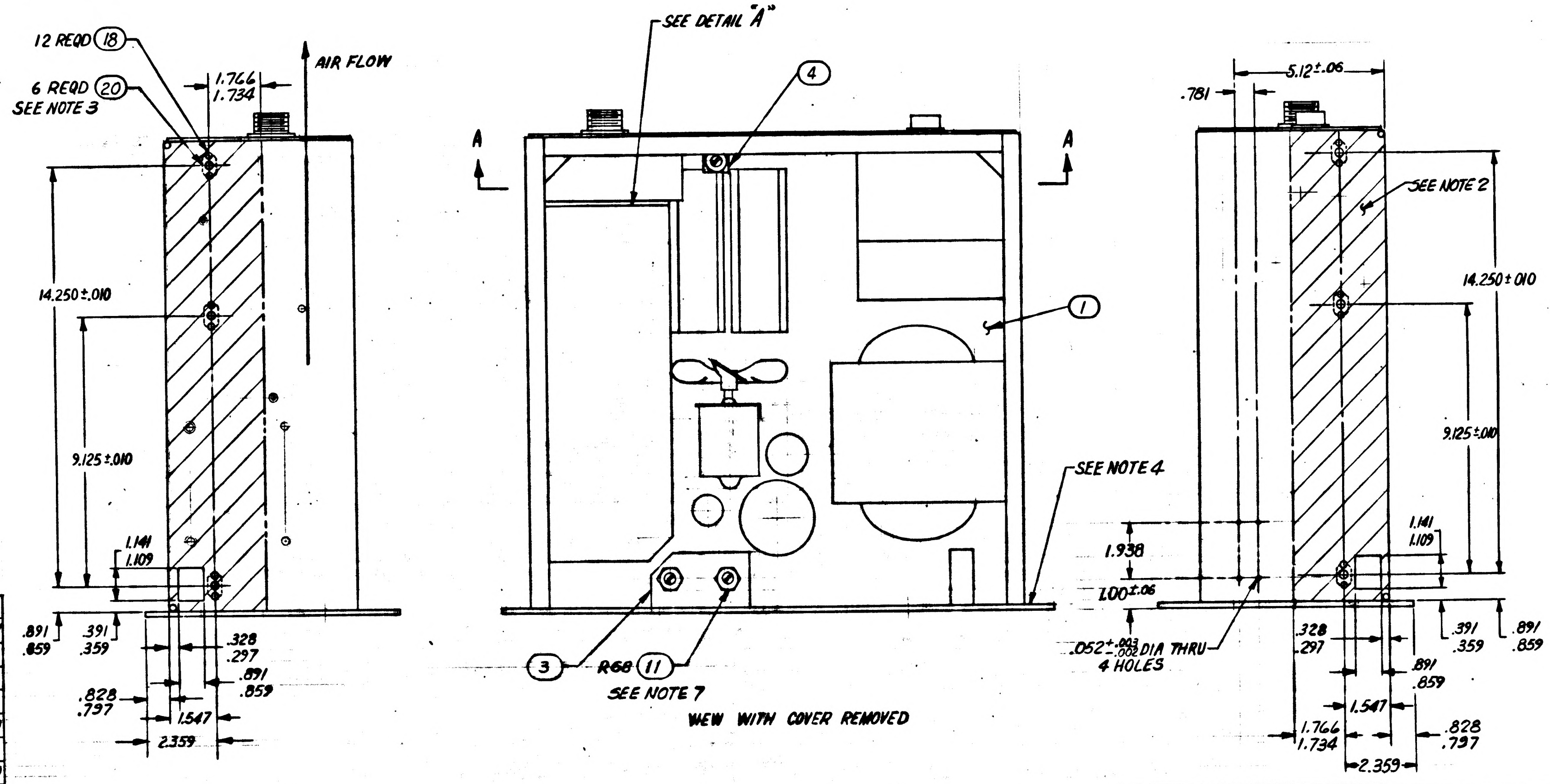
10 C17
10 C11
10 C12
12 R88
10 C6
10 C9

DETAIL "A"
SCALE: FULL



.250 DIA THRU
.098 DIA THRU
CSK 100° TO .187 DIA
2 HOLES
.344
.688

CLUSTER "A"
6 PLACES
SCALE: FULL



12 REQD 18
6 REQD 20
SEE NOTE 3
1.766
1.734
AIR FLOW
14.250±.010
9.125±.010
1.141
1.109
.891
.859
.391
.359
.328
.297
.891
.859
.828
.797
1.547
2.359
SEE DETAIL "A"
4
A
A
1
SEE NOTE 4
3
R68
11
SEE NOTE 7
VIEW WITH COVER REMOVED
5.12±.06
.781
SEE NOTE 2
14.250±.010
9.125±.010
1.141
1.109
1.938
1.00±.06
.052 +.003 -.002 DIA THRU
4 HOLES
.328
.297
.391
.359
.891
.859
.891
.859
1.547
1.766
1.734
.828
.797
2.359

PARTS MODIFIED

TRYGON PART NO	DESCRIPTON
E3357	CHASSIS

PARTS REMOVED

SYM	DESCRIPTION	SYM	DESCRIPTION
M1	VOLTMETER, 50 VOLTS	R83	POT 150Ω 1/2W
M2	AMMETER, 30 AMPS	D2630	COVER
R67	POT 1800Ω, 4 W	C2623	FRONT PANEL
R84	METER SHUNT	C2586	REAR PLATE
440Y8	BARRIER STRIP	2101-04-00	SOLDER LUG 4-40
B2230	COVER, INPUT	2101-08-00	SOLDER LUG 8-32
B2231	COVER, OUTPUT	2101-14-00	SOLDER LUG 1/4-20
A1399	BLOCK, INPUT	B224-B-0632-4	STAND OFF 1 1/4
A1398	BLOCK, OUTPUT		
5428	HANDLES		
4656	STUDS, BRASS (5)		
BH2096M	FEET (4)		

Ⓝ THIS SHEET ADDED

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049	1900004	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —
DECIMALS ± .005
ANGLES ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Kilvinger DATE 2 JUNE 64
Neal Beuslan 10 Sep 64
CHECKED
APPROVAL Pesknuc 9 Oct 64
APPROVAL Gelman 4/27/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
RELAY AND LAMP
ALTERED COMMERCIAL ITEM

CODE IDENT NO. 99974
SIZE E
1900023
SCALE 1:2
SHEET 2 OF 2

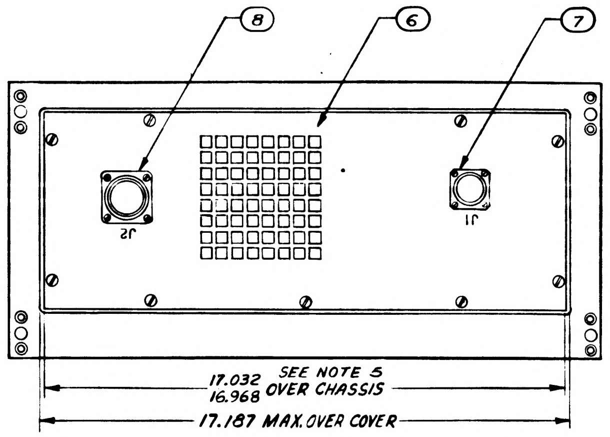
1900023 N

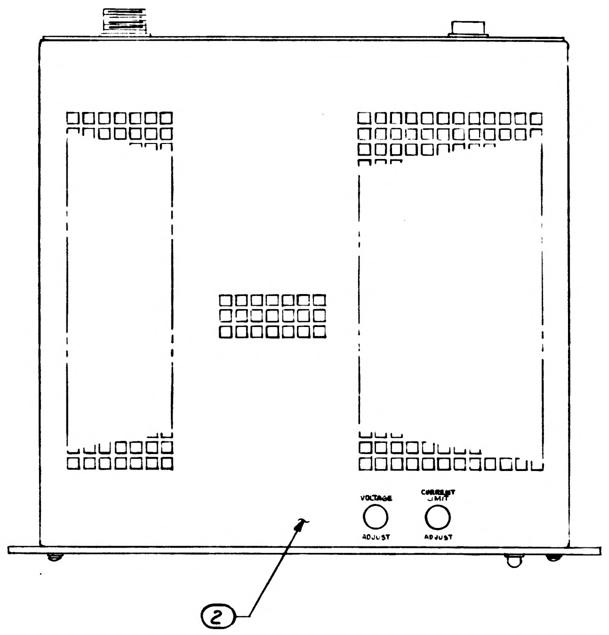
REQUIREMENTS:

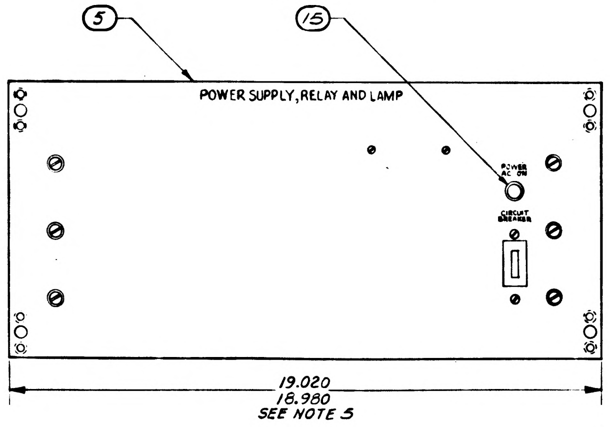
1. DC OUTPUT:
   - A. VOLTAGE: 28 VDC NOMINAL, ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL
   - B. CURRENT: OUTPUT RANGE 0-25 AMP.
   - C. VOLTAGE RESOLUTION: ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 75 MV.
2. REGULATION: COMBINED, LESS THAN 1% OF MAXIMUM OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD, OR FULL LOAD TO NO LOAD, COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC, OR FROM 125 TO 105 VAC.
3. RIPPLE: LESS THAN 1% (RMS) OF MAXIMUM OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE AND LOAD CURRENT.
4. OUTPUT IMPEDANCE: .05 OHM MAX. DC TO 100 CPS, 0.5 OHM MAX. 100 CPS TO 10 KC, MEASURED AT POWER SUPPLY CONNECTOR J2.
5. RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.
6. OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.
7. TURN-ON, TURN-OFF OVERSHOOT: 0.75 V MAX.
8. TEMPERATURE COEFFICIENT: 0.1% MAX. PER DEGREE C.
9. OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.
10. ISOLATION: POWER INPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER. POWER OUTPUT SHALL HAVE EACH LINE CONNECTED INTERNALLY TO THE CHASSIS THROUGH A 2 MF CAPACITOR.
11. INSTRUCTION MANUALS: TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A PARTS LIST, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.
12. THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900023.
13. WEIGHT: MUST NOT EXCEED 105 LBS.
14. SHORT CIRCUIT PROTECTION REQD. CURRENT LIMITING MUST BE ADJUSTABLE FROM LESS THAN 50% TO AT LEAST 100% OF RATED FULL LOAD CURRENT.
15. OVER VOLTAGE PROTECTION: APPLIES ONLY TO -021 ASSEMBLY. UNIT SHALL CONTAIN A PROTECTIVE CIRCUIT WHICH SHALL PREVENT AN OUTPUT VOLTAGE OF 33 VOLTS OR GREATER, CAUSED BY A POWER SUPPLY REGULATOR FAILURE OR AN EXTERNALLY APPLIED VOLTAGE.

NOTES:

1. INTERPRET DRAWINGS IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.
3. MOUNT NUT ⑳ FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8" SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
4. BORDER AREA WITHIN .56 INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE COPLANAR AND FREE OF PROTRUSIONS.
5. THE 17 INCH AND 19 INCH DIMENSIONS OF CHASSIS AND PANEL TO BE CENTRALIZED AT ASSEMBLY WITHIN .020 INCH. CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIM. MUST BE PARALLEL WITHIN .062 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 IN SHADED AREA DEFINED ON SIDES OF POWER SUPPLY.
6. THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.
7. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND BEYOND THE OUTSIDE SURFACE OF THE POWER SUPPLY COVER.
8. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.







Ⓝ REPLACES REV (M) WITH CHANGE

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REV. M WITH CHANGE PER TDRR 18664		15 Jan 65	
P		REVISED PER TDRR 19185	—	22 MAY 65	

SEE NOTES 8 & 15

021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
X	X		22	ATP 1900023	TEST PROCEDURE FOR POWER SUPPLY, RELAY AND LAMP
-	X		21	1901709	SCHEMATIC DIAGRAM
6	6		20	1015798-010	NUT, ANCHOR
2	2		19	-160	STANDOFF, INSUL.
12	12		18	-131	RIVET, FLAT HD.
3	3		17	-119	LUG, SOLDER
1	1		16	-117	LOCK, SHAFT
1	1		15	-031	PILOT LIGHT
1	1		14	-029	SEMICONDUCTOR-DIODE
1	1		13	-093	
1	1		12	-079	
1	1		11	-086	RESISTOR
5	5		10	-010	CAPACITOR
2	2		9	1901701-007	CAPACITOR
1	1		8	MS3102E-22-5S	CONNECTOR, ELECT (1901701-041)
1	1		7	MS3112E-16-8P	CONNECTOR, ELECT (1901701-044)
1	1		6	1901756	PLATE, REAR
1	1		5	1901708	PANEL, FRONT
1	1		4	1901707	BRACKET
1	1		3	1901706	BRACKET, MOUNTING (POT)
1	1		2	1901705	COVER
1	1		1	1901704	POWER SUPPLY, TRANSISTORIZED

QUANTITY REQUIRED — LIST OF MATERIALS OR PARTS LIST

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049-031		-021
1900049-021	1901976-011	-011
1900049-011	1900004-021	-011
1900049-011	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. KILLINGER DATE 2 JUN 64
CHECKED 3 SEP 64
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

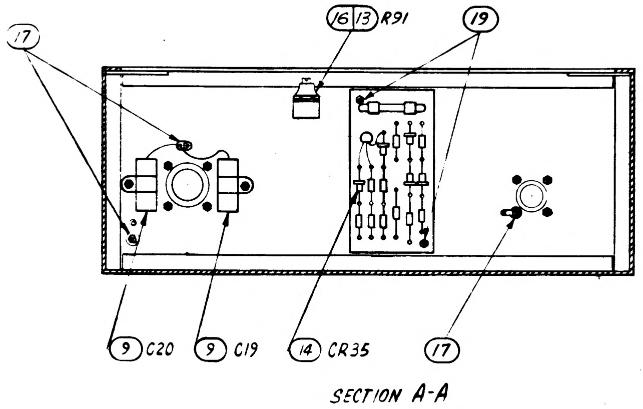
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
RELAY AND LAMP
ALTERED COMMERCIAL ITEM

CODE IDENT NO 99974 E 1900023
SCALE 1:2 SHEET 1 OF 2

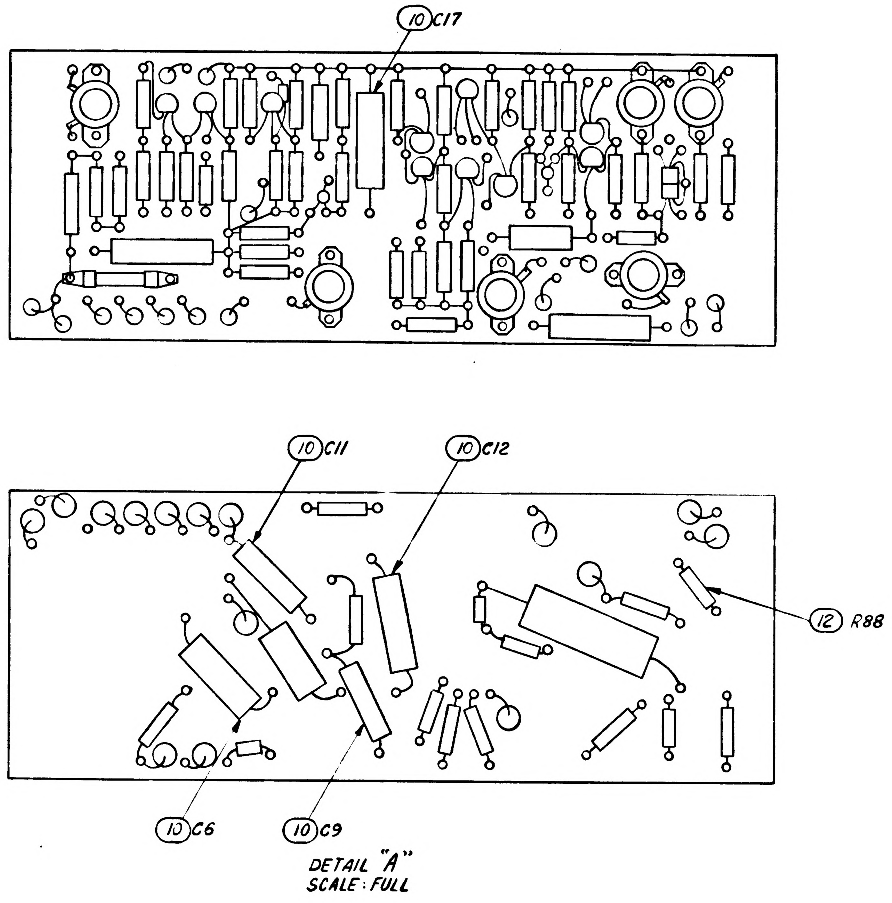
1900023

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		THIS SHEET ADDED PER TDRR 18664		65	
P		REVISED PER TDRR 19185	—	22 MAY 65	



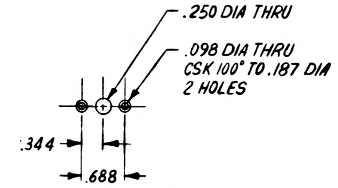
17
16 13 R91
19
9 C20
9 C19
14 CR35
17

SECTION A-A



10 C17
10 C11
10 C12
12 R88
10 C6
10 C9

DETAIL "A"
SCALE: FULL



.250 DIA THRU
.098 DIA THRU
CSK 100° TO .187 DIA
2 HOLES
.344
.688

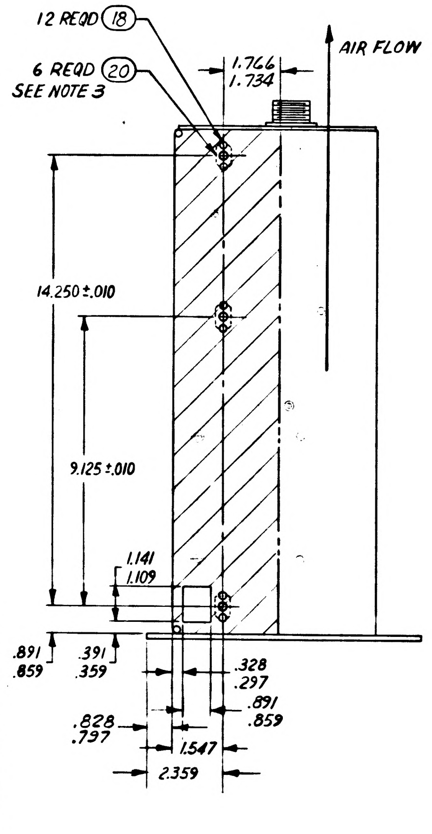
CLUSTER "A"
6 PLACES
SCALE: FULL

PARTS MODIFIED

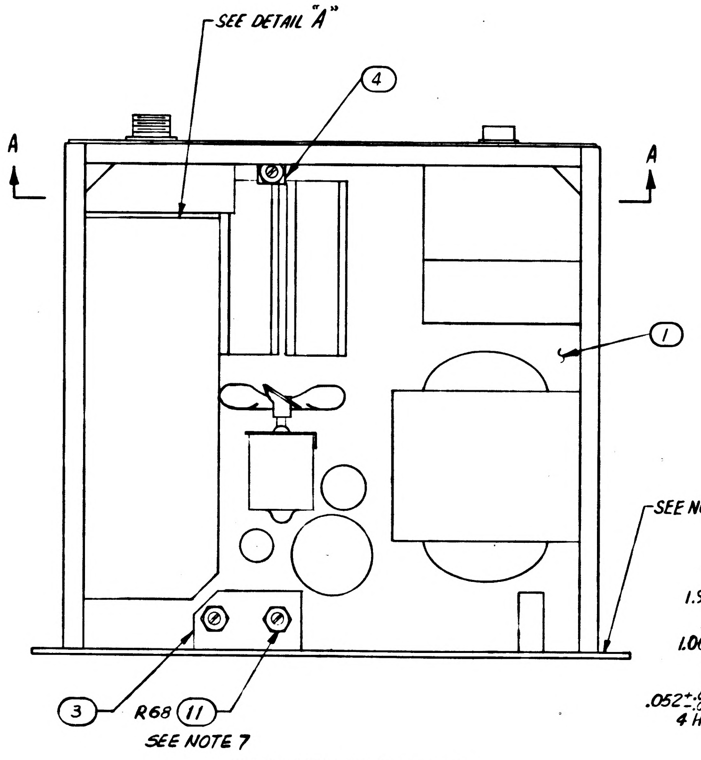
TRYGON PART NO	DESCRIPTON
E3357	CHASSIS

PARTS REMOVED

SYM	DESCRIPTION	SYM	DESCRIPTION
M1	VOLTMETER, 50 VOLTS	R83	POT 150Ω 1/2W
M2	AMMETER, 30 AMPS	D2630	COVER
R67	POT 1800Ω, 4W	C2623	FRONT PANEL
R84	METER SHUNT	C2586	REAR PLATE
440Y8	BARRIER STRIP	2101-04-00	SOLDER LUG 4-40
B2230	COVER, INPUT	2101-08-00	SOLDER LUG 8-32
B2231	COVER, OUTPUT	2101-14-00	SOLDER LUG 1/4-20
A1399	BLOCK, INPUT	8224-B-0632-4	STAND OFF 1 1/4
A1398	BLOCK, OUTPUT		
5428	HANDLES		
4656	STUDS, BRASS (5)		
BH20%N	FEET (4)		

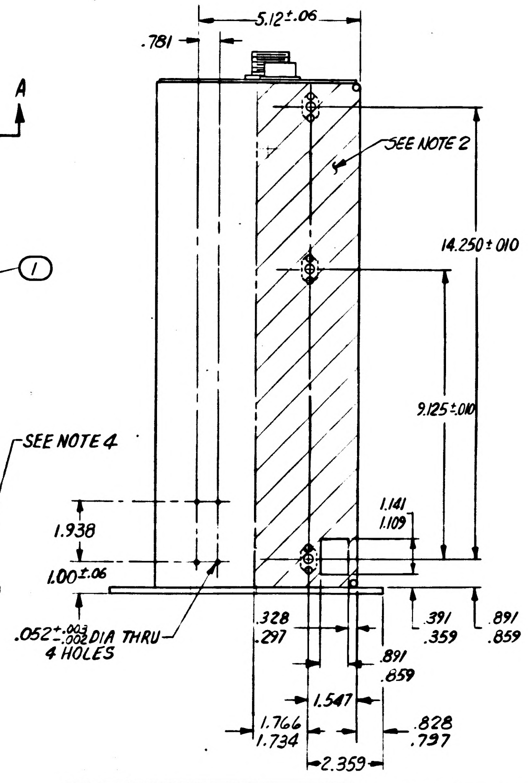


12 REQD 18
6 REQD 20
SEE NOTE 3
AIR FLOW
1.766
1.734
14.250±.010
9.125±.010
1.141
1.109
.891
.859
.391
.359
.328
.297
.891
.859
.828
.797
1.547
2.359



SEE DETAIL "A"
4
A
A
1
SEE NOTE 4
3
R68 11
SEE NOTE 7

VIEW WITH COVER REMOVED



5.12±.06
.781
SEE NOTE 2
14.250±.010
9.125±.010
1.141
1.109
1.938
1.00±.06
.052+.003 -.002 DIA THRU
4 HOLES
.328
.297
.391
.359
.891
.859
.891
.859
1.547
1.766
1.734
.828
.797
2.359

Ⓝ THIS SHEET ADDED

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049-031		-021
1900049-021	1901976-011	-011
1900049-011	1900004-021	-011
1900049-011	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .005 ANGLES ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Kilvinger DATE 2 JUNE 64
CHECKED 10 SEP 64
APPROVAL Pokorny 4 OCT 64
APPROVAL Feldman 4-7-65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
RELAY AND LAMP
ALTERED COMMERCIAL ITEM

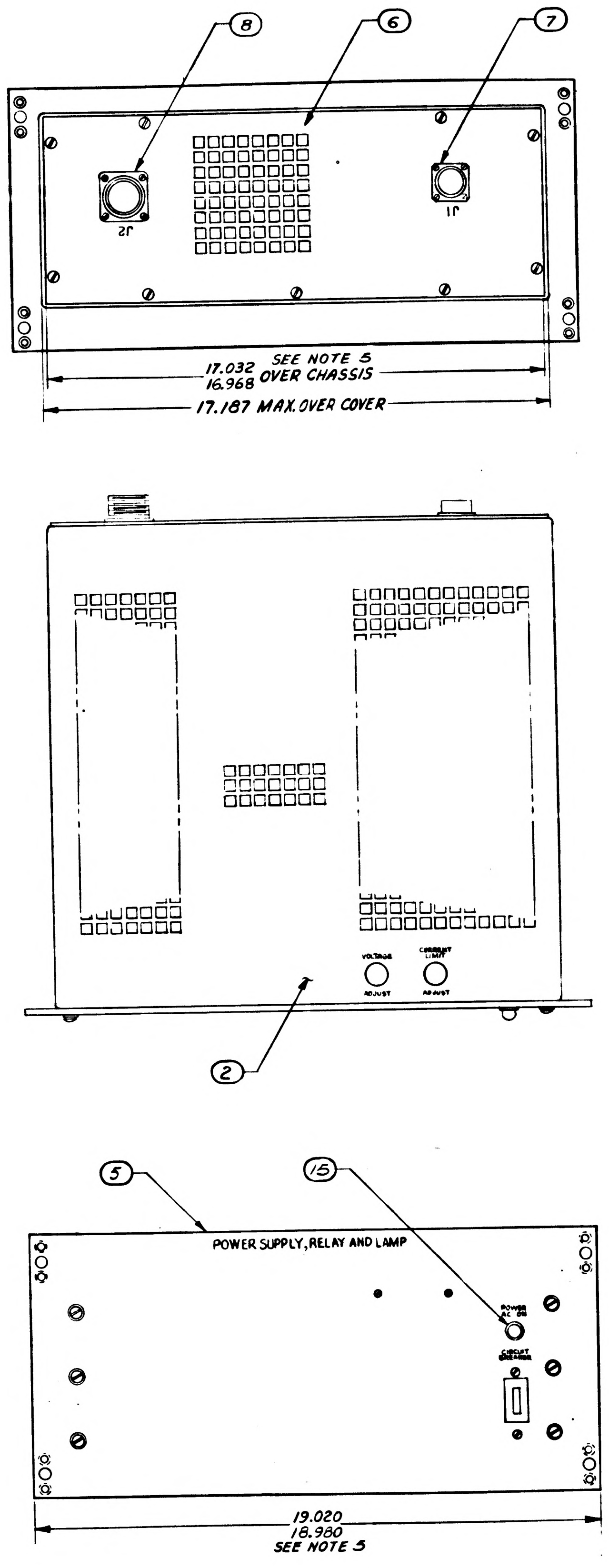
CODE IDENT NO 99974
SIZE E
1900023
SCALE 1:2
SHEET 2 OF 2

REQUIREMENTS:

1. DC OUTPUT:
   - A. VOLTAGE: 28 VDC NOMINAL, ±10% MINIMUM ADJUSTMENT CAPABILITY FROM NOMINAL
   - B. CURRENT: OUTPUT RANGE 0-25 AMP.
   - C. VOLTAGE RESOLUTION: ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 75 MV.
2. REGULATION: COMBINED, LESS THAN 1% OF MAXIMUM OUTPUT VOLTAGE FOR A LOAD CHANGE FROM NO LOAD TO FULL LOAD, OR FULL LOAD TO NO LOAD, COMBINED WITH AN INPUT LINE CHANGE FROM 105 TO 125 VAC. OR FROM 125 TO 105 VAC.
3. RIPPLE: LESS THAN 1% (RMS) OF MAXIMUM OUTPUT VOLTAGE FOR ANY COMBINATION OF LINE VOLTAGE, OUTPUT VOLTAGE AND LOAD CURRENT.
4. OUTPUT IMPEDANCE: .05 OHM MAX DC TO 100 CPS, 0.5 OHM MAX. 100 CPS TO 10 KC, MEASURED AT POWER SUPPLY CONNECTOR J2.
5. RECOVERY TIME: 20 MILLISECONDS TO RETURN TO WITHIN 100 MV OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD AND FULL LOAD TO HALF LOAD.
6. OVERSHOOT: LESS THAN 2 VOLTS FROM NO LOAD TO FULL LOAD.
7. TURN-ON, TURN-OFF OVERSHOOT: 0.75 V MAX.
8. TEMPERATURE COEFFICIENT: 0.1% MAX. PER DEGREE C.
9. OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.
10. ISOLATION: POWER INPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER. POWER OUTPUT SHALL HAVE EACH LINE CONNECTED INTERNALLY TO THE CHASSIS THROUGH A 2 MF CAPACITOR.
11. INSTRUCTION MANUALS: TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A PARTS LIST, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.
12. THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900023.
13. WEIGHT: MUST NOT EXCEED 105 LBS.
14. SHORT CIRCUIT PROTECTION REQD. CURRENT LIMITING MUST BE ADJUSTABLE FROM LESS THAN 50% TO AT LEAST 100% OF RATED FULL LOAD CURRENT.
15. OVER VOLTAGE PROTECTION: APPLIES ONLY TO -021 ASSEMBLY. UNIT SHALL CONTAIN A PROTECTIVE CIRCUIT WHICH SHALL PREVENT AN OUTPUT VOLTAGE OF 33 VOLTS OR GREATER, CAUSED BY A POWER SUPPLY REGULATOR FAILURE OR AN EXTERNALLY APPLIED VOLTAGE.

NOTES:

1. INTERPRET DRAWINGS IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. THE PANEL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.
3. MOUNT NUT ⑳ FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8" SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
4. BORDER AREA WITHIN .56 INCH OF THE PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE COPLANAR AND FREE OF PROTRUSIONS.
5. THE 17 INCH AND 19 INCH DIMENSIONS OF CHASSIS AND PANEL TO BE CENTRALIZED AT ASSEMBLY WITHIN .020 INCH. CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, 1/2 INCH FROM BACK SIDE OF FRONT PANEL, AND 1/2 INCH FROM BOTTOM SURFACE OF CHASSIS. SIDES OF CHASSIS LOCATED BY 17 INCH DIM. MUST BE PARALLEL WITHIN .062 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 IN SHADED AREA DEFINED ON SIDES OF POWER SUPPLY.
6. THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.
7. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND BEYOND THE OUTSIDE SURFACE OF THE POWER SUPPLY COVER.
8. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.



SEE NOTES 8 & 15

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REV. M WITH CHANGE PER TDRR 8664		[illegible]	[illegible]
P		REVISED PER TDRR 19185	—	22 MAY 65	[illegible]
R		REPLACED WITH CHANGE BY REV. S PER TDRR 23710		[illegible] 65	[illegible]

Ⓝ REPLACES REV(M) WITH CHANGE

Ⓡ REPLACED WITH CHANGE BY REV Ⓢ

QUANTITY REQUIRED			EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	021	011				
	X	X		22	ATP 1900023	TEST PROCEDURE FOR POWER SUPPLY, RELAY AND LAMP
	-	X		21	1901709	SCHEMATIC DIAGRAM
	6	6		20	1015798-010	NUT, ANCHOR
	2	2		19	-160	STANDOFF, INSUL.
	12	12		18	-131	RIVET, FLAT HD.
	3	3		17	-119	LUG, SOLDER
	1	1		16	-117	LOCK, SHAFT
	1	1		15	-031	PILOT LIGHT
	1	1		14	-029	SEMICONDUCTOR-DIODE
	1	1		13	-093	
	1	1		12	-079	
	1	1		11	-086	RESISTOR
	5	5		10	-010	CAPACITOR
	2	2		9	1901701-007	CAPACITOR
	1	1		8	MS3102E-22-5S	CONNECTOR, ELECT (190[illegible]-041)
	1	1		7	MS3112E-16-8P	CONNECTOR, ELECT (190[illegible]-044)
	1	1		6	1901756	PLATE, REAR
	1	1		5	1901708	PANEL, FRONT
	1	1		4	1901707	BRACKET
	1	1		3	1901706	BRACKET, MOUNTING (POT)
	1	1		2	1901705	COVER
	1	1		1	1901704	POWER SUPPLY, TRANSISTORIZED

LIST OF MATERIALS OR PARTS LIST

1900023

APPLICATION		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049-031		-021
1900049-021	1901976-011	-011
1900049-011	1900004-021	-011
1900049-011	1900004-011	-011

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

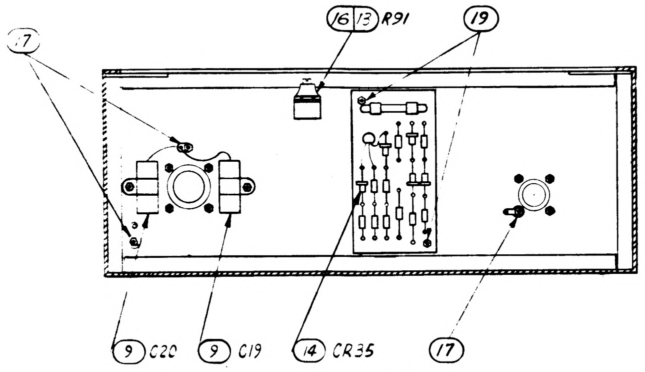
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. KILVINGER DATE 2 JUN 64
CHECKED [illegible] 9 SEP 64
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
RELAY AND LAMP
ALTERED COMMERCIAL ITEM

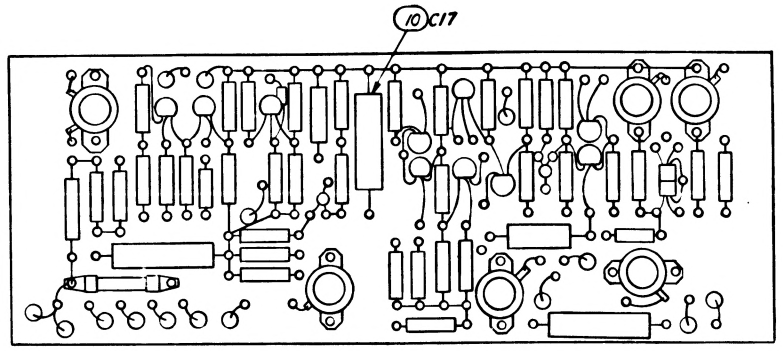
CODE IDENT NO 99974
E
1900023
SCALE 1:2
SHEET 1 OF 2

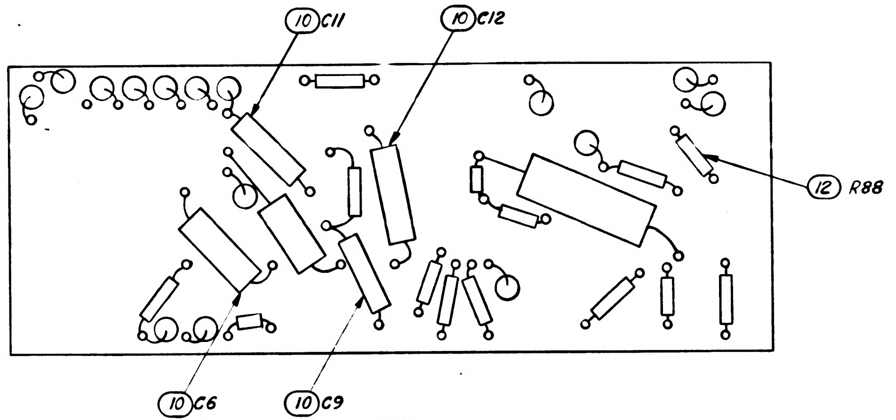
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		THIS SHEET ADDED PER TDRR 18007			
P		REVISED PER TDRR 19185	—	22 MAY 65	
R		REPLACED WITH CHANGE BY REV. S PER TDRR 23410		2 NOV 65	WP RWM



17
16 13 R91
19
9 C20
9 C19
14 CR35
17

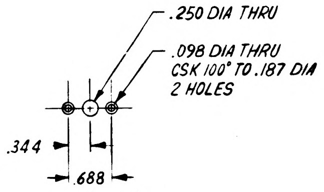
SECTION A-A





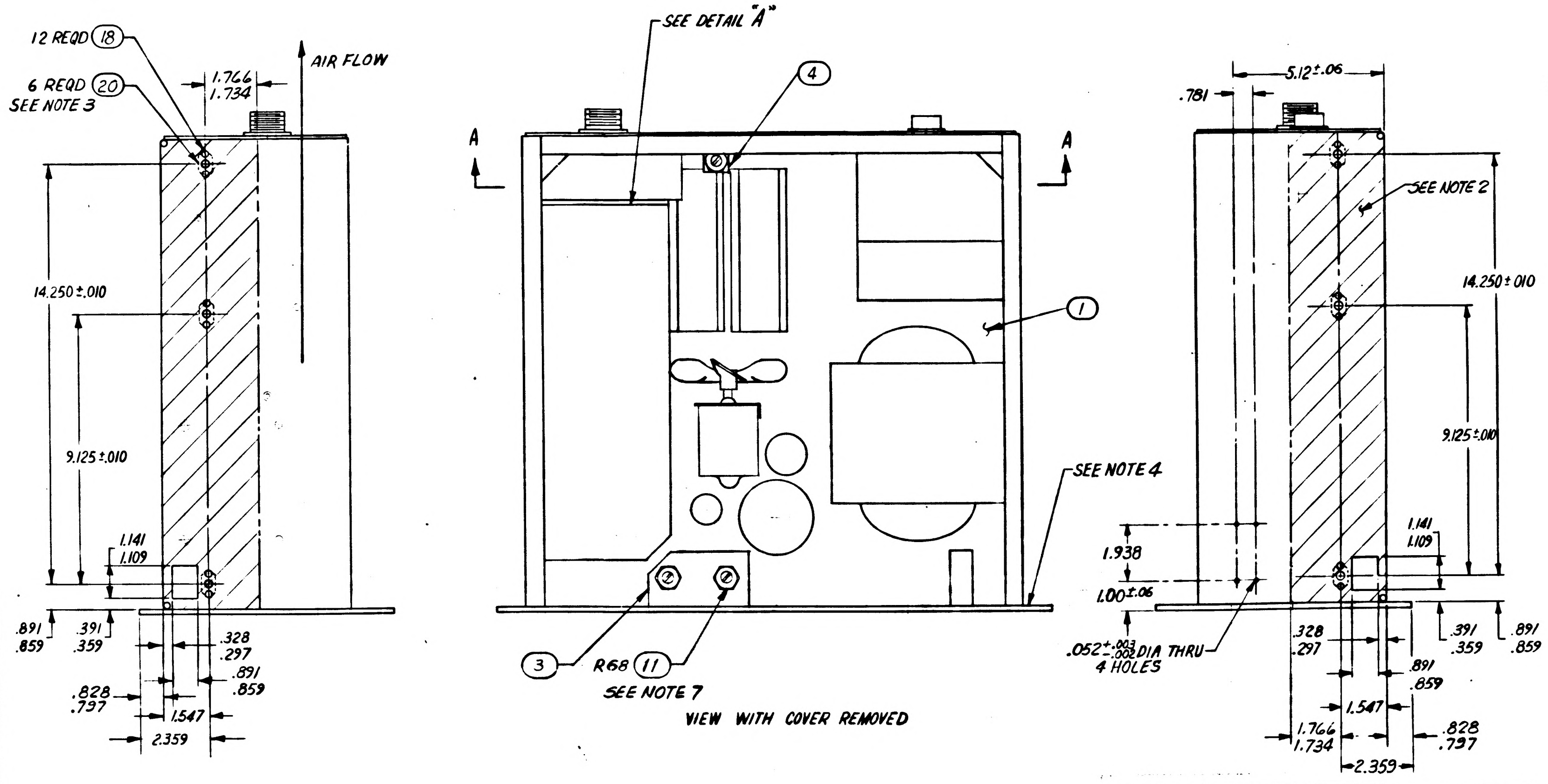
10 C11
10 C12
12 R88
10 C6
10 C9

DETAIL "A"
SCALE: FULL



.250 DIA THRU
.098 DIA THRU CSK 100° TO .187 DIA 2 HOLES
.344
.688

CLUSTER "A"
6 PLACES
SCALE: FULL



12 REQD 18
6 REQD 20
SEE NOTE 3
1.766
1.734
AIR FLOW
14.250±.010
9.125±.010
1.141
1.109
.891
.859
.391
.359
.328
.297
.891
.859
.828
.797
1.547
2.359
SEE DETAIL "A"
4
A
A
1
SEE NOTE 4
3
R68 11
SEE NOTE 7
5.12±.06
.781
SEE NOTE 2
14.250±.010
9.125±.010
1.141
1.109
1.938
1.00±.06
.052 +.003 -.002 DIA THRU 4 HOLES
.328
.297
.391
.359
.891
.859
.891
.859
1.547
1.766
1.734
.828
.797
2.359

VIEW WITH COVER REMOVED

Ⓡ REPLACED WITH CHANGE BY REV Ⓢ

PARTS MODIFIED

TRYGON PART NO	DESCRIPTON
E3357	CHASSIS

PARTS REMOVED

SYM	DESCRIPTION	SYM	DESCRIPTION
M1	VOLTMETER, 50 VOLTS	R83	POT 150Ω 1/2W
M2	AMMETER, 30 AMPS	D2630	COVER
R67	POT 1800Ω, 4W	C2623	FRONT PANEL
R84	METER SHUNT	C2586	REAR PLATE
440Y8	BARRIER STRIP	2101-04-00	SOLDER LUG 4-40
B2230	COVER, INPUT	2101-08-00	SOLDER LUG 8-32
B2231	COVER, OUTPUT	2101-14-00	SOLDER LUG 1/4-20
A1399	BLOCK, INPUT	8224-B-0632-4	STAND OFF 1 1/4
A1398	BLOCK, OUTPUT		
5428	HANDLES		
4656	STUDS, BRASS (5)		
BH2096W	FEET (4)		

Ⓝ THIS SHEET ADDED

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900049-031		-021
1900049-021	1901976-011	-011
1900049-011	1900004-021	-011
1900049-011	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .005 ANGLES ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

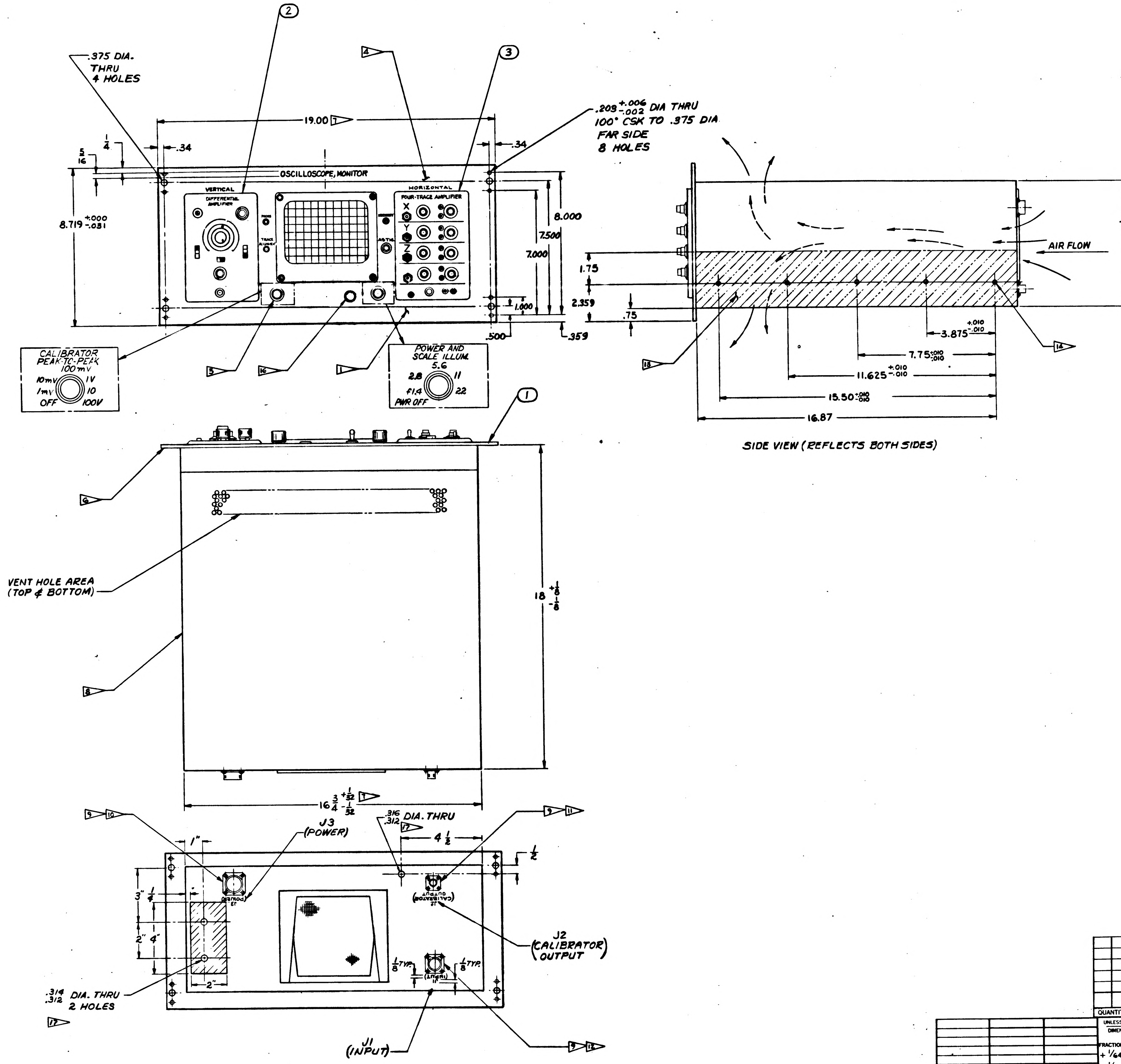
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Kilvinger DATE 2 JUNE 64
CHECKED 10 Sep 64
APPROVAL Perkins 9 Oct 64
APPROVAL Felman 4-7-65
NASA APPROVAL
MIT APPROVAL 27 Jan 65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
RELAY AND LAMP
ALTERED COMMERCIAL ITEM

CODE IDENT NO 99974
SIZE E
1900023
SCALE 1:2
SHEET 2 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
A		CHANGED IN ACCORDANCE WITH MXC 187183		6-19 63	
B		CHANGED IN ACCORDANCE WITH MXC 88562. PER TDRR 03873			W. C.



.375 DIA. THRU 4 HOLES
19.00
.34
.34
$\frac{1}{4}$
$\frac{5}{16}$
.203 +.006 -.002 DIA THRU 100° CSK TO .375 DIA FAR SIDE 8 HOLES
OSCILLOSCOPE, MONITOR
VERTICAL
DIFFERENTIAL AMPLIFIER
HORIZONTAL
FOUR-TRACE AMPLIFIER
X
Y
Z
8.719 +.000 -.031
8.000
7.500
7.000
1.000
.500
.359
CALIBRATOR PEAK-TO-PEAK 100mV
10mV
1V
1mV
10
OFF
100V
POWER AND SCALE ILLUM.
5.6
2.8
11
f1.4
22
PWR OFF
1
2
3
4
5
6
7
7 $^{+\frac{1}{16}}_{-\frac{1}{16}}$
1.75
2.359
.75
AIR FLOW
3.875 +.010 -.010
7.75 ±.010
11.625 +.010 -.010
15.50 ±.010
16.87
SIDE VIEW (REFLECTS BOTH SIDES)
VENT HOLE AREA (TOP & BOTTOM)
18 $^{+\frac{1}{8}}_{-\frac{1}{8}}$
16 $\frac{3}{4}$ $^{+\frac{1}{32}}_{-\frac{1}{32}}$
.316 .312 DIA. THRU
4 $\frac{1}{2}$
$\frac{1}{2}$
1"
J3 (POWER)
3" $\frac{1}{4}$
2" 4"
2"
J2 (CALIBRATOR) OUTPUT
$\frac{1}{8}$ TYP.
$\frac{1}{8}$ TYP.
.314 .312 DIA. THRU 2 HOLES
J1 (INPUT)
9
10
11
12
13
14
15
16
17

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00949 DATE 24 Apr 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1		3	1900025	AMPLIFIER, FOUR-TRACE
			1		2	1900028	AMPLIFIER, DIFFERENTIAL
			1		1		INDICATOR UNIT, RM 561 (MOD)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900038	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + 1/64 − 1/64
DECIMALS + 15 −
ANGLES + − − −
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44287-A
DRAWN W. MUNSON DATE 3 APR 63
CHECKED W. Buehl 4 APR 63
APPROVAL GEO. J. PESKURIC
APPROVAL 4 APR 63
NASA APPROVAL 4/24/63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR

CODE IDENT NO | SIZE E | 1900024
SCALE | SHEET 1 OF 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		CHANGED IN ACCORDANCE WITH MXC 187183		6-3 65	
B		CHANGED IN ACCORDANCE WITH MXC 188562 PER TDRR 03873		6 4-3 63	

REQUIREMENTS:

HORIZONTAL INPUT AMPLIFIER (FOUR TRACE) – P/N 1900025

(a) VOLTAGE SENSITIVITY – 20 mv/cm TO 10 v/cm, WITH A MAX. DISPLAY ERROR OF 3%

(b) FREQUENCY dc TO 30 KC.

(c) INPUT IMPEDANCE – 1 MEGOHM OR GREATER.

(d) CAPABLE OF DISPLAYING 4 INPUT SIGNALS INDIVIDUALLY, IN PAIRS, OR ALL AT ONE TIME THROUGH ELECTRONIC SWITCHING.

VERTICAL INPUT AMPLIFIER (DIFFERENTIAL) – P/N 1900028

(a) VOLTAGE SENSITIVITY – 20 mv/cm TO 10 v/cm, WITH A MAX. DISPLAY ERROR OF 3%

(b) FREQUENCY – dc TO 30 KC.

(c) INPUT IMPEDANCE – 1 MEGOHM OR GREATER.

(d) DIFFERENTIAL INPUT

POWER – 105 TO 125 V, 60 CPS, ±5 cps. APPROX. 210 WATTS

NET WEIGHT: 41 LBS APPROX.

THIS INSTRUMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900024.

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATIONS SHALL BE SUPPLIED FOR EACH OSCILLOSCOPE AND PLUG IN AMPLIFIER. ALSO A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

THE POWER SOURCE SHALL BE ELECTRICALLY ISOLATED FROM CHASSIS AND ALL OTHER INPUTS.

INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

1▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. FINISH PAINT TO BE TWO COATS OF TT-E-529A, CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595
NOTE: MIL-P-8585 SUPERCEDES MIL-P-6889 PRIMER.

2▷ CHARACTERS APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS PER ND-1002019 PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157, EXCEPT WHEN CONTRASTING COLOR NEEDED FOR COLOR CODING. CHARACTER STYLE TO BE FUTURA DEMI-BOLD PER ND-1002122 OR SIMILAR EXCEPT WHERE OTHERWISE SPECIFIED THE CHARACTER HEIGHT ($\frac{1}{8}$ INCH PREFERRED) AND LOCATIONS SHALL BE DETERMINED BY THE SUPPLIER.

3▷ KNOBS SHALL BE PER MS-91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE.

4▷ FRONT PANEL MATERIAL SHALL BE $\frac{3}{16}$ ALUMINUM 5052-H32 (THIS EXCLUDES PLUG-IN AMPLIFIER PANELS).

6▷ BORDER AREA – WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANER AND FREE OF PROTRUSIONS.

7▷ $16\frac{3}{4}$ AND 19.00 INCH DIMENSIONS OF CHASSIS AND FRONT PANEL SHALL BE CENTRALIZED WITHIN .020 AT ASSEMBLY.

8▷ SIDES OF CHASSIS LOCATED BY $16\frac{3}{4}$ INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.

9▷ EXACT CONNECTOR LOCATIONS ON REAR OF CHASSIS TO BE DETERMINED BY SUPPLIER. RECOMMENDED CLEARANCE OF $1\frac{1}{2}$ INCHES OR GREATER BETWEEN ADJACENT CONNECTORS. CONNECTORS SHALL BE IDENTIFIED ABOVE RECEPTACLE AS SHOWN. MARKING OF REFERENCE DESIGNATIONS AND CONNECTOR IDENTIFICATION CHARACTERS SHALL BE APPLIED PER ND-1002019.

10▷ POWER INPUT CONNECTOR MS-3112E16-8P (J3)

PIN	CONNECT TO
A	CHASSIS
B,C	OPEN
D	POWER HI
E	POWER LO
F,G,H	OPEN

11▷ CALIBRATOR OUTPUT UG1094/U (J2)

12▷ INPUT CONNECTOR (J1) MS-3112E-14-19P

PIN	CONNECT TO
A	OPEN
B	CHANNEL 1 HI
C	CHANNEL 1 LO (CHASSIS)
D	CHANNEL 2 HI
E	PLUS DIFFERENTIAL INPUT LO
F	PLUS DIFFERENTIAL INPUT HI
G	NEGATIVE DIFFERENTIAL INPUT HI
H	NEGATIVE DIFFERENTIAL INPUT LO
J	OPEN
K	CHANNEL 3 HIGH
L	CHANNEL 4 LO (CHASSIS)
M	CHANNEL 4 HI
N	OPEN
P	OPEN
R	CHANNEL 2 LO (CHASSIS)
S	OPEN
T	OPEN
U	CHANNEL 3 LO (CHASSIS)
V	OPEN

ALL SCOPE INPUTS SHALL BE ON THE BACK PANEL. THIS REQUIRES WIRING FROM THE BACK PANEL TO THE PLUG-IN AMPLIFIERS. THIS WIRING SHOULD PASS THRU SUITABLE CONNECTORS SO THAT THE PLUG-IN UNITS MAY BE REMOVED WITHOUT ACCESS TO THE INSIDE OF THE OSCILLOSCOPE CABINET. THE OSCILLOSCOPE SHALL RETAIN THE CAPABILITY OF OPERATING WITH CONVENTIONAL FRONT INPUT PLUG-IN AMPLIFIERS DESIGNED FOR THE 561 AND 565 TETROX OSCILLOSCOPE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

13▷ EXTERNAL SURFACE OF CHASSIS WITHIN SLIDE MOUNTING AREA (SHADED AREA) MUST BE FREE OF PROTRUSIONS.

14▷ INSTALL FLOATING ANCHOR NUT 1015798-010 OR EQUIVALENT FROM THE INSIDE SURFACE OF THE CHASSIS. (10 REQD)

INDICATOR UNIT, DIFFERENTIAL AMPLIFIER 1900028, AND FOUR TRACE AMPLIFIER 1900025 SHALL BE COMPATIBLE WITH EACH OTHER. THEY SHALL BE COMBINED AND TESTED AS ONE UNIT.

THE EQUIPMENT SHALL BE MADE SO THAT, WITH SUITABLE CHANGE OF THE INPUT CONNECTIONS AND BY INTERCHANGING THE TWO PLUG-IN AMPLIFIERS, THE DISPLAY WILL HAVE THE VERTICAL AND HORIZONTAL AXES INTERCHANGED.

15▷ UNLESS OTHERWISE SPECIFIED:
DECIMAL TOLERANCES AS FOLLOWS –
$.000\ ^{+.005}_{-.005}$
$.00\ ^{+.02}_{-.02}$

16▷ POWER ON INDICATOR LAMP SHALL HAVE A GREEN LENS.

17▷ IN THE INDICATED AREA, $\frac{1}{2}$ INCH CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACES. THERE SHALL BE NO PROTRUSIONS IN THIS AREA ON THE EXTERNAL SURFACES OF THE PANEL.

DATA SOURCE:

TEKTRONIX, INC.
PORTLAND, OREGON

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900038		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44287-A
DRAWN W. MUNSON DATE 3 APR 63
CHECKED W. Diehl 4 APR 63
APPROVAL Geo. Peskuric
APPROVAL 4 APR 63
NASA APPROVAL 4-22-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR

CODE IDENT NO. SIZE E 1900024
SCALE — SHEET 2 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD

REQUIREMENTS:

HORIZONTAL INPUT AMPLIFIER (FOUR TRACE) –

(a) VOLTAGE SENSITIVITY – 20 mV/cm TO 10 V/cm, 3% ACCURACY.

(b) FREQUENCY dc TO 30 KC.

(c) INPUT IMPEDANCE – 1 MEGOHM OR GREATER.

(d) CAPABLE OF DISPLAYING 4 INPUT SIGNALS INDIVIDUALLY, IN PAIRS, OR ALL AT ONE TIME THROUGH ELECTRONIC SWITCHING.

VERTICAL INPUT AMPLIFIER (DIFFERENTIAL) –

(a) VOLTAGE SENSITIVITY – 20 mV/cm TO 10 V/cm, 3% ACCURACY.

(b) FREQUENCY – dc TO 30 KC.

(c) INPUT IMPEDANCE – 1 MEGOHM OR GREATER.

(d) DIFFERENTIAL INPUT

POWER – 105 TO 125 V, 60 CPS, ±5 cps.

NET WEIGHT: 41 LBS APPROX.

THIS INSTRUMENT SHALL PASS ALL TESTS CALLED OUT IN (ES-   ) ND-

THIS INSTRUMENT SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATIONS SHALL BE SUPPLIED FOR EACH OSCILLOSCOPE AND PLUG IN AMPLIFIER. ALSO A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.

THE SUPPLIER'S NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

THE POWER SOURCE SHALL BE ELECTRICALLY ISOLATED FROM CHASSIS AND ALL OTHER INPUTS.

1▷ APPLY TO FRONT AND EDGES OF FRONT PANEL MIL-P-8585 PRIMER AND TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595. (ES-2621, CLASS B).

2▷ CHARACTERS APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS. PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157 PER 1002019, EXCEPT WHEN CONTRASTING COLOR NEEDED FOR COLOR CODING. CHARACTER STYLE TO BE FUTURA DEMI-BOLD OR SIMILAR. EXCEPT WHERE OTHERWISE SPECIFIED THE CHARACTER HEIGHT AND LOCATIONS SHALL BE DETERMINED BY THE SUPPLIER.

3▷ KNOBS SHALL BE PER MS-91528 TYPE F AND K WHERE PRACTICAL. ALL KNOBS SHALL BE FLAT BLACK EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE.

4▷ FRONT PANEL MATERIAL SHALL BE QQ-A-318, TEMPER H-32 AL ALY, $\frac{3}{16}$ THK. (THIS EXCLUDES PLUG-IN AMPLIFIER PANELS).

6▷ BORDER AREA – WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANER AND FREE OF PROTRUSIONS.

ENTIRE REAR SURFACE OF FRONT PANEL SHALL BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

7▷ $16\frac{3}{4}$ AND 19.00 INCH DIMENSIONS OF CHASSIS AND FRONT PANEL SHALL BE CENTRALIZED WITHIN .020 AT ASSEMBLY.

8▷ SIDES OF CHASSIS LOCATED BY $16\frac{3}{4}$ INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.

9▷ EXACT CONNECTOR LOCATIONS ON REAR OF CHASSIS TO BE DETERMINED BY SUPPLIER. CONNECTORS SHALL BE IDENTIFIED ABOVE RECEPTACLE AS SHOWN.

10▷ POWER INPUT CONNECTOR MS-3112E 16-8P (J3)

PIN	CONNECT TO
A	CHASSIS
B, C	OPEN
D	POWER, HI
E	POWER, LO
F, G, H	OPEN

11▷ CALIBRATOR OUTPUT UG 1094/U (J2)

12▷ INPUT CONNECTOR (J1) MS-3112E-14-19P

PIN	CONNECT TO
A	OPEN
B	CHANNEL 1 HI
C	CHANNEL 1 LO (CHASSIS)
D	CHANNEL 2 HI
E	CHASSIS
F	PLUS DIFFERENTIAL INPUT
G	NEGATIVE DIFFERENTIAL INPUT
H	OPEN
J	CHASSIS
K	CHANNEL 3 HIGH
L	CHANNEL 4 LO (CHASSIS)
M	CHANNEL 4 HI
N	CHASSIS
P	CHASSIS
R	CHANNEL 2 LO (CHASSIS)
S	CHASSIS
T	OPEN
U	CHANNEL 3 LO (CHASSIS)
V	OPEN

ALL SCOPE INPUTS SHALL BE ON THE BACK PANEL. THIS REQUIRES WIRING FROM THE BACK PANEL TO THE PLUG-IN AMPLIFIERS. THIS WIRING SHOULD PASS THRU SUITABLE CONNECTORS SO THAT THE PLUG-IN UNITS MAY BE REMOVED WITHOUT ACCESS TO THE INSIDE OF THE OSCILLOSCOPE CABINET. THE OSCILLOSCOPE SHALL RETAIN THE CAPABILITY OF OPERATING WITH A CONVENTIONAL PLUG-IN UNIT HAVING FRONT INPUT CONNECTORS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

13▷ EXTERNAL SURFACE OF CHASSIS WITHIN SLIDE MOUNTING AREA (SHADED AREA) MUST BE FREE OF PROTRUSIONS.

14▷ INSTALL FLOATING ANCHOR NUT 7901674-010 OR EQUIVALENT FROM THE INSIDE SURFACE OF THE CHASSIS. (10 REQD)

INDICATOR UNIT 1900051, DIFFERENTIAL AMPLIFIER 1900028, AND FOUR TRACE AMPLIFIER 1900025 SHALL BE SUPPLIED AND TESTED AS ONE UNIT.

THE EQUIPMENT SHALL BE MADE SO THAT, WITH SUITABLE CHANGE OF THE INPUT CONNECTIONS AND BY INTERCHANGING THE TWO PLUG-IN AMPLIFIERS, THE DISPLAY WILL HAVE THE VERTICAL AND HORIZONTAL AXES INTERCHANGED.

15▷ UNLESS OTHERWISE SPECIFIED:
DECIMAL TOLERANCES AS FOLLOWS –
$.000\ ^{+.005}_{-.005}$
$.00\ ^{+.02}_{-.02}$

DATA SOURCE:

TEKTRONIX, INC.
PORTLAND, OREGON

1900024

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900038		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

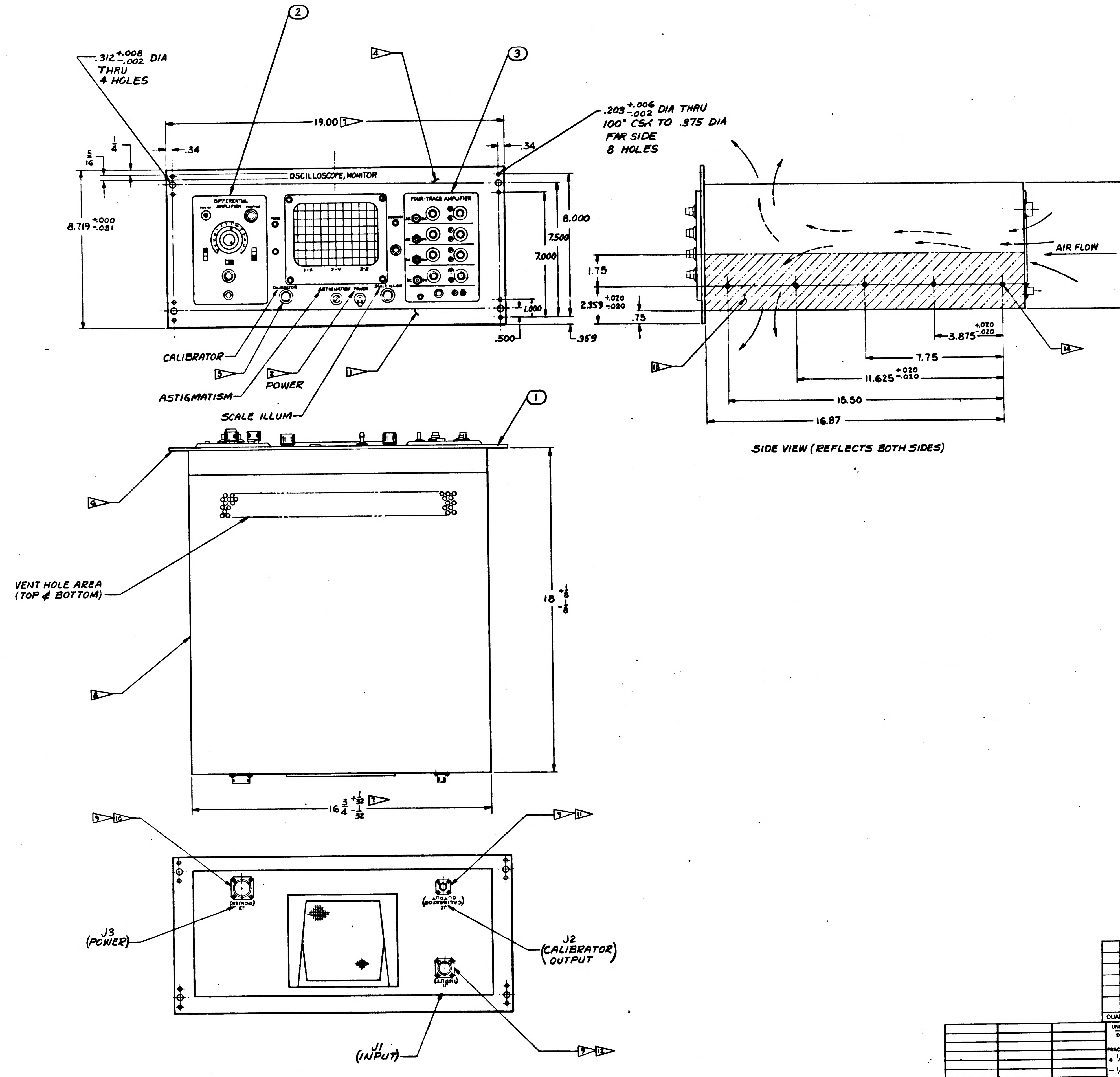
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44287-A
DRAWN W. MUNSON DATE 3 APR 63
CHECKED W. Diehl 4 APR 63
APPROVAL Geo. Fiskoric
APPROVAL 4 APR 63
NASA APPROVAL 6-20-63
INIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR

CODE IDENT NO
SIZE E
1900024
SCALE —
SHEET 2 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD



2
3
4
.312 +.008 −.002 DIA THRU 4 HOLES
19.00 7
.34
.34
5/16
1/4
8.719 +.000 −.031
OSCILLOSCOPE, MONITOR
DIFFERENTIAL AMPLIFIER
FOUR-TRACE AMPLIFIER
CALIBRATOR
ASTIGMATISM
POWER
SCALE ILLUM
8.000
7.500
7.000
1.000
.500
.359
.203 +.006 −.002 DIA THRU 100° CSK TO .375 DIA FAR SIDE 8 HOLES
CALIBRATOR
3
ASTIGMATISM
2
POWER
1
SCALE ILLUM
1.75
2.359 +.020 −.020
.75
AIR FLOW
7 +1/16 −1/16
3.875 +.020 −.020
7.75
11.625 +.020 −.020
15.50
16.87
18
14
SIDE VIEW (REFLECTS BOTH SIDES)
1
6
VENT HOLE AREA (TOP & BOTTOM)
18 +1/8 −1/8
8
16 3/4 +1/32 −1/32 7
9 10
9 11
J3 (POWER)
J2 (CALIBRATOR OUTPUT)
J1 (INPUT)
9 12

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00499 DATE 24 Apr. 63

			1		3	1900025	AMPLIFIER, FOUR-TRACE
			1		2	1900028	AMPLIFIER, DIFFERENTIAL
			1		1	1900051	INDICATOR UNIT, (RM 561 MOD)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900038		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + 1/64 − 1/64
DECIMALS ± 15
ANGLES ± −
DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44287-A
DRAWN W. MUNSON DATE 3 APR 63
CHECKED W. Buhl 4 APR 63
APPROVAL GEO J. PESKURIC
APPROVAL 4 APR 63
NASA APPROVAL 4-24-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE MONITOR

CODE IDENT NO
SIZE E
1900024
SCALE 1:2
SHEET

1900024

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
A	—	CHANGE IN ACCORDANCE WITH MXC 186761	—	23-MAY-63	L.J.E.L. / NEFS
B	—	CHANGE IN ACCORDANCE WITH MXC 189013 PER TDRR 03716	—	16 AUG 63	WSM / CAP
				8 Oct 63	W.K.

REQUIREMENTS:

VOLTAGE SENSITIVITY WHEN USED WITH OSCILLOSCOPE 1900024: 20 mV/CM TO 10V/CM WITH A MAX. DISPLAY ERROR OF 3%

FREQUENCY: dc TO 30KC.

INPUT IMPEDANCE: 1 MEGOHM OR GREATER.

CAPABLE OF DISPLAYING 4 INPUT SIGNALS INDIVIDUALLY, IN PAIRS, OR ALL AT ONE TIME THROUGH ELECTRONIC SWITCHING.

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PANEL. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

1 ▷ CONNECTION DESIGN FOR SIGNAL INPUTS FROM THE OSCILLOSCOPE INDICATOR UNIT TO THE PLUG-IN AMPLIFIER SHALL BE DETERMINED BY THE SUPPLIER. THE AMPLIFIER SHALL BE DESIGNED FOR USE IN EITHER OF THE CAVITIES OF THE MONITOR OSCILLOSCOPE 1900024. THERE SHALL BE NO CONNECTORS MOUNTED ON THE FRONT PANEL.

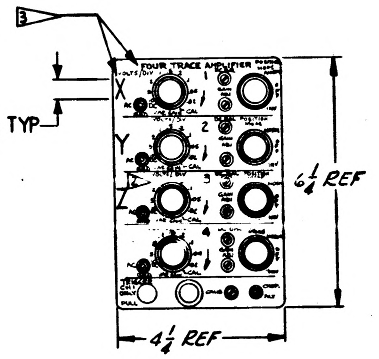
THIS AMPLIFIER, ALONG WITH A DIFFERENTIAL AMPLIFIER 1900028, WILL BE ASSEMBLED INTO A MONITOR OSCILLOSCOPE 1900024 AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT IN ATP 1900024.

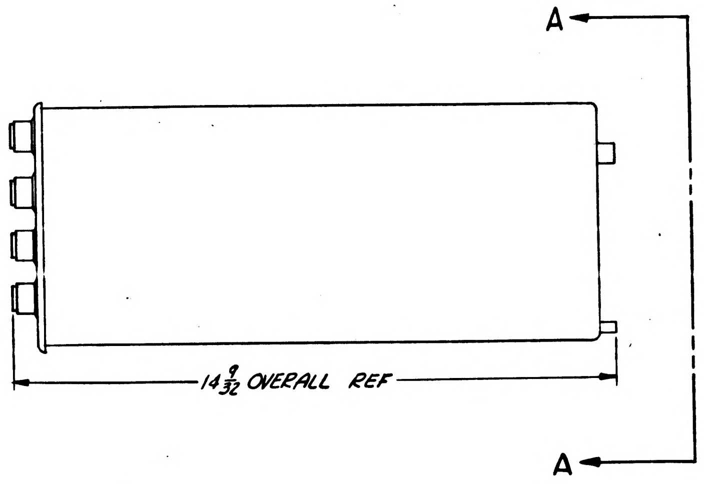
2 ▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595.

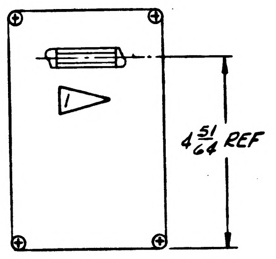
NOTE: MIL-P-8585 SUPERCEDES MIL-P-6889 PRIMER.

3 ▷ CHARACTERS APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS PER 1002019. PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157, EXCEPT WHEN CONTRASTING COLOR NEEDED FOR COLOR CODING. PREFERED CHARACTER STYLE TO BE FUTURA DEMI-BOLD [PER ND 1002122]. EXCEPT WHERE OTHERWISE SPECIFIED THE CHARACTER HEIGHT AND LOCATIONS SHALL BE DETERMINED BY THE SUPPLIER. CHARACTERS SHALL BE $\frac{1}{8}$" IN HEIGHT WHEREVER POSSIBLE. LOCATION OF CHANNEL IDENTIFICATION X, Y AND Z SHALL BE DETERMINED BY CENTRALIZING THE CHARACTERS IN THE AREA SHOWN.

THIS AMPLIFIER SHALL BE ELECTRICALLY AND MECHANICALLY COMPATIBLE FOR USE WITH OSCILLOSCOPE 19C0024.







VIEW "A-A"

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. D0999 DATE 24 Apr 63

DATA SOURCE:
TEKTRONIX, INC
PORTLAND, OREGON
FOUR-TRACE AMPLIFIER UNIT TYPE 3A74

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
						TO BE ASSIGNED	AMPLIFIER 4 TRACE (MODEL 3A74)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900024-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A. J. FLUDER DATE 3 APR 63
MALIKOWSKI 4 APR 63
CHECKED
Geo. J. Peskuric 4 APR 63
APPROVAL
APPROVAL 4 APR 63
NASA APPROVAL 4/24/63
J. P. 4-24-63
MIT APPROVAL W. Kupfer 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER
FOUR-TRACE

CODE IDENT NO.
SIZE D
1900025
SCALE —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10750-F

1900025

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO	DATE	APPD

REQUIREMENTS:

VOLTAGE SENSIVITY: 20 mV/CM TO 10V/CM 3% ACCURACY.

FREQUENCY: dc TO 30KC.

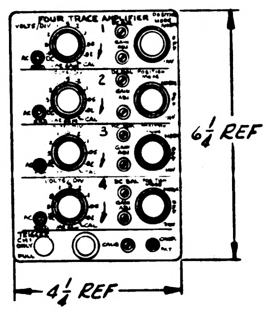
INPUT IMPEDANCE : 1 MEGOHM OR GREATER.

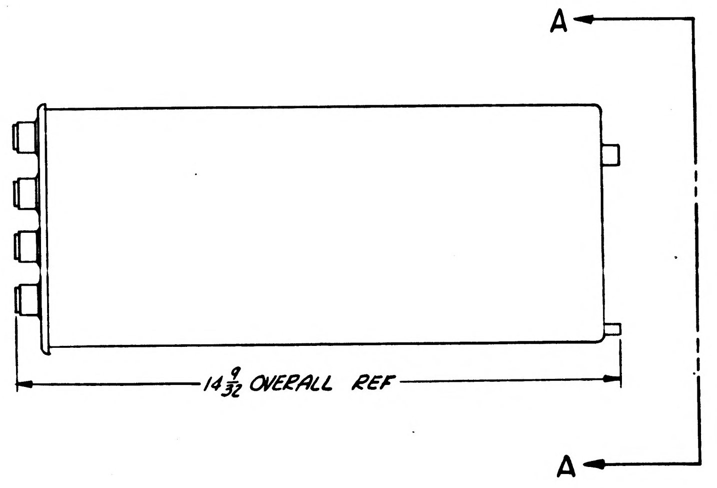
CAPABLE OF DISPLAYING 4 INPUT SIGNALS INDIVIDUALLY, IN PAIRS, OR ALL AT ONE TIME THROUGH ELECTRONIC SWITCHING.

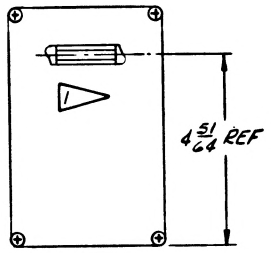
THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PANEL. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

1 CONNECTION DESIGN FOR SIGNAL INPUTS FROM THE OSCILLOSCOPE INDICATOR UNIT TO THE PLUG-IN AMPLIFIER SHALL BE DETERMINED BY THE SUPPLIER. THE AMPLIFIER SHALL BE DESIGNED FOR USE IN EITHER OF THE CAVITIES OF THE MONITOR OSCILLOSCOPE 1900024.

THIS AMPLIFIER, ALONG WITH A DIFFERENTIAL AMPLIFIER 1900028, WILL BE ASSEMBLED INTO A MONITOR OSCILLOSCOPE 1900024 AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT ON (ES) ND-







VIEW "A-A"

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

DATA SOURCE:
TEKTRONIX, INC
PORTLAND, OREGON
FOUR-TRACE AMPLIFIER UNIT TYPE 3A74.

							TO BE ASSIGNED	AMPLIFIER 4 TRACE (MODEL 3A74)
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900024-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — DECIMALS + — — ANGLES + — — —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A.J. Fluder DATE 3 APR 63
MALKOWSKI 4 APR 63
CHECKED
APPROVAL Geo. J. Peskuric 4 APR 63
APPROVAL 4 APR 63
NASA APPROVAL
P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

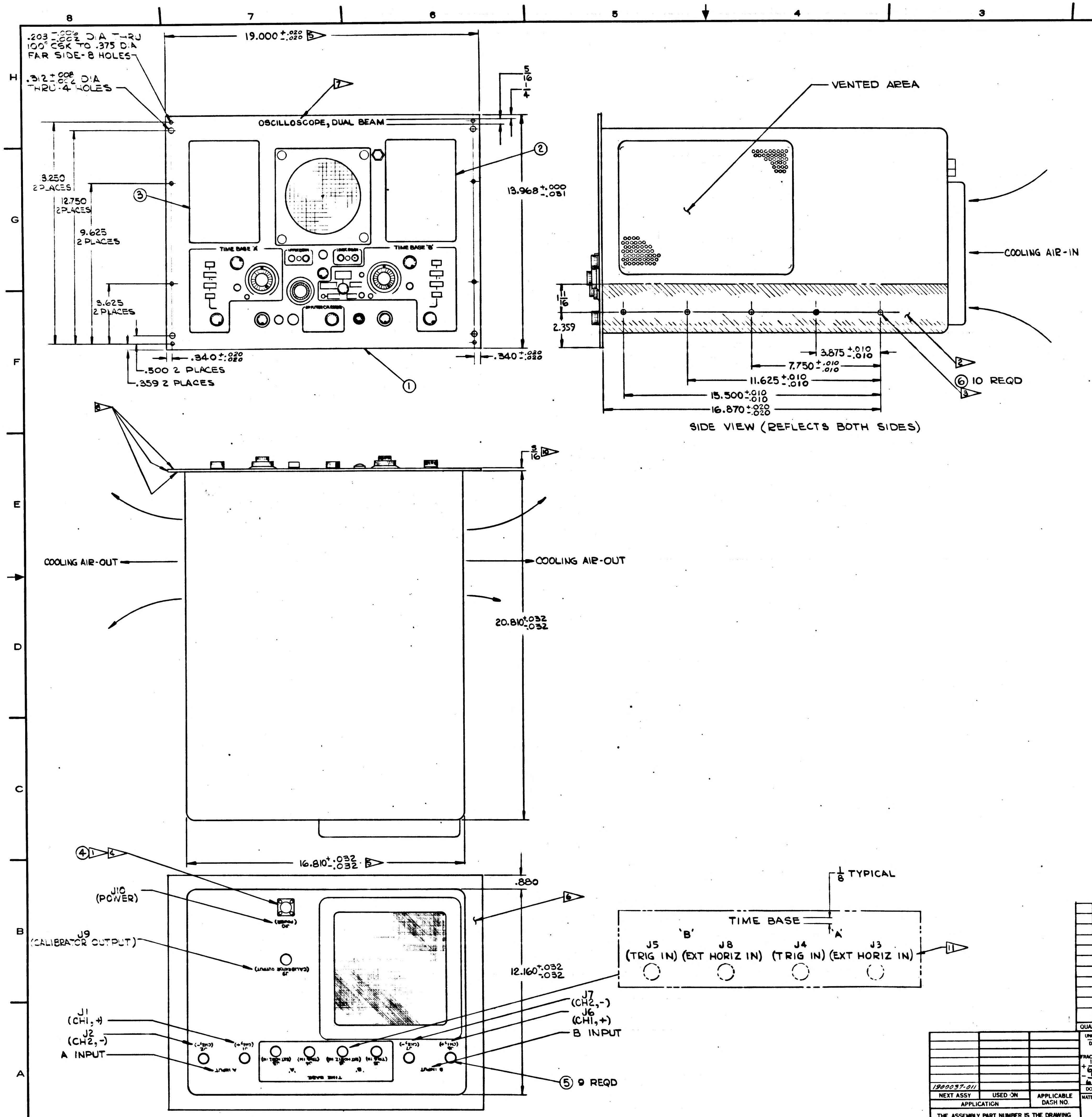
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER
FOUR-TRACE

CODE IDENT NO.
SIZE D
1900025
SCALE —
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
A1		A1 REVISED & REDESIGN		[illegible] 63	PTW
B1		B1 REVISED TOLERANCE & ITEM 6 WAS 7901674-010	—	7 APR 63	WS



.203 +.005 -.002 DIA THRU
100° CSK TO .375 DIA
FAR SIDE-8 HOLES
.312 +.005 -.002 DIA
THRU-4 HOLES
19.000 ±.020
5
7
OSCILLOSCOPE, DUAL BEAM
5/16
1/4
2
3
13.968 +.000 -.031
3.250
2 PLACES
12.750
2 PLACES
9.625
2 PLACES
3.625
2 PLACES
TIME BASE 'A'
TIME BASE 'B'
.340 ±.020
.340 ±.020
.500 2 PLACES
.359 2 PLACES
1
VENTED AREA
COOLING AIR-IN
1 1/16
2.359
3.875 +.010 -.010
7.750 +.010 -.010
11.625 +.010 -.010
15.500 +.010 -.010
16.870 ±.020
2
3
6 10 REQD
SIDE VIEW (REFLECTS BOTH SIDES)
8
3/16
COOLING AIR-OUT
COOLING AIR-OUT
20.810 +.032 -.032
16.810 +.032 -.032
5
4
1
4
J10
(POWER)
J9
(CALIBRATOR OUTPUT)
.880
6
12.160 +.032 -.032
J1
(CH1,+)
J2
(CH2,-)
A INPUT
J7
(CH2,-)
J6
(CH1,+)
B INPUT
5 9 REQD
1/8 TYPICAL
TIME BASE
'B'
'A'
J5
(TRIG IN)
J8
(EXT HORIZ IN)
J4
(TRIG IN)
J3
(EXT HORIZ IN)
1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 DATE 24 Apr 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			10		6	1015798-010	NUT-SLIDE MOUNTING
			9		5	UG/1094/U	CONNECTOR
			1		4	MS3112E16-8P	CONNECTOR
			1		3	1900028	AMPLIFIER, DIFFERENTIAL
			1		2	1900027	AMPLIFIER, DUAL TRACE
			1		1	TO BE ASSIGNED	OSCILLOSCOPE, DUAL BEAM RW565 MOD

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900037-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+ -

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44254 REF
DRAWN P. T. Wergin DATE 21 MAR 63
CHECKED [illegible] 4 APR 63
APPROVAL [illegible] 4 APR 63
APPROVAL [illegible] 4 APR 63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

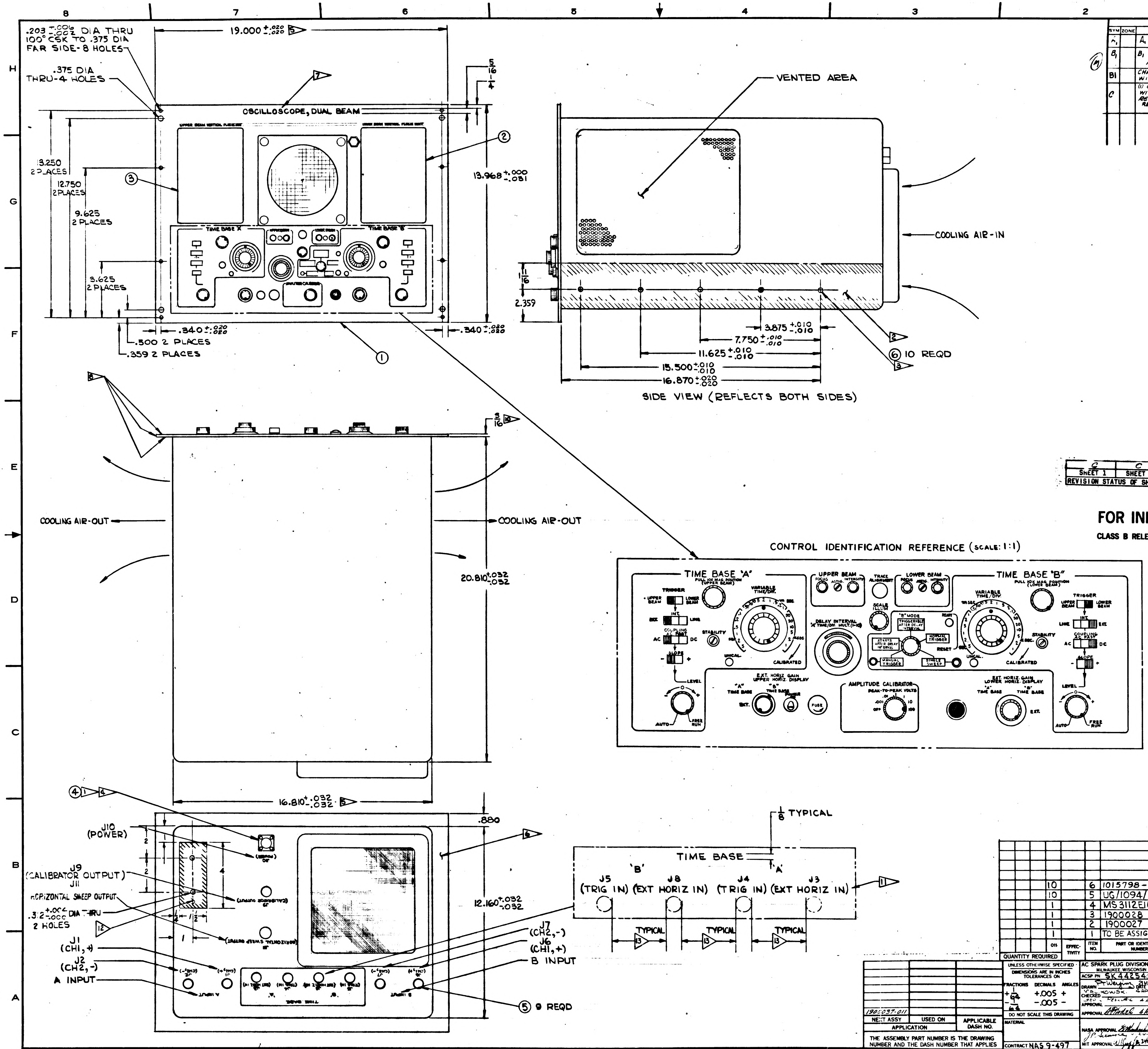
DUAL BEAM
OSCILLOSCOPE

CODE IDENT NO
SIZE E
1900026
SCALE 1:2
SHEET 1 OF 2

1900026 E

INCHES
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
REVISIONS					
A1		A1 REVISED & REDRAWN		63	PTW
B1		B1 REVISED TOLERANCE & ITEM 6 WAS 7901674-010	—	9 APR 63	WS
B1		CHANGE IN ACCORDANCE WITH MXC 87184		20 JUN 63	VS
C		(1) CHANGE IN ACCORDANCE WITH MXC 188669 REVISION STATUS CHANGED REVISED PER TDRR 00023		7 AUG 63	RGB



.203 +.006 -.002 DIA THRU 100° CSK TO .375 DIA FAR SIDE-8 HOLES
.375 DIA THRU-4 HOLES
19.000 +.020 -.020
5
7
OSCILLOSCOPE, DUAL BEAM
5/16
1/4
13.250 2 PLACES
12.750 2 PLACES
9.625 2 PLACES
3.625 2 PLACES
③
②
①
13.968 +.000 -.031
TIME BASE 'A'
TIME BASE 'B'
.340 +.020 -.020
.500 2 PLACES
.359 2 PLACES
VENTED AREA
COOLING AIR-IN
1 11/16
2.359
3.875 +.010 -.010
7.750 +.010 -.010
11.625 +.010 -.010
15.500 +.010 -.010
16.870 +.020 -.020
⑥ 10 REQD
2
3
SIDE VIEW (REFLECTS BOTH SIDES)
8
3/16
10
COOLING AIR-OUT
COOLING AIR-OUT
20.810 +.032 -.032
CONTROL IDENTIFICATION REFERENCE (SCALE: 1:1)
TIME BASE 'A'
PULL 10X MAG. POSITION (UPPER BEAM)
TRIGGER
UPPER BEAM
LOWER BEAM
INT.
EXT.
LINE
COUPLING AC FAST
AC
DC
SLOPE
LEVEL
AUTO
FREE RUN
VARIABLE TIME/DIV.
STABILITY
UNCAL.
CALIBRATED
UPPER BEAM
FOCUS
ASTIG.
INTENSITY
TRACE ALIGNMENT
LOWER BEAM
FOCUS
ASTIG.
INTENSITY
SCALE ILLUM
DELAY INTERVAL 'A' TIME/DIV. MULT. (1-10)
"B" MODE
TRIGGERABLE AFTER DELAY INTERVAL
STARTS AFTER DELAY INTERVAL
NORMAL TRIGGER
MANUAL TRIGGER
SINGLE SWEEP
READY
RESET
TIME BASE "B"
PULL 10X MAG. POSITION (LOWER BEAM)
EXT. HORIZ. GAIN UPPER HORIZ. DISPLAY
"A" TIME BASE
"B" TIME BASE
EXT.
POWER
FUSE
AMPLITUDE CALIBRATOR
PEAK-TO-PEAK VOLTS
OFF .001 .01 .1 1 10 100
EXT. HORIZ. GAIN LOWER HORIZ. DISPLAY
④ 1 4
16.810 +.032 -.032
5
.880
6
J10 (POWER)
J9 (CALIBRATOR OUTPUT)
J11 HORIZONTAL SWEEP OUTPUT
.312 +.004 -.000 DIA THRU 2 HOLES
12
J1 (CH1,+)
J2 (CH2,-)
A INPUT
J7 (CH2,-)
J6 (CH1,+)
B INPUT
⑤ 9 REQD
12.160 +.032 -.032
1/8 TYPICAL
TIME BASE
'B'
'A'
J5 (TRIG IN)
J8 (EXT HORIZ IN)
J4 (TRIG IN)
J3 (EXT HORIZ IN)
11
TYPICAL
13

C	C
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			10		6	1015798-010	NUT-SLIDE MOUNTING
			10		5	UG/1094/U	CONNECTOR
			1		4	MS3112E16-8P	CONNECTOR
			1		3	1900028	AMPLIFIER, DIFFERENTIAL
			1		2	1900027	AMPLIFIER, DUAL TRACE
			1		1	TO BE ASSIGNED	OSCILLOSCOPE, DUAL BEAM (RM565 MOD)
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900037-011		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS: + 1/64 - 1/64
DECIMALS: +.005 -.005
ANGLES: + -
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44254 (REF)
DRAWN P. Weging DATE 21 MAR 63
V. PALKOWSKI 4 APR 63
CHECKED
J. PESCURIC 4 APR 63
APPROVAL
APPROVAL Model 4 APR 63
NASA APPROVAL
J.P. Seemore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL BEAM
OSCILLOSCOPE

CODE IDENT NO.
SIZE E
1900026
SCALE 1:2
SHEET 1 OF 2

1900026 C

MIL 10775-P

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B1		CHANGE IN ACCORDANCE WITH MXC 187184		20 JUN 63	
C		(2) CHANGE IN ACCORDANCE WITH MXC 188669 REVISED PER TDRR		7 AUG 63	

REQUIREMENTS:

GENERAL:

THE OSCILLOSCOPE SHALL CONSIST OF AN ASSEMBLY OF A DUAL BEAM CATHODE RAY TUBE & SUITABLE CIRCUITRY TO OPERATE SIMULTANEOUSLY AS TWO INDEPENDENT OSCILLOSCOPES AS WELL AS PERFORM CERTAIN INTERDEPENDENT OPERATIONS AS DESCRIBED BELOW.

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP1900026

POWER: 105 - 125 VOLT 60 ± 5 CPS (630 WATTS APPROX.)

WEIGHT: 77 LBS (APPROX.)

CALIBRATOR: APPROX. 1000 CPS SQUARE WAVE RANGING FROM 1 mV TO 100 VOLTS IN 7 DECADE STEPS. ACCURACY WITHIN 3% OF INDICATED VOLTAGE.

POWER LOW SHALL BE ELECTRICALLY ISOLATED FROM CHASSIS & SIGNAL LOWS.

KNOBS: CONTROLS SHALL BE PER MS91528 TYPE F & K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

BEAM CONTROLS: THERE SHALL BE SEPARATE FOCUS, INTENSITY & ASTIGMATISM CONTROLS FOR EACH BEAM. THERE SHALL BE SEPARATE HORIZONTAL & SEPERATE VERTICAL DEFLECTION PLATES. THERE SHALL BE TWO SEPARATE INDEPENDENT BEAMS.

REAR INPUTS: ALL OSCILLOSCOPE INPUTS MUST BE ON THE REAR PANEL AS SHOWN. THIS REQUIRES WIRING FROM THE REAR PANEL OF THE SCOPE INTERNALLY TO THE REAR OF THE PLUG-IN AMPLIFIERS. THIS WIRING SHALL PASS THROUGH SUITABLE CONNECTORS SO THAT THE PLUG-IN UNITS MAY BE REMOVED WITHOUT ACCESS TO THE INSIDE OF THE OSCILLISCOPE CABINET.

THE SUPPLIERS NAME, ADDRESS & PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.
FRONT PANEL POWER ON LAMP SHALL BE COVERED WITH A GREEN LENS.

TIME BASE SWEEPS:
TWO SWEEPS SHALL OPERATE SIMULTANEOUSLY. SWEEP "A" SHALL BE ABLE TO DELAY SWEEP "B". THE DELAYED SWEEP CON.ROL SHALL BE A CONTINUOUS CONTROL & SHALL BE CAPABLE OF TRIGGERING SWEEP "B" AT ANY POINT ON THE WAVE FORM DISPLAYED BY SWEEP "A". THE CALIBRATED DELAY OF SWEEP "B" FROM SWEEP "A", SHALL BE 1.0 MICRO SEC. TO 50 SEC. (UNCAL. 0.5 MICRO SEC. TO 120 SEC.) WITH AN ACCURACY WITHIN 3%.

SWEEP REQUIREMENTS COMMON TO BOTH TIME BASES:

RANGE: CALIBRATED - 21 DISCRETE POSITIONS FROM 1 MICRO SEC./DIV TO 5 SEC./DIV. ACCURACY WITHIN 3%
UNCALIBRATED - CONTINUOUSLY VARIABLE BETWEEN 1 MICRO SEC./DIV. TO GREATER THAN 10 SEC./DIV.
ALL RANGE POSITIONS SHALL BE CAPABLE OF A 10 TIMES MAGNIFICATION.

TRIGGERING: THE UPPER BEAM VERTICAL INPUT OR THE LOWER BEAM VERTICAL INPUT SHALL TRIGGER EITHER SWEEP OR BOTH. LINE POWER OR EXTERNAL TRIGGER PROVISION SHALL BE AVAILABLE. IT SHALL BE POSSIBLE TO SELECT TRIGGER SIGNALS THROUGH A SELECTION SWITCH INDICATING DC, AC & AC FAST (OVER 1KC). A THREE POSITION CONTROL SHALL PROVIDE AN AUTOMATIC POSITION, A LEVEL CONTROL, & A FREE RUN POSITION. IT SHALL BE POSSIBLE TO CHOOSE A TRIGGER WITH A POSITIVE SLOPE OR A NEGATIVE SLOPE.

HORIZONTAL DISPLAY: A SWITCH SHALL SELECT SWEEP "TIME BASE A", "TIME BASE B", OR AN EXTERNAL HORIZONTAL INPUT. THE EXTERNAL HORIZONTAL INPUT SHALL BE VARIABLE FROM 0.1V TO 10.0V/DIV. WITH AN INPUT IMPEDANCE OF 100K AND A BAND PASS OF DC TO 350KC.

SWEEP REQUIREMENTS TIME BASE "B" ONLY:
IN ADDITION TO ALL THE REQUIREMENTS CALLED OUT, THE FOLLOWING CAPABILITIES SHALL BE REQUIRED OF "TIME BASE B" SWEEP.

A SWITCH SHALL PROVIDE:

MANUAL TRIGGERING:
A TRIGGER PULSE WHICH SHALL OVERRIDE ANY OTHER TRIGGER SET-IN. ONE TRIGGER PULSE SHALL OCCUR AS A RESULT OF EACH USE OF THIS SWITCH.

SINGLE SWEEP:
A TRIGGER PULSE FROM THE TRIGGER NETWORK BEING USED SHALL BE PERMITTED TO START A SINGLE SWEEP.

START AFTER DELAY INTERVAL:
THE "B" SWEEP SHALL BE TRIGGERED AFTER THE TIME DELAY AS SET IN BY THE DELAY INTERVAL CONTROL FROM SWEEP "A".

TRIGGERABLE AFTER DELAY INTERVAL.

NORMAL OPERATION.

TWO COPIES OF SERVICE MANUALS FOR THE DUAL BEAM OSCILLOSCOPE (INCLUDING MANUALS FOR EACH AMPLIFIER) SHALL BE SUPPLIED WITH EACH UNIT. THE MANUALS SHALL CONTAIN A SPARE PARTS LIST, SCHEMATIC DIAGRAMS, OPERATING INSTRUCTIONS, MAINTENANCE & CALIBRATION INSTRUCTIONS. A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

INTEPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327

NOTES:

1 CONNECTOR PIN IDENTIFICATION (MS 3112 E16-8P)

PIN	CONNECT TO
A	CHASSIS
B,C	OPEN
D	POWER HI
E	POWER LO
F,G,H	OPEN

2 SCREW HEADS SHALL NOT PROTRUDE BEYOND THE SIDE OF THE INSTRUMENT IN THIS AREA. EXTERNAL SURFACE OF CHASSIS WITHIN SLIDE MOUNTING AREA (SHADED AREA) MUST BE FREE OF PROTRUSIONS. THE SIDE WALL IN THIS AREA MUST BE OF SUFFICIENT STRENGTH TO SUPPORT THE OSCILLOSCOPE.

3 MOUNT NUT ON THE INSIDE OF CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE FROM THE INSIDE SURFACE OF THE CHASSIS AT EACH NUT.

4 A METAL CAP SHALL BE PROVIDED FOR EACH CONNECTOR EXCEPT J10, EXCEPT FOR HORIZONTAL SWEEP OUTPUT AND CALIBRATOR OUTPUT, THE CAP SHALL SHORT THE CONNECTOR. CALIBRATOR OUTPUT & HORIZONTAL SWEEP OUTPUT SHALL HAVE A NON-SHORTING CAP. ALL CONNECTORS SHALL BE IN THE REAR. EXACT LOCATION OF CONNECTOR ON REAR OF ASSEMBLY SHALL BE DETERMINED BY SUPPLIER.

5 19.000 & 16.810 INCH DIMENSIONS OF PANEL & CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. SIDES OF CHASSIS LOCATED BY 16.81 INCH DIMENSIONS MUST BE PARALLEL WITHIN .031 & PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.

6 BORDER AREA WITHIN 9/16 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR & FREE OF PROTRUSIONS.

7 CHARACTERS APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS PER 1002019. PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157 EXCEPT WHEN CONTRASTING COLOR IS NEEDED FOR COLOR CODING. CHARACTER STYLE TO BE FUTURA DEMI-BOLD PER ND-1002122 OR SIMILAR. EXCEPT WHERE OTHERWISE SPECIFIED THE CHARACTER HEIGHT (1/8 INCH PREFERRED) AND LOCATIONS SHALL BE DETERMINED BY THE SUPPLIER.

8 FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO FRONT & EDGES OF PANEL. APPLY 2 COATS OF TT-E-529A CLASS B, ENMAL, SEMI-GLOSS LIGHT GRAY, COLOR 26440 OF FED STD 595. NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

10 FRONT PANEL MATERIAL, EXCLUDING PLUG-IN AMPLIFIER PANELS SHALL BE 3/16 ALUMINUM 5052-H32.

11 MARKING OF REFERENCE DESIGNATIONS AND CONNECTOR IDENTIFICATION. CHARACTERS SHALL BE 1/8 INCH HIGH AND BE APPLIED PER ND-1002019.

12 IN THE INDICATED AREA, 1/2 INCH CLEARANCE SHALL BE PROVIDED FROM THE INSIDE SURFACE OF THE REAR PANEL AT EACH HOLE. THERE SHALL BE NO PROTRUSIONS ON THE EXTERNAL SURFACE OF THE PANEL IN THIS AREA.

13 RECOMMENDED CLEARANCE BETWEEN ADJACENT CONNECTORS - 1 1/2 INCHES OR GREATER.

AMPLIFIERS (PLUG-IN):
IT SHALL BE POSSIBLE TO INTERCHANGE THE TWO PLUG-IN AMPLIFIERS.
THE DIFFERENTIAL AMPLIFIER SHALL BE INTERCHANGEABLE WITH THE DIFFERENTIAL AMPLIFIER SPECIFIED ON 1900024.

POSITION IN WHICH AMPLIFIERS WILL BE USED:
LOWER BEAM: DUAL TRACE
UPPER BEAM: DIFFERENTIAL

THE OSCILLOSCOPE SHALL RETAIN THE CAPABILITIES OF OPERATING WITH STANDARD FRONT INPUT PLUG-IN AMPLIFIERS DESIGNED FOR THE TEKTRONIC MODEL 565 OSCILLOSCOPE.

DUAL BEAM OSCILLOSCOPE 1900026, DIFFERENTIAL AMPLIFIER 1900028, AND DUAL TRACE AMPLIFIER 1900027, SHALL BE COMPATIBLE WITH EACH OTHER. THEY SHALL BE COMBINED AND TESTED AS ONE UNIT.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

DATA SOURCE:
TEKTRONIX INC.
400 HIGGINS ROAD
PARK RIDGE, ILLINOIS
OSCILLOSCOPE, DUAL BEAM RM565

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900037-011		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN 5K44254
DRAWN MAZLOWSKI DATE 2-22-63
CHECKED PESKURIC 4 APR 63
APPROVAL
APPROVAL 4 APR 63
NASA APPROVAL
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

DUAL BEAM
OSCILLOSCOPE

CODE IDENT NO.
SIZE E
1900026
SCALE
SHEET 2 OF 2

1900026 C

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD

REQUIREMENTS:

GENERAL:

THE OSCILLOSCOPE SHALL CONSIST OF AN ASSEMBLY OF A DUAL BEAM CATHODE RAY TUBE & SUITABLE CIRCUITRY TO OPERATE SIMULTANEOUSLY AS TWO INDEPENDENT OSCILLOSCOPES AS WELL AS PERFORM CERTAIN INTERDEPENDENT OPERATIONS AS DESCRIBED BELOW.

GROUP I (INSPECTION BY SUPPLIER & USER):

THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN (ES) ND-

THE EQUIPMENT SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF (ES-) ND-

POWER: 105 - 125 VOLT 60 ± 5 CPS (630 WATTS APPROX.)

WEIGHT: 77 LBS (APPROX.)

CALIBRATOR: APPROX. 1000 CPS SQUARE WAVE RANGING FROM 1 mV TO 100 VOLTS IN 7 DECADE STEPS. ACCURACY WITHIN 3% OF INDICATED VOLTAGE.

POWER LOW SHALL BE ELECTRICALLY ISOLATED FROM CHASSIS & SIGNAL LOWS.

KNOBS: CONTROLS SHALL BE PER MS91528 TYPE F & K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

BEAM CONTROLS: THERE SHALL BE SEPARATE FOCUS, INTENSITY & ASTIGMATISM CONTROLS FOR EACH BEAM. THERE SHALL BE SEPARATE HORIZONTAL & SEPERATE VERTICAL DEFLECTION PLATES. THERE SHALL BE TWO SEPARATE INDEPENDENT BEAMS.

REAR INPUTS: ALL OSCILLOSCOPE INPUTS MUST BE ON THE REAR PANEL AS SHOWN. THIS REQUIRES WIRING FROM THE REAR PANEL OF THE SCOPE INTERNALLY TO THE REAR OF THE PLUG-IN AMPLIFIERS. THIS WIRING SHALL PASS THROUGH SUITABLE CONNECTORS SO THAT THE PLUG-IN UNITS MAY BE REMOVED WITHOUT ACCESS TO THE INSIDE OF THE OSCILLISCOPE CABINET.

THE SUPPLIERS NAME, ADDRESS & PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION IS NOT TO APPEAR ON THE FRONT PANEL.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

GROUP II (DESIGN REQUIREMENTS):

TIME BASE SWEEPS:

TWO SWEEPS SHALL OPERATE SIMULTANEOUSLY. SWEEP "A" SHALL BE ABLE TO DELAY SWEEP "B". THE DELAYED SWEEP CONTROL SHALL BE A CONTINUOUS CONTROL & SHALL BE CAPABLE OF TRIGGERING SWEEP "B" AT ANY POINT ON THE WAVE FORM DISPLAYED BY SWEEP "A". THE CALIBRATED DELAY OF SWEEP "B" FROM SWEEP "A", SHALL BE 1.0 MICRO SEC. TO 50 SEC. (UNCAL. 0.5 MICRO SEC. TO 120 SEC.) WITH AN ACCURACY OF 3%.

SWEEP REQUIREMENTS COMMON TO BOTH TIME BASES:

RANGE: CALIBRATED - 21 DISCRETE POSITIONS FROM 1 MICRO SEC./DIV TO 5 SEC./DIV. ACCURACY WITHIN 3%

UNCALIBRATED - CONTINUOUSLY VARIABLE BETWEEN 1 MICRO SEC./DIV. TO GREATER THAN 10 SEC./DIV.

ALL RANGE POSITIONS SHALL BE CAPABLE OF A 10 TIMES MAGNIFICATION.

TRIGGERING: THE UPPER BEAM VERTICAL INPUT OR THE LOWER BEAM VERTICAL INPUT SHALL TRIGGER EITHER SWEEP OR BOTH. LINE POWER OR EXTERNAL TRIGGER PROVISION SHALL BE AVAILABLE. IT SHALL BE POSSIBLE TO SELECT TRIGGER SIGNALS THROUGH A SELECTION SWITCH INDICATING DC, AC & AC FAST (OVER 1KC). A THREE POSITION CONTROL SHALL PROVIDE AN AUTOMATIC POSITION, A LEVEL CONTROL, & A FREE RUN POSITION. IT SHALL BE POSSIBLE TO CHOOSE A TRIGGER WITH A POSITIVE SLOPE OR A NEGATIVE SLOPE.

HORIZONTAL DISPLAY: A SWITCH SHALL SELECT SWEEP "TIME BASE A", "TIME BASE B", OR AN EXTERNAL HORIZONTAL INPUT. THE EXTERNAL HORIZONTAL INPUT SHALL BE VARIABLE.

SWEEP REQUIREMENTS TIME BASE "B" ONLY:

IN ADDITION TO ALL THE REQUIREMENTS CALLED OUT, THE FOLLOWING CAPABILITIES SHALL BE REQUIRED OF "TIME BASE B" SWEEP.

A SWITCH SHALL PROVIDE:

MANUAL TRIGGERING:

A TRIGGER PULSE WHICH SHALL OVERRIDE ANY OTHER TRIGGER SET-IN. ONE TRIGGER PULSE SHALL OCCUR AS A RESULT OF EACH USE OF THIS SWITCH.

SINGLE SWEEP:

A TRIGGER PULSE FROM THE TRIGGER NETWORK BEING USED SHALL BE PERMITTED TO START A SINGLE SWEEP.

START AFTER DELAY INTERVAL:

THE "B" SWEEP SHALL BE TRIGGERED AFTER THE TIME DELAY AS SET IN BY THE DELAY INTERVAL CONTROL FROM SWEEP "A".

TRIGGERABLE AFTER DELAY INTERVAL.

NORMAL OPERATION.

TWO COPIES OF SERVICE MANUALS FOR THE DUAL BEAM OSCILLOSCOPE SHALL BE SUPPLIED WITH EACH UNIT.

THE MANUALS SHALL CONTAIN A SPARE PARTS LIST, SCHEMATIC DIAGRAMS, OPERATING INSTRUCTIONS, MAINTENANCE & CALIBRATION INSTRUCTIONS. A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

NOTES:

1 CONNECTOR PIN IDENTIFICATION (MS 3112 E16-8P)

PIN	CONNECT TO
A	CHASSIS
B,C	OPEN
D	POWER HI
E	POWER LO
F,G,H	OPEN

2 SCREW HEADS SHALL NOT PROTRUDE BEYOND THE SIDE OF THE INSTRUMENT IN THIS AREA. EXTERNAL SURFACE OF CHASSIS WITHIN SLIDE MOUNTING AREA (SHADED AREA) MUST BE FREE OF PROTRUSIONS. THE SIDE WALL IN THIS AREA MUST BE OF SUFFICIENT STRENGTH TO SUPPORT THE OSCILLOSCOPE.

3 MOUNT NUT ON THE INSIDE OF CHASSIS. ALLOW 3/8 IN. SCREW CLEARANCE FROM THE INSIDE SURFACE OF THE CHASSIS AT EACH NUT.

4 A METAL CAP SHALL BE PROVIDED FOR EACH CONNECTOR. THE CAP SHALL PROVIDE AN ELECTRICAL CONDUCTOR FOR UNWANTED SIGNALS. ALL CONNECTORS SHALL BE IN THE REAR. EXACT LOCATION OF CONNECTOR ON REAR OF ASSEMBLY SHALL BE DETERMINED BY SUPPLIER.

5 19.000 & 16.810 INCH DIMENSIONS OF PANEL & CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. SIDES OF CHASSIS LOCATED BY 16.81 INCH DIMENSIONS MUST BE PARALLEL WITHIN .031 & PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.

6 BORDER AREA WITHIN 9/16 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL, SHALL BE CO-PLANAR & FREE OF PROTRUSIONS.

7 CHARACTERS APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS PER 1002019. PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157 EXCEPT WHEN CONTRASTING COLOR IS NEEDED FOR COLOR CODING. CHARACTER STYLE TO BE FUTURA DEMI-BOLD OR SIMILAR

8 FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO FRONT & EDGES OF PANEL. APPLY 2 COATS OF TT-E-529A CLASS B, ENAMEL, SEMI-GLOSS LIGHT GRAY, COLOR 26440 OF FED STD 595. NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

10 FRONT PANEL MATERIAL, EXCLUDING PLUG-IN AMPLIFIER PANELS SHALL BE 3/16 ALUMINUM 5052-H32.

11 MARKING OF REFERENCE DESIGNATIONS CHARACTERS TO BE APPLIED PER 1002019.

AMPLIFIERS (PLUG-IN):

IT SHALL BE POSSIBLE TO INTERCHANGE THE TWO PLUG-IN AMPLIFIERS.

THE DIFFERENTIAL AMPLIFIER SHALL BE INTERCHANGEABLE WITH THE DIFFERENTIAL AMPLIFIER SPECIFIED ON 1900024.

POSITION IN WHICH AMPLIFIERS WILL BE USED:

LOWER BEAM: DUAL TRACE

UPPER BEAM: DIFFERENTIAL

THE OSCILLOSCOPE SHALL RETAIN THE CAPABILITIES OF OPERATING WITH A STANDARD FRONT INPUT PLUG-IN AMPLIFIER.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

DATA SOURCE:

TEKTRONIX INC.
400 HIGGINS ROAD
PARK RIDGE, ILLINOIS

OSCILLOSCOPE, DUAL BEAM RM565

1900037-011		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44254
DRAWN MACKOWSKI DATE 2-22-63
CHECKED PESKURIC 4 Apr 63
APPROVAL
APPROVAL 4 Apr 63
NASA APPROVAL 4-24-63
MIT APPROVAL 24 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

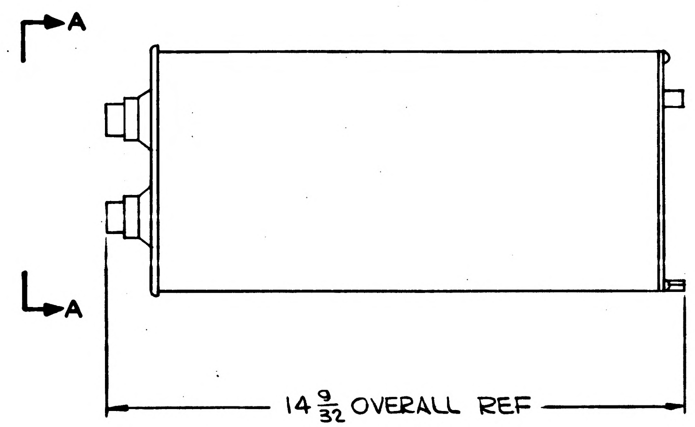
DUAL BEAM OSCILLOSCOPE

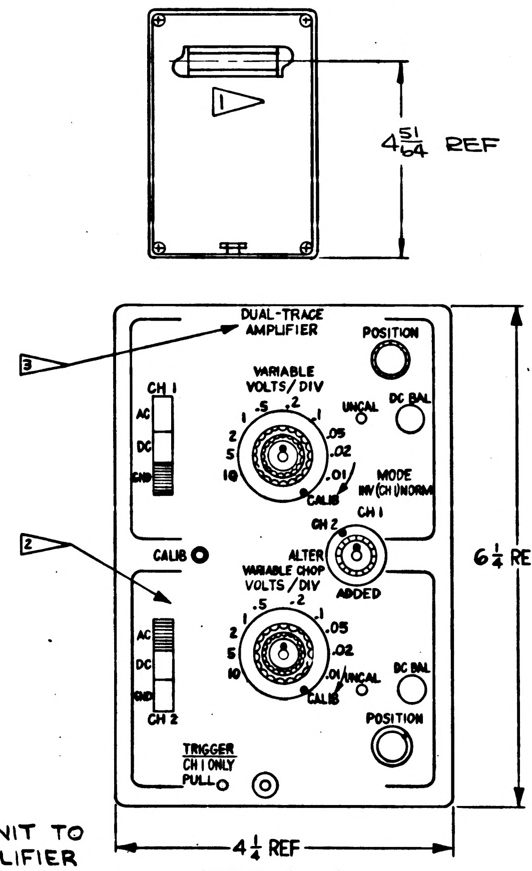
CODE IDENT NO
SIZE E
1900026
SCALE
SHEET 2 OF 2

1900026

1900027 B

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		CHANGE IN ACCORDANCE WITH MXC 187046		11 JUN 63	JEL
B	B-4	CHANGE IN ACCORDANCE WITH MXC 189014 PER TDRR 03709	—	21 AUG 63	





VIEW A-A
SCALE: FULL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

REQUIREMENTS WHEN USED WITH OSCILLOSCOPE 1900026:
EACH CHANNEL
SENSITIVITY: 10 CALIBRATED STEPS 10 mV/CM TO 10V/CM
UNCALIBRATED 10 mV/CM TO 25V/CM
ACCURACY: MAXIMUM ERROR SHALL BE WITHIN 3%
FREQUENCY: dc TO 10 MC
RISE TIME: 35 n SEC.
Z INPUT: 1 MEG OHM ± 100K
EACH CHANNEL SHALL OPERATE SINGLY, CHOPPED, OR ALTERNATELY

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PANEL. THIS INFORMATION IS NOT TO APPEAR ON FRONT PANEL.

1 NUMBER, TYPE AND LOCATION OF CONNECTORS INTERFACING THE OSCILLOSCOPE INDICATOR UNIT TO THE PLUG-IN AMPLIFIER SHALL BE DETERMINED BY THE SUPPLIER. THE AMPLIFIER SHALL BE DESIGNED FOR USE IN EITHER OF THE VERTICAL BEAM CAVITIES OF OSCILLOSCOPE 1900026. THE DESIGN SHALL NOT AFFECT THE DUAL-BEAM OSCILLOSCOPE'S CAPABILITY TO OPERATE SATISFACTORILY WITH STANDARD PRODUCTION AMPLIFIERS DESIGNED FOR THE TEKTRONIX 565 OSCILLOSCOPE.

DUAL TRACE AMPLIFIER 1900027, DIFFERENTIAL AMPLIFIER 1900028 AND DUAL BEAM OSCILLOSCOPE 1900026 SHALL BE ASSEMBLED AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT IN ATP 1900026

3 CHARACTERS SHALL BE APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS PER ND-1002019. PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157, EXCEPT WHEN CONTRASTING COLOR IS NEEDED FOR COLOR CODING. CHARACTER STYLE TO BE FUTURA DEMI-BOLD PER ND-1002122 OR SIMILAR. EXCEPT WHERE OTHERWISE SPECIFIED THE CHARACTER HEIGHT AND LOCATIONS SHALL BE DETERMINED BY THE SUPPLIER. PREFERRED CHARACTER HEIGHT 1/8 INCH.

2 FRONT PANEL FINISH P513 OF SPEC MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY TWO COATS OF TT-E-529 CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD 595.
NOTE: MIL-P-8585 SUPERSEDES MIL-P-6889 PRIMER.

REFERENCE DRAWING:
1900026 DUAL BEAM OSCILLOSCOPE
DATA SOURCE: TEKTRONIX INC.
400 HIGGINS ROAD
PARK RIDGE, ILLINOIS
AMPLIFIER, DUAL TRACE 3A1

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	AMPLIFIER, DUAL TRACE (MODEL NO. 3A1)
			011				

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900026-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL -
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44466
DRAWN P. Wegner DATE 26 MAR 63
MALIKOWSKI 4 APR 63
CHECKED
GEO. PESCIC 4 Apr 63
APPROVAL
APPROVAL 4 Apr 63
NASA APPROVAL 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER ASS'Y
DUAL-TRACE (SCOPE)

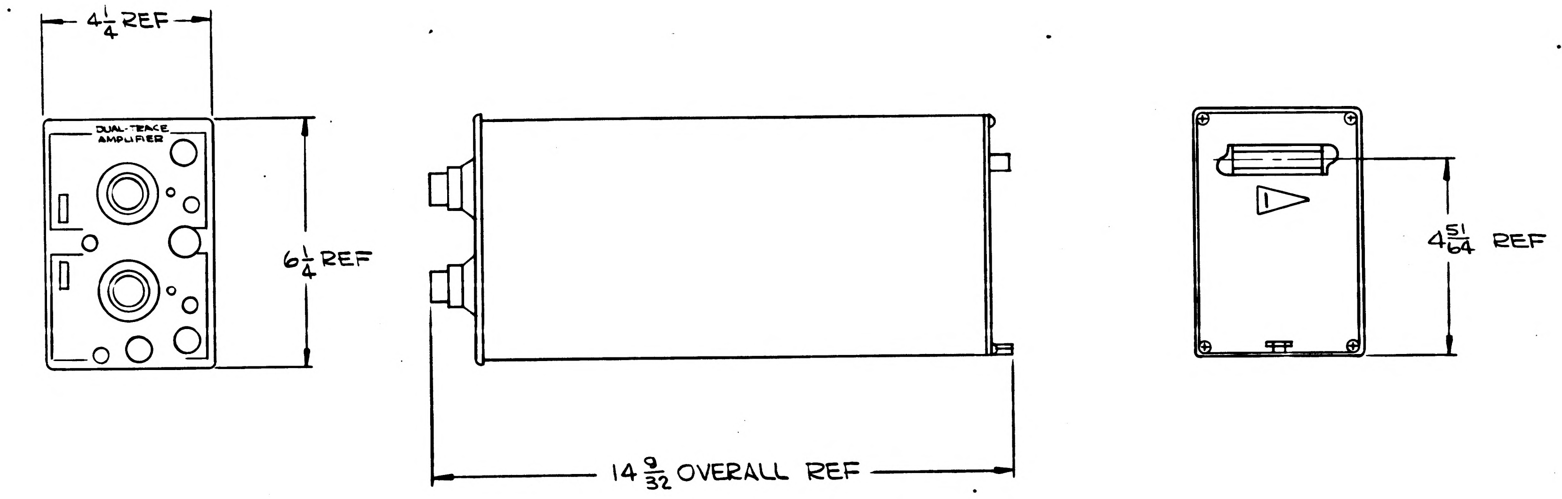
CODE IDENT NO.
SIZE D
1900027
SCALE 1:2
SHEET

MIL 10770—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900027

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO	DATE	APPD



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

REQUIREMENTS:
EACH CHANNEL
SENSITIVITY: 10 CALIBRATED STEPS 10 mV/CM TO 10V/CM
UNCALIBRATED 10 mV/CM TO 25V/CM
ACCURACY: WITHIN 3% IN CALIBRATED STEPS
FREQUENCY: dc TO 10 MC
RISE TIME: 35 n SEC.
Z INPUT: 1 MEG OHM ± 100K
TWO COPIES OF SERVICE MANUALS SHALL BE SUPPLIED WITH THIS UNIT. THE MANUALS SHALL CONTAIN A SPARE PARTS LIST, SCHEMATIC DIAGRAMS, OPERATING INSTRUCTIONS, MAINTENANCE AND CALIBRATION INSTRUCTIONS. A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED.
THE SUPPLIERS NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PANEL. THIS INFORMATION IS NOT TO APPEAR ON FRONT PANEL.

1 CONNECTION DESIGN FOR SIGNAL INPUTS FROM THE OSCILLOSCOPE INDICATOR UNIT TO THE PLUG-IN AMPLIFIER SHALL BE DETERMINED BY THE SUPPLIER. THE AMPLIFIER SHALL BE DESIGNED FOR USE IN EITHER OF THE VERTICAL BEAM CAVITIES OF OSCILLOSCOPE 1900026. THE DESIGN SHALL NOT AFFECT THE DUAL-BEAM OSCILLOSCOPE'S CAPABILITY TO OPERATE WITH STANDARD FRONT PANEL AMPLIFIER INPUTS.

DUAL TRACE AMPLIFIER 1900027, DIFFERENTIAL AMPLIFIER 1900028 AND DUAL BEAM OSCILLOSCOPE 1900026 SHALL BE ASSEMBLED AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT IN (ES)ND

DATA SOURCE: TEKTRONIX INC.
400 HIGGINS ROAD
PARK RIDGE, ILLINOIS
AMPLIFIER, DUAL TRACE 3A1

REFERENCE DRAWING:
1900026 DUAL BEAM OSCILLOSCOPE

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	AMPLIFIER, DUAL TRACE (MODEL NO. 3A1)
						-	
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900026-011		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44468
DRAWN P. Wagner DATE 26 MAR 63
MALIKOWSKI 4 APR 63
CHECKED
APPROVAL 4 Apr 63
APPROVAL 4 APR 63
NASA APPROVAL 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER ASS'Y
DUAL-TRACE (SCOPE)

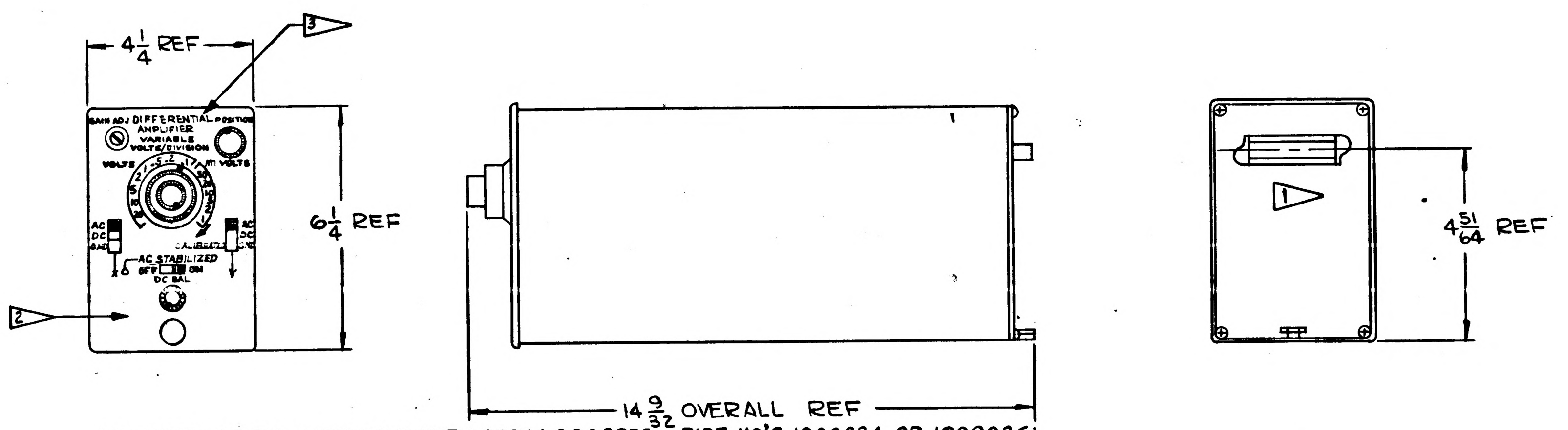
CODE IDENT NO.
SIZE D
1900027
SCALE 1:2
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10770-P

8 | 1900028 | 2

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		CHANGE IN ACCORDANCE WITH MXC 187047		11 JUN 63	AJEL EPS
B		CHANGE IN ACCORDANCE WITH MXC 189015 PER TDRR 03710		16 AUG 63	WSM CFP
				8 Oct 63	WH



REQUIREMENTS WHEN USED WITH OSCILLOSCOPES PART NO'S 1900024 OR 1900026:
SENSITIVITY
14 CALIBRATED STEPS: 1mV/CM TO 20V/CM
UNCALIBRATED: 1mV/CM TO 50 V/CM
FREQUENCY: dc TO 300 KC
ACCURACY: MAXIMUM ERROR SHALL BE WITHIN 3%
Z INPUT: 1 MEG OHM OR GREATER

[2] FRONT PANEL FINISH: APPLY FINISH P513 OF SPEC MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY TWO COATS OF TT-E-529 CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD 595.

NOTE: MIL-P-8585 SUPERSEDES MIL-P-6889 PRIMER.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PANEL. THIS INFORMATION IS NOT TO APPEAR ON FRONT PANEL.

[1] NUMBER, TYPE AND LOCATION OF CONNECTORS INTERFACING THE OSCILLOSCOPE INDICATOR UNIT TO THE PLUG-IN AMPLIFIER, SHALL BE DETERMINED BY THE SUPPLIER. THE AMPLIFIER SHALL BE DESIGNED FOR USE IN EITHER OF THE VERTICAL BEAM CAVITIES OF OSCILLOSCOPE 1900026 OR IN EITHER OF THE PLUG-IN CAVITIES OF MONITOR OSCILLOSCOPE 1900024. THE DESIGN SHALL NOT AFFECT THE DUAL BEAM OR THE MONITOR OSCILLOSCOPES CAPABILITY TO OPERATE SATISFACTORILY WITH STANDARD PRODUCTION AMPLIFIERS DESIGNED FOR THE TEKTRONIX 561 OR 565 OSCILLOSCOPE.
TESTING: USE EITHER ONE OF THE FOLLOWING:
DUAL BEAM USE:
DUAL TRACE AMPLIFIER 1900027, DIFFERENTIAL AMPLIFIER 1900028 AND DUAL BEAM OSCILLOSCOPE 1900026 SHALL BE ASSEMBLED AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT IN ATP 1900026.
MONITOR SCOPE USE:
DIFFERENTIAL AMPLIFIER 1900028, FOUR TRACE AMPLIFIER 1900025 AND MONITOR OSCILLOSCOPE 1900024 SHALL BE ASSEMBLED AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT IN ATP 1900024.

[3] CHARACTERS SHALL BE APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS PER ND-1002019. PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157, EXCEPT WHEN CONTRASTING COLOR IS NEEDED FOR COLOR CODING. CHARACTER STYLE TO BE FUTURA DEMI-BOLD PER ND-1002122 OR SIMILAR. EXCEPT WHERE OTHERWISE SPECIFIED THE CHARACTER HEIGHT AND LOCATIONS SHALL BE DETERMINED BY THE SUPPLIER. PREFERRED CHARACTER HEIGHT 1/8 INCH.

REFERENCE DRAWINGS:
1900026 DUAL BEAM OSCILLOSCOPE
1900024 MONITOR OSCILLOSCOPE

DATA SOURCE: TEKTRONIX INC.
400 HIGGINS ROAD
PARK RIDGE, ILLINOIS
AMPLIFIER, DIFFERENTIAL 2A63

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	AMPLIFIER, DIFF. (MODEL 2A63)
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900026-011		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44469
DRAWN PTWergin / MALIKOWSKI DATE 26 MAR 63 / 4 APR 63
CHECKED GEO. J. FESKUK 4 APR 63
APPROVAL 4 APR 63
APPROVAL 4 APR 63
NASA APPROVAL 4/24/63
MIT APPROVAL J. P. Hilmerg 4-24-63 for 24 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, DIFFERENTIAL (SCOPE)

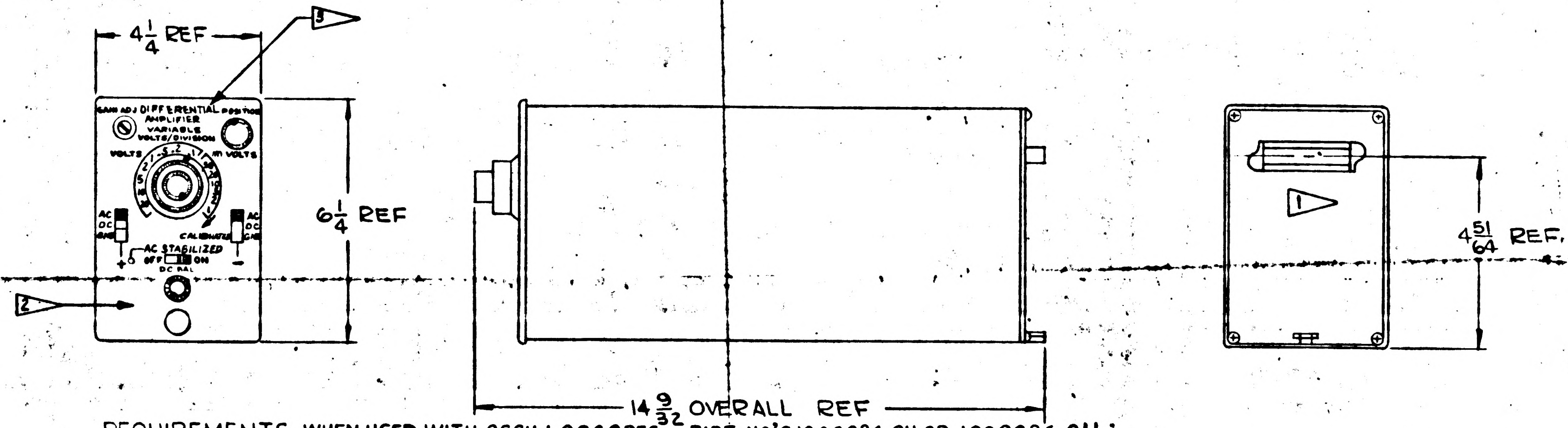
CODE IDENT NO. | SIZE D | 1900028
SCALE 1:2 | SHEET 1 OF 1

MIL 10770-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900028 C

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
A		CHANGE IN ACCORDANCE WITH MXC 187047		11 JUN 63	EFS
B		CHANGE IN ACCORDANCE WITH MXC 189015 PER TDRR 03710		16 AUG 63	WSM CTP
					WK
C		CHANGE IN ACCORDANCE WITH CM196590. PER TDRR 08094		6 APR 64	RWI



REQUIREMENTS WHEN USED WITH OSCILLOSCOPES PART NO'S 1900024-011 OR 1900026-011:

SENSITIVITY

14 CALIBRATED STEPS: 1mV/CM TO 20V/CM

UNCALIBRATED: 1mV/CM TO 50V/CM

FREQUENCY: dc TO 300 KC

ACCURACY: MAXIMUM ERROR SHALL BE WITHIN 3%

Z INPUT: 1 MEGOHM ± 2% PARALLELED BY 150 pf MAX.

2 FRONT PANEL FINISH: APPLY FINISH P513 OF SPEC MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY TWO COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD 595.

INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE SURFACE OF THE INTERNAL CHASSIS. THIS INFORMATION IS NOT TO APPEAR ON FRONT PANEL.

1 NUMBER, TYPE AND LOCATION OF CONNECTORS INTERFACING THE OSCILLOSCOPE INDICATOR UNIT TO THE PLUG-IN AMPLIFIER, SHALL BE DETERMINED BY THE SUPPLIER. THE AMPLIFIER SHALL BE DESIGNED FOR USE IN EITHER OF THE VERTICAL BEAM CAVITIES OF OSCILLOSCOPE 1900026-011 OR IN EITHER OF THE PLUG-IN CAVITIES OF MONITOR OSCILLOSCOPE 1900024-011.

TESTING: USE EITHER ONE OF THE FOLLOWING:

DUAL BEAM USE:

DUAL TRACE AMPLIFIER 1900027-011 DIFFERENTIAL AMPLIFIER 1900028-011 WHEN ASSEMBLED INTO A DUAL BEAM OSCILLOSCOPE 1900026-011, SHALL BE COMPATIBLE WITH EACH OTHER AND SHALL BE ABLE TO PASS ALL TESTS CALLED OUT IN ATP 1900026.

MONITOR SCOPE USE:

DIFFERENTIAL AMPLIFIER 1900028-011, FOUR TRACE AMPLIFIER 1900025-011 WHEN ASSEMBLED INTO A MONITOR OSCILLOSCOPE 1900024-011, SHALL BE COMPATIBLE WITH EACH OTHER AND SHALL BE ABLE TO PASS ALL TESTS CALLED OUT IN ATP 1900024.

3 CHARACTERS SHALL BE APPLIED BY SILK SCREEN OR OTHER SUITABLE PROCESS PER ND-1002019. PAINT TO BE SEMI-GLOSS INSTRUMENT BLACK ENAMEL, COLOR 514 OF ANA 157, EXCEPT WHEN CONTRASTING COLOR IS NEEDED FOR COLOR CODING. CHARACTER STYLE TO BE FUTURA DEMI-BOLD PER ND-1002122 OR SIMILAR. EXCEPT WHERE OTHERWISE SPECIFIED THE CHARACTER HEIGHT AND LOCATIONS SHALL BE DETERMINED BY THE SUPPLIER. PREFERRED CHARACTER HEIGHT 1/8 INCH.

REFERENCE DRAWINGS:

1900026 DUAL BEAM OSCILLOSCOPE

1900024 MONITOR OSCILLOSCOPE

DATA SOURCE: TEKTRONIX INC.
400 HIGGINS ROAD
PARK RIDGE, ILLINOIS
AMPLIFIER, DIFFERENTIAL 2A63 MOD 243C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0C... DATE 24 Apr 63

FILE PRINT

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			TO BE ASSIGNED	AMPLIFIER, DIFF. (MODEL 2A63 MOD 243C)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO:
1900026-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK44469
DRAWN P. Wagner DATE 26 MAR 63
MALIKOWSKI 4 APR 63
CHECKED
APPROVAL
APPROVAL 4 Apr 63
NASA APPROVAL
MIT APPROVAL 24 Apr 63

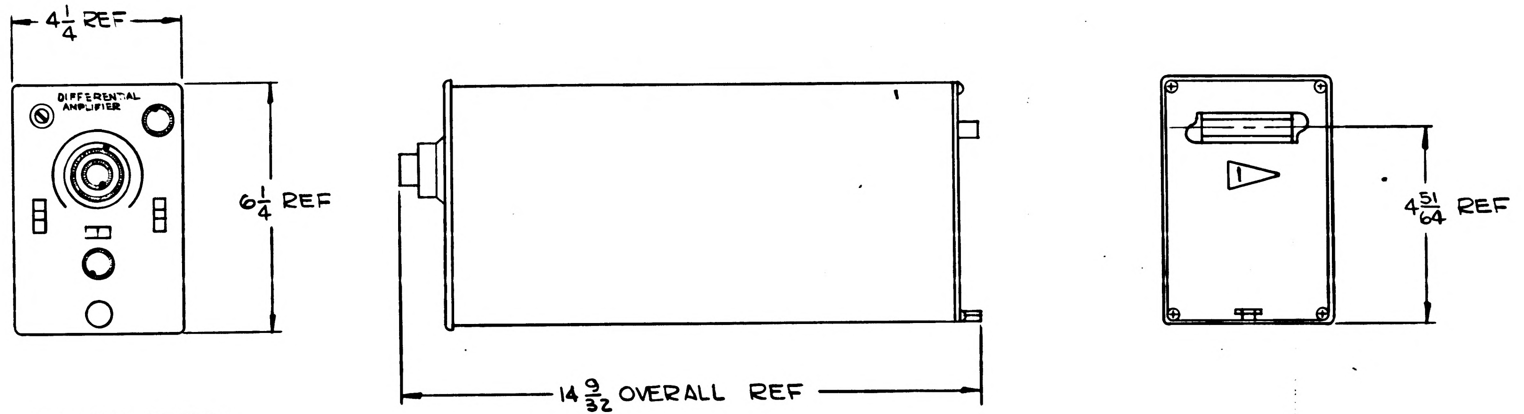
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER,
DIFFERENTIAL (SCOPE)
(SOURCE CONTROL DRAWING)

CODE IDENT NO
SIZE D
1900028
SCALE 1:2
SHEET 1 OF 1

1900028

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD



REQUIREMENTS:
SENSITIVITY
14 CALIBRATED STEPS: 1mV/CM TO 20V/CM
UNCALIBRATED: 1mV/CM TO 50 V/CM
FREQUENCY: dc TO 300 KC
ACCURACY: WITHIN 3% IN CALIBRATED STEPS.
Z INPUT: 1 MEG OHM ±100<
TWO COPIES OF SERVICE MANUALS SHALL BE SUPPLIED WITH THIS UNIT.
THE MANUALS SHALL CONTAIN A SPARE PARTS LIST, SCHEMATIC DIAGRAMS, OPERATING INSTRUCTIONS, MAINTENANCE AND CALIBRATION INSTRUCTIONS.
A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.
THE SUPPLIERS NAME, ADDRESS, AND PART NUMBER MUST BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PANEL.
THIS INFORMATION IS NOT TO APPEAR ON FRONT PANEL.

1 CONNECTION DESIGN OF SIGNAL INPUTS, FROM THE OSCILLOSCOPE INDICATOR UNIT TO THE PLUG-IN AMPLIFIER, SHALL BE DETERMINED BY THE SUPPLIER. THE AMPLIFIER SHALL BE DESIGNED FOR USE IN EITHER OF THE VERTICAL BEAM CAVITIES OF OSCILLOSCOPE 1900026 OR IN EITHER OF THE PLUG-IN CAVITIES OF MONITOR OSCILLOSCOPE 1900024. THE DESIGN SHALL NOT AFFECT THE DUAL BEAM OR THE MONITOR OSCILLOSCOPES CAPABILITY TO OPERATE WITH STANDARD FRONT PANEL AMPLIFIER INPUTS.

DUAL BEAM USE:
DUAL TRACE AMPLIFIER 1900027, DIFFERENTIAL AMPLIFIER 1900028 AND DUAL BEAM OSCILLOSCOPE 1900026 SHALL BE ASSEMBLED AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT IN(ES)ND- .
MONITOR SCOPE USE:
DIFFERENTIAL AMPLIFIER 1900028, FOUR TRACE AMPLIFIER 1900025 AND MONITOR OSCILLOSCOPE 1900024 SHALL BE ASSEMBLED AND THEN TESTED AS ONE UNIT. THE ASSEMBLY SHALL PASS ALL TESTS CALLED OUT IN(ES)ND- .

DATA SOURCE: TEKTRONIX INC.
400 HIGGINS ROAD
PARK RIDGE, ILLINOIS
AMPLIFIER, DIFFERENTIAL 2A63

REFERENCE DRAWINGS:
1900026 DUAL BEAM OSCILLOSCOPE
1900024 MONITOR OSCILLOSCOPE

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00899 DATE 24 Apr 63

QUANTITY REQUIRED							
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	AMPLIFIER, DIFF. (MODEL 2A63)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900026-011		

APPLICATION
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44469
DRAWN P. Weigand DATE 26 MAR 63
CHECKED Malikowski 4 APR 63
GEO. APPROVAL Peskar 4 Apr 63
APPROVAL 4 Apr 63
NASA APPROVAL
J. P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, DIFFERENTIAL (SCOPE)

CODE IDENT NO.
SIZE D
1900028
SCALE 1:2
SHEET

MIL 10770-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REQUIREMENTS:
DC OUTPUT:
VOLTAGE: ADJUSTABLE RANGE 24-32 VDC
CURRENT: OUTPUT RANGE 0-5 AMPS
REGULATION:
LINE: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A LINE CHANGE FROM 105 TO 125 V AC
LOAD: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A CHANGE FROM NO LOAD TO FULL LOAD.
RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD.
STABILITY: OUTPUT VOLTAGE SHALL VARY LESS THAN 0.1% FOR 8 HOURS AFTER WARMUP, UNDER FIXED LINE, LOAD AND TEMPERATURE CONDITIONS.
OUTPUT IMPEDANCE: .003 OHMS MAX. DC TO 1KC, .03 OHMS MAX. 1KC TO 10KC, 8 OHMS 10KC TO 100KC.
RECOVERY TIME FOR THE OUTPUT VOLTAGE TO RETURN TO WITHIN .25 V OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD: 250 MICROSECONDS MAX.
TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 1 VOLT.
TEMPERATURE COEFFICIENT: LESS THAN .05% PER DEGREE C.
OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.
PROGRAMMING: COMPLETE CAPABILITY: REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE.
PROGRAMMING CONSTANT: 100 OHMS PER VOLT OF OUTPUT.
REMOTE SENSING: VOLTAGE REGULATION LESS THAN 0.5% OR 10MV WITH 3V POWER LINE DROP.
DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE CONTROL ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.
CIRCUIT PROTECT-LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 10 TO 100% OF RATED FULL LOAD CURRENT.
SHORT CIRCUIT PROTECTION: REQUIRED
AC INPUT-VOLTAGE: 105 TO 125 V AC
-FREQUENCY: 50 TO 65 CPS
-PHASE: SINGLE
TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING AND REMOTE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.
FRONT PANEL-HARDWARE: PILOT LIGHT, INPUT FUSE AND OUTPUT FUSE.
NON-FRONT PANEL ADJUSTMENT CONTROLS: THE COARSE AND FINE VOLTAGE CONTROLS AND CURRENT LIMIT ADJUSTMENT CONTROL WITH LOCKING DEVICE SHALL BE ACCESSABLE FROM THE TOP OF THE POWER SUPPLY WITH TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUTSIDE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.
COOLING: CONVECTION
ISOLATION: POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.
THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.
TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.
THE POWER SUPPLY SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF (ES-) ND
THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ES-
THE REAR FACE OF THE FRONT PANEL SHALL BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.
WEIGHT: MUST NOT EXCEED 50 LBS.
ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

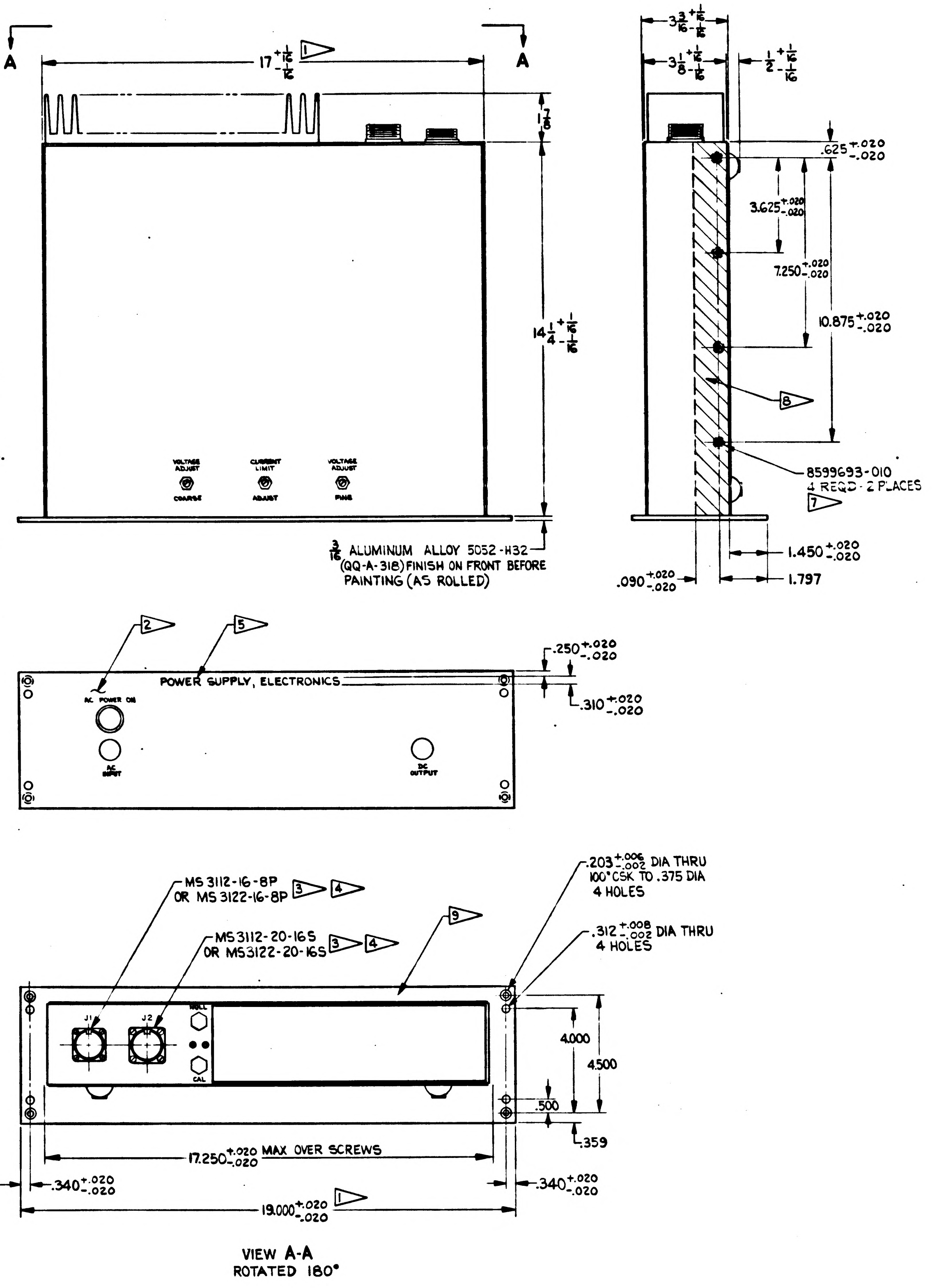
1. OUTSIDE SURFACES MUST BE FREE FROM BURRS AND SHARP EDGES. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010 AT ASSEMBLY.
2. FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY TWO COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595. (NOTE MIL-P-8585 PRIMER SUPERSEDES MIL-P-6889)
3. EXACT CONNECTOR LOCATION ON REAR OF POWER SUPPLY TO BE DETERMINED BY SUPPLIER.
4.

PIN LIST		
CONNECTOR PART NO	PIN LTR	PIN CONNECTION
MS 3112-16-8P OR MS 3122-16-8P	A	CHASSIS GRD
	B	OPEN
	C	OPEN
	D	115 VAC INPUT hi
	E	115 VAC Lo
	F	OPEN
	G	OPEN
	H	OPEN

PIN LIST FOR CONNECTOR PART NO. MS 3112-20-16S OR MS 3122-20-16S					
FOR LOCAL VOLTAGE ADJUSTING & SENSING		FOR REMOTE VOLTAGE ADJUSTMENT		FOR REMOTE VOLTAGE SENSING	
PIN LTR	PIN CONNECTIONS	PIN LTR	PIN CONNECTIONS	PIN LTR	PIN CONNECTIONS
A	CHASSIS GROUND	A	CHASSIS GRD	A	CHASSIS GRD
B		B	OPEN	B	
C		C		C	
D		D	REMOTE VOLTAGE ADJUSTMENT	D	-
E		E		E	LOAD
F		F		F	
G		G		G	+
H		H		H	
J		J	OPEN	J	TWISTED SHIELDED PAIR
K	OPEN	K		K	OPEN
L		L		L	
M		M		M	
N		N		N	
P		P		P	
R		R		R	
S		S		S	

5. CHARACTERS PER ND 1002019 (FUTURA DEMIBOLD). CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS, INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

7. MOUNT NUT 8599693-010 FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{3}{8}$ INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.
8. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. IN THIS AREA THE CHASSIS SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.
9. BORDER AREA WITHIN $\frac{3}{16}$ INCH OF PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANER AND FREE OF PROTRUSIONS.


A
A
17 $^{+\frac{1}{16}}_{-\frac{1}{16}}$ 1
$1\frac{7}{8}$
$14\frac{1}{4}$ $^{+\frac{1}{16}}_{-\frac{1}{16}}$
VOLTAGE ADJUST COARSE
CURRENT LIMIT ADJUST
VOLTAGE ADJUST FINE
$\frac{3}{16}$ ALUMINUM ALLOY 5052-H32 (QQ-A-318) FINISH ON FRONT BEFORE PAINTING (AS ROLLED)
$3\frac{3}{16}$ $^{+\frac{1}{16}}_{-\frac{1}{16}}$
$3\frac{1}{8}$ $^{+\frac{1}{16}}_{-\frac{1}{16}}$
$\frac{1}{2}$ $^{+\frac{1}{16}}_{-\frac{1}{16}}$
.625 $^{+.020}_{-.020}$
3.625 $^{+.020}_{-.020}$
7.250 $^{+.020}_{-.020}$
10.875 $^{+.020}_{-.020}$
8
8599693-010
4 REQD - 2 PLACES
7
1.450 $^{+.020}_{-.020}$
1.797
.090 $^{+.020}_{-.020}$
2
5
POWER SUPPLY, ELECTRONICS
AC POWER ON
AC INPUT
DC OUTPUT
.250 $^{+.020}_{-.020}$
.310 $^{+.020}_{-.020}$
MS 3112-16-8P OR MS 3122-16-8P 3 4
MS3112-20-16S OR MS3122-20-16S 3 4
9
.203 $^{+.006}_{-.002}$ DIA THRU 100° CSK TO .375 DIA 4 HOLES
.312 $^{+.008}_{-.002}$ DIA THRU 4 HOLES
J1
J2
NULL
CAL
4.000
4.500
.500
.359
17.250 $^{+.020}_{-.020}$ MAX OVER SCREWS
.340 $^{+.020}_{-.020}$
.340 $^{+.020}_{-.020}$
19.000 $^{+.020}_{-.020}$ 1

VIEW A-A
ROTATED 180°

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		REVISED & REDRAWN	S.S. 51405	2 APR 63	

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

DATA SOURCE:
ELECTRONIC MEASUREMENTS CO.
EATONTOWN, NEW JERSEY

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
						TO BE ASSIGNED	POWER SUPPLY (MODEL PL-36-5)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900035-011	1900004	

APPLICATION
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+1°
$-\frac{1}{64}$	-.005	-1°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN 5K-44284
DRAWN C. LENZ DATE 5 OCT 62
CHECKED W. Diehl 5 APR 63
APPROVAL 5 Apr 5, 1963
APPROVAL 5 APR 63
NASA APPROVAL
MIT APPROVAL 24 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
ELECTRONICS

CODE IDENT NO
SIZE E
1900029
SCALE 1:2
SHEET

INCHES
PHOTOGRAPHIC SCALE ONLY

REQUIREMENTS:

(THE ASSEMBLY CONSISTS OF TWO INDEPENDENT POWER SUPPLIES, EACH WITH THE FOLLOWING REQUIREMENTS)

DC OUTPUT:

VOLTAGE: ADJUSTABLE RANGE 24-32 VDC

CURRENT: OUTPUT RANGE 0-5 AMPS

REGULATION:

LINE: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A LINE CHANGE FROM 105 TO 125 V AC

LOAD: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A CHANGE FROM NO LOAD TO FULL LOAD.

RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD.

STABILITY: OUTPUT VOLTAGE SHALL VARY LESS THAN 0.1% FOR 8 HOURS AFTER WARMUP, UNDER FIXED LINE, LOAD AND TEMPERATURE CONDITIONS.

OUTPUT IMPEDANCE: .003 OHMS MAX. DC TO 1KC, .03 OHMS MAX. 1KC TO 10KC, .8 OHMS 10 KC TO 100 KC.

RECOVERY TIME FOR THE OUTPUT VOLTAGE TO RETURN TO WITHIN .25 V OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD: 250 MICROSECONDS MAX.

TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 1 VOLT.

TEMPERATURE COEFFICIENT: LESS THAN .05% PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

PROGRAMMING: COMPLETE CAPABILITY: REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE.
PROGRAMMING CONSTANT: 100 OHMS PER VOLT OF OUTPUT.

FUSES: EACH SUPPLY SHALL BE PROTECTED WITH A SUITABLE INPUT POWER FUSE.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE CONTROL ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.

CIRCUIT PROTECT-LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 10 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT-VOLTAGE: 105 TO 125 V AC
-FREQUENCY: 55 TO 65 CPS
-PHASE: SINGLE

TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING AND REMOTE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.

FRONT PANEL-HARDWARE: PILOT LIGHT.

NON-FRONT PANEL ADJUSTMENT CONTROLS: THE COARSE AND FINE VOLTAGE CONTROLS AND CURRENT LIMIT ADJUSTMENT CONTROL WITH LOCKING DEVICE SHALL BE ACCESSABLE FROM THE TOP OF THE POWER SUPPLY WITH TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUTSIDE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

COOLING: CONVECTION

ISOLATION: POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900029.

THE REAR FACE OF THE FRONT PANEL SHALL BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

WEIGHT: MUST NOT EXCEED 50 LBS.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

1 OUTSIDE SURFACES MUST BE FREE FROM BURRS AND SHARP EDGES. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH. 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, ½ INCH FROM BACK SIDE OF FRONT PANEL, AND ½ INCH FROM BOTTOM SURFACE OF CHASSIS

2 FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY TWO COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595. (NOTE MIL-P-8585 PRIMER SUPERSEDES MIL-P-6889)

3 EXACT CONNECTOR LOCATION ON REAR OF POWER SUPPLY TO BE DETERMINED BY SUPPLIER.

4

PIN LIST			PIN LIST FOR CONNECTOR PART NO. MS 3112E-20-16S OR MS 3122E-20-16S					
CONNECTOR PART NO	PIN LTR	PIN CONNECTION	FOR LOCAL VOLTAGE ADJUSTING & SENSING		FOR REMOTE VOLTAGE ADJUSTMENT		FOR REMOTE VOLTAGE SENSING	
			PIN LTR	PIN CONNECTIONS	PIN LTR	PIN CONNECTIONS	PIN LTR	PIN CONNECTIONS
MS 3112E-16-8P OR MS 3122E-16-8P	A	CHASSIS GRD	A	CHASSIS GROUND	A	CHASSIS GND.	A	CHASSIS GND
	B	OPEN	B		B		B	
	C	OPEN	C		C		C	
	D	115 VAC INPUT hi	D	OPEN	D	OPEN	D	OPEN
	E	115 VAC Lo	E		E	REMOTE VOLTAGE ADJ	E	LOAD
	F	OPEN	F		F		F	
	G	OPEN	G	OPEN	G	OPEN	G	OPEN
	H	OPEN	H		H		H	
			J		J	OPEN	J	
			K		K	TWISTED SHIELDED PAIR	K	TWISTED SHIELDED PAIR
			L		L		L	
			M		M		M	
			N		N		N	
			P		P		P	
			R	30V Hi	R	30V Hi	R	30V Hi
			S	30V Lo	S	30V LO	S	30V Lo

5 CHARACTERS PER ND 1002019 (FUTURA DEMIBOLD). CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS, INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

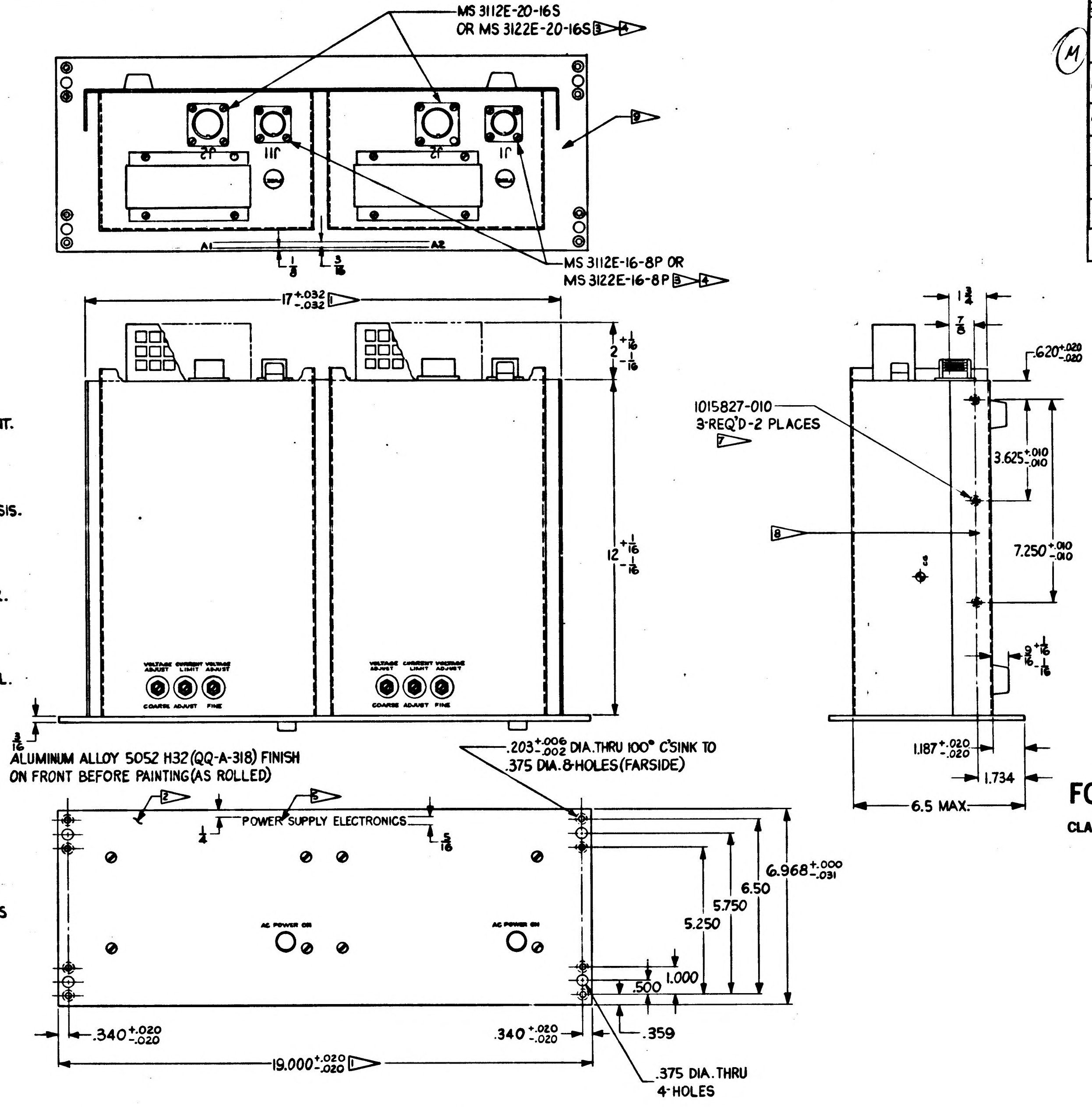
7 MOUNT NUT 1015827-010 FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{3}{8}$ INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

8 THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. IN THIS AREA THE CHASSIS SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

9 BORDER AREA WITHIN $\frac{3}{16}$ INCH OF PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANER AND FREE OF PROTRUSIONS.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DATA SOURCE:
TRYGON ELECTRONICS INC
ROOSEVELT, NEW YORK



REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		REVISED & REDRAWN	S.O. 51405	2 APR 63	
C1		MXC 186036 CHANGES WERE ACCOMPLISHED ON "C" CHANGE		3 JUN 63	JEL
C2		CHANGE IN ACCORDANCE WITH MXC-186732		3 JUN 63	JEL
D		CHANGE IN ACCORDANCE WITH MXC-187428		26 JUNE 63	
E		CHANGE IN ACCORDANCE WITH MXC 187962		2 JUL 63	C.A.M.
F		CHANGE IN ACCORDANCE WITH MXC 188468		1 AUG 63	JAL
F		INCORPORATES CHANGES C1 THRU F PER TDRR D2555		AUG 63	

(M)

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

						TO BE ASSIGNED	POWER SUPPLY (MODEL PL-36-5)	
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS			

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900035-011	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+1°
$-\frac{1}{64}$	−.005	−1°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK-44284

DRAWN C. LENZ DATE 8 OCT 62
CHECKED W. Diehl 5 APR 63
APPROVAL R. Rahn Ap 5, 1963
APPROVAL 5 APR 63
NASA APPROVAL
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
ELECTRONICS

CODE IDENT NO

SIZE E

1900029

SCALE 1:2

SHEET

1900029 F

REQUIREMENTS:

(THE ASSEMBLY CONSISTS OF TWO INDEPENDENT POWER SUPPLIES, EACH WITH THE FOLLOWING REQUIREMENTS)

DC OUTPUT:
- VOLTAGE: ADJUSTABLE RANGE 24-32 VDC
- CURRENT: OUTPUT RANGE 0-5 AMPS

REGULATION:
- LINE: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A LINE CHANGE FROM 105 TO 125 V AC
- LOAD: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A CHANGE FROM NO LOAD TO FULL LOAD.

RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD.

STABILITY: OUTPUT VOLTAGE SHALL VARY LESS THAN 0.1% FOR 8 HOURS AFTER WARMUP, UNDER FIXED LINE, LOAD AND TEMPERATURE CONDITIONS.

OUTPUT IMPEDANCE: .003 OHMS MAX. DC TO 1KC, .03 OHMS MAX. 1KC TO 10 KC, .8 OHMS 10 KC TO 100 KC.

RECOVERY TIME FOR THE OUTPUT VOLTAGE TO RETURN TO WITHIN .25 V OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD: 250 MICROSECONDS MAX.

TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 1 VOLT.

TEMPERATURE COEFFICIENT: LESS THAN .05% PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

PROGRAMMING: COMPLETE CAPABILITY: REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE. PROGRAMMING CONSTANT: 100 OHMS PER VOLT OF OUTPUT.

FUSES: EACH SUPPLY SHALL BE PROTECTED WITH A SUITABLE INPUT POWER FUSE.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE CONTROL ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.

CIRCUIT PROTECT-LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 10 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT-VOLTAGE: 105 TO 125 V AC
- -FREQUENCY: 55 TO 65 CPS
- -PHASE: SINGLE

TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING AND REMOTE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.

FRONT PANEL-HARDWARE: PILOT LIGHT.

NON-FRONT PANEL ADJUSTMENT CONTROLS: THE COARSE AND FINE VOLTAGE CONTROLS AND CURRENT LIMIT ADJUSTMENT CONTROL WITH LOCKING DEVICE SHALL BE ACCESSABLE FROM THE TOP OF THE POWER SUPPLY WITH TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUTSIDE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

COOLING: CONVECTION

ISOLATION: POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900029.

THE REAR FACE OF THE FRONT PANEL SHALL BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

WEIGHT: MUST NOT EXCEED 50 LBS.

ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

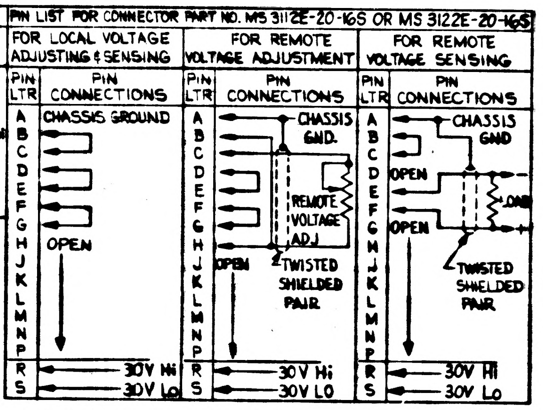
1▷ OUTSIDE SURFACES MUST BE FREE FROM BURRS AND SHARP EDGES. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH. 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, ½ INCH FROM BACK SIDE OF FRONT PANEL, AND ½ INCH FROM BOTTOM SURFACE OF CHASSIS

2▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY TWO COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595. (NOTE MIL-P-8585 PRIMER SUPERSEDES MIL-P-6889)

4▷

PIN LIST		
CONNECTOR PART NO	PIN LTR	PIN CONNECTION
MS 3112E-16-8P OR MS 3122E-16-8P	A	CHASSIS GRD
	B	OPEN
	C	OPEN
	D	115 VAC INPUT Hi
	E	115 VAC Lo
	F	OPEN
	G	OPEN
	H	OPEN

PIN LIST FOR CONNECTOR PART NO. MS 3112E-20-16S OR MS 3122E-20-16S


FOR LOCAL VOLTAGE ADJUSTING & SENSING
PIN LTR
PIN CONNECTIONS
A B C D E F G H J K L M N P R S
CHASSIS GROUND
OPEN
30V Hi
30V Lo
FOR REMOTE VOLTAGE ADJUSTMENT
PIN LTR
PIN CONNECTIONS
A B C D E F G H J K L M N P R S
CHASSIS GND.
REMOTE VOLTAGE ADJ
OPEN
TWISTED SHIELDED PAIR
30V Hi
30V LO
FOR REMOTE VOLTAGE SENSING
PIN LTR
PIN CONNECTIONS
A B C D E F G H J K L M N P R S
CHASSIS GND
OPEN
OPEN
LOAD
TWISTED SHIELDED PAIR
30V HI
30V Lo

5▷ CHARACTERS PER ND 1002019 (FUTURA DEMIBOLD). CHARACTER HEIGHT ⅛ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS, INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

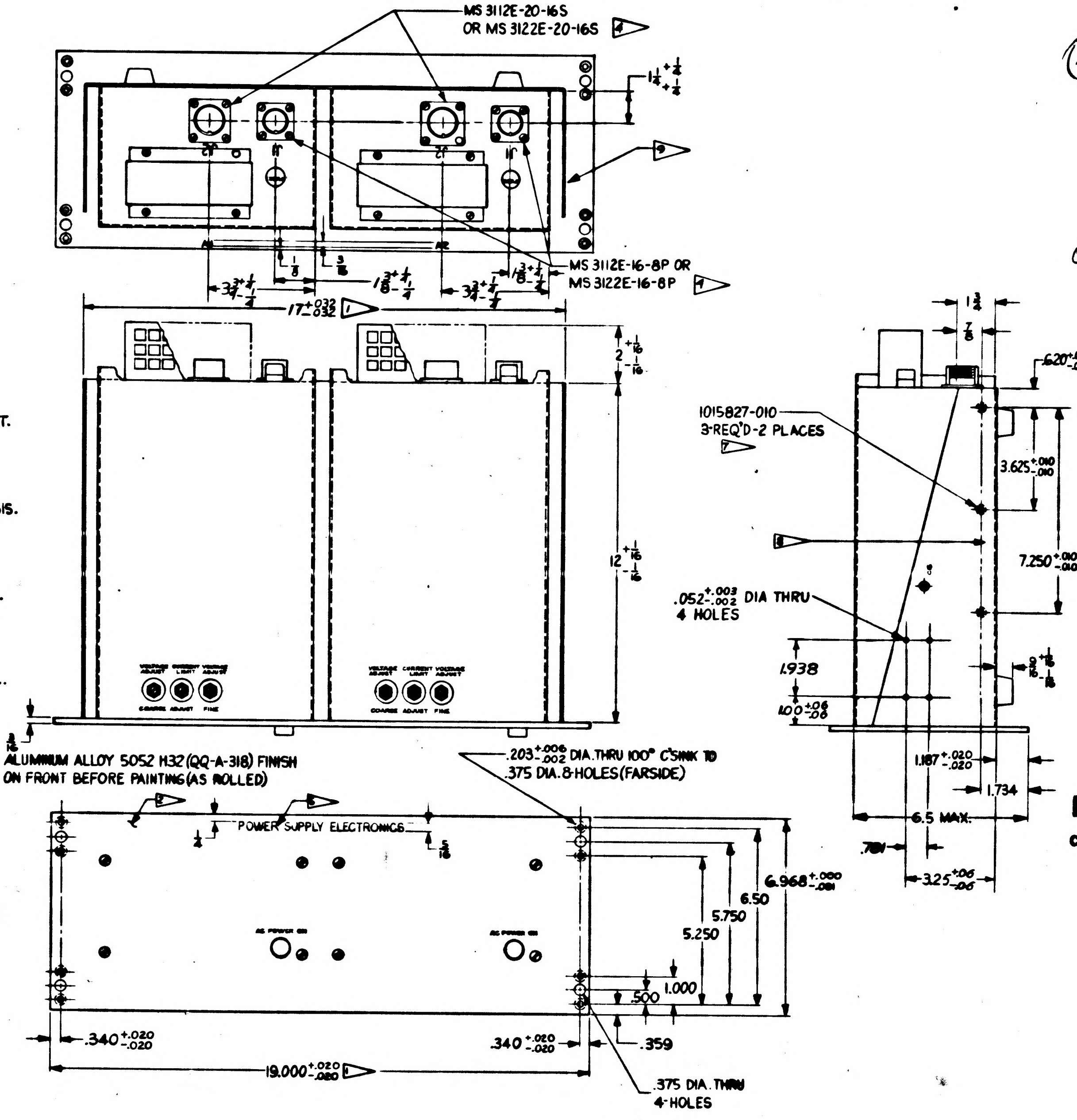
7▷ MOUNT NUT 1015827-010 FROM THE INSIDE OF THE CHASSIS. ALLOW ⅜ INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

8▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. IN THIS AREA THE CHASSIS SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

9▷ BORDER AREA WITHIN $\frac{3}{16}$ INCH OF PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANER AND FREE OF PROTRUSIONS.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DATA SOURCE:
TRYGON ELECTRONICS INC
ROOSEVELT, NEW YORK


MS 3112E-20-16S
OR MS 3122E-20-16S 4
1¼ +¼ +¼
9
1/8
3/16
3¾ +¼ -¼
1⅝ +¼ -¼
3¾ +¼ -¼
1⅝ +¼ -¼
MS 3112E-16-8P OR
MS 3122E-16-8P 4
17 +.032 -.032 1
2 +1/16 -1/16
12 +1/16 -1/16
VOLTAGE ADJUST
CURRENT LIMIT
VOLTAGE ADJUST
COARSE ADJUST FINE
3/16
ALUMINUM ALLOY 5052 H32 (QQ-A-318) FINISH ON FRONT BEFORE PAINTING (AS ROLLED)
.203 +.006 -.002 DIA. THRU 100° C'SINK TO .375 DIA. 8-HOLES (FARSIDE)
2
5
¼
POWER SUPPLY ELECTRONICS
5/16
AC POWER ON
AC POWER ON
6.968 +.000 -.001
6.50
5.750
5.250
1.000
.500
.340 +.020 -.020
.340 +.020 -.020
.359
19.000 +.020 -.020 1
.375 DIA. THRU 4-HOLES
1¾
⅞
.620 +.020 -.020
1015827-010
3-REQ'D-2 PLACES
7
8
3.625 +.010 -.010
7.250 +.010 -.010
.052 +.003 -.002 DIA THRU 4 HOLES
9/16 +1/16 -1/16
1.938
1.00 +.06 -.06
1.187 +.020 -.020
1.734
6.5 MAX.
.781
3.25 +.06 -.06

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD.
C		REVISED & REDRAWN	S.O. 51405	2 APR 63	WA
C1		MXC 186036 CHANGES WERE ACCOMPLISHED ON "C" CHANGE		3 JUN 63	JEL / JEFS
C2		CHANGE IN ACCORDANCE WITH MXC-186732		3 JUN 63	JEL / JEFS
D		CHANGE IN ACCORDANCE WITH MXC-187428		26 JUNE 63	[illegible]
E		CHANGE IN ACCORDANCE WITH MXC 187962		12 JUL 63	C.A.M / CJP
F		CHANGE IN ACCORDANCE WITH MXC 188468		1 AUG 63	JGL
F		INCORPORATES CHANGES C1 THRU F PER TDRR 02515		AUG 63	[illegible]
G		CHANGE IN ACCORDANCE WITH MXC-19.068		24 OCT. 63	A.K / E
H		CHANGE IN ACCORDANCE WITH MXC 192071 PER TDRR 09384		14 NOV 63	S.H / EL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Jan 63

						TO BE ASSIGNED	POWER SUPPLY (MODEL PV-36-5)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900035-011	900004	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+1°
$-\frac{1}{64}$	-.005	-1°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44284
DRAWN C. LENZ DATE
CHECKED Diehl 5 APR 63
APPROVAL R Rahn Ap 5, 1963
APPROVAL 5 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY, ELECTRONICS

CODE IDENT NO.
SIZE E
1900029
SCALE 1:2
SHEET

1900029 H

MIL 10772-P

REQUIREMENTS:

(THE ASSEMBLY CONSISTS OF TWO INDEPENDENT POWER SUPPLIES, EACH WITH THE FOLLOWING REQUIREMENTS)

DC OUTPUT:

VOLTAGE: ADJUSTABLE RANGE 24-32 VDC

CURRENT: OUTPUT RANGE 0-5 AMPS

REGULATION:

LINE: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A LINE CHANGE FROM 105 TO 125 V AC

LOAD: MUST BE LESS THAN 0.05% OVER THE VOLTAGE RANGE OF 24 TO 32 VOLTS, FOR A CHANGE FROM NO LOAD TO FULL LOAD.

RIPPLE: MUST BE LESS THAN 5 MILLIVOLTS RMS FROM NO LOAD TO FULL LOAD.

STABILITY: OUTPUT VOLTAGE SHALL VARY LESS THAN 0.1% FOR 8 HOURS AFTER WARMUP, UNDER FIXED LINE, LOAD AND TEMPERATURE CONDITIONS.

OUTPUT IMPEDANCE: .003 OHMS MAX. DC TO 1KC, .03 OHMS MAX. 1KC TO 10 KC, .8 OHMS 10 KC TO 100 KC.

RECOVERY TIME FOR THE OUTPUT VOLTAGE TO RETURN TO WITHIN .25 V OF THE OUTPUT VOLTAGE SETTING FOR A CHANGE FROM NO LOAD TO FULL LOAD: 250 MICROSECONDS MAX.

TURN-ON, TURN-OFF TRANSIENT BEYOND REGULATED OUTPUT LIMITS SHALL BE LESS THAN 1 VOLT.

TEMPERATURE COEFFICIENT: LESS THAN .05% PER DEGREE C.

OUTPUT POLARITY: FLOATING, POSITIVE OR NEGATIVE.

PROGRAMMING: COMPLETE CAPABILITY: REMOTE VOLTAGE CONTROL OVER COMPLETE OUTPUT RANGE.

PROGRAMMING CONSTANT: 100 OHMS PER VOLT OF OUTPUT.

FUSES: EACH SUPPLY SHALL BE PROTECTED WITH A SUITABLE INPUT POWER FUSE.

DC VOLTAGE ADJUSTMENT RESOLUTION: THE VOLTAGE CONTROL ADJUSTMENTS SHALL BE IN INCREMENTS OF LESS THAN 10 MV.

CIRCUIT PROTECT-LOAD: CURRENT LIMITING MUST BE ADJUSTABLE FROM 10 TO 100% OF RATED FULL LOAD CURRENT.

SHORT CIRCUIT PROTECTION: REQUIRED

AC INPUT-VOLTAGE: 105 TO 125 V AC
-FREQUENCY: 55 TO 65 CPS
-PHASE: SINGLE

TERMINATIONS: INPUT, OUTPUT, REMOTE SENSING AND REMOTE PROGRAM TO BE BROUGHT OUT AT REAR OF CHASSIS.

FRONT PANEL-HARDWARE: PILOT LIGHT.

NON-FRONT PANEL ADJUSTMENT CONTROLS: THE COARSE AND FINE VOLTAGE CONTROLS AND CURRENT LIMIT ADJUSTMENT CONTROL WITH LOCKING DEVICE SHALL BE ACCESSABLE FROM THE TOP OF THE POWER SUPPLY WITH TOP COVER REMOVED. THE SHAFT END OF THE CONTROLS MAY NOT EXTEND PAST THE OUTSIDE OF THE POWER SUPPLY. EXACT LOCATION OF THE ABOVE CONTROLS TO BE DETERMINED BY SUPPLIER. THE CONTROLS SHALL BE SUITABLY IDENTIFIED.

COOLING: CONVECTION

ISOLATION: POWER INPUT, OUTPUT AND CHASSIS SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

THE SUPPLIERS NAME, ADDRESS, AND PART NUMBERS OF THE SUPPLY SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR OF THE POWER SUPPLY. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

TWO COPIES OF INSTRUCTION AND MAINTENANCE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT.

THE POWER SUPPLY SHALL PASS ALL THE TESTS CALLED OUT IN ATP 1900029.

THE REAR FACE OF THE FRONT PANEL SHALL BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

WEIGHT: MUST NOT EXCEED 50 LBS.

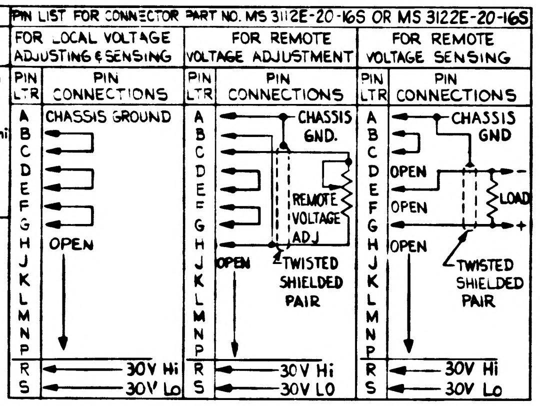
ALL FRONT PANEL LAMPS SHALL BE COVERED WITH A GREEN LENS.

1▷ OUTSIDE SURFACES MUST BE FREE FROM BURRS AND SHARP EDGES. SIDES OF CHASSIS LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .062 INCH AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062 INCH. 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. CENTRALIZATION TO BE MEASURED AT A POINT LOCATED ON EACH CHASSIS SIDE SURFACE, ½ INCH FROM BACK SIDE OF FRONT PANEL, AND ½ INCH FROM BOTTOM SURFACE OF CHASSIS

2▷ FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY TWO COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595. (NOTE MIL-P-8585 PRIMER SUPERSEDES MIL-P-6889)

4▷

PIN LIST		
CONNECTOR PART NO	PIN LTR	PIN CONNECTION
MS 3112E-16-8P OR MS 3122E-16-8P	A	CHASSIS GRD
	B	OPEN
	C	OPEN
	D	115 VAC INPUT hi
	E	115 VAC Lo
	F	OPEN
	G	OPEN
	H	OPEN



PIN LIST FOR CONNECTOR PART NO. MS 3112E-20-16S OR MS 3122E-20-16S					
FOR LOCAL VOLTAGE ADJUSTING & SENSING		FOR REMOTE VOLTAGE ADJUSTMENT		FOR REMOTE VOLTAGE SENSING	
PIN LTR	PIN CONNECTIONS	PIN LTR	PIN CONNECTIONS	PIN LTR	PIN CONNECTIONS
A	CHASSIS GROUND	A	CHASSIS GND.	A	CHASSIS GND
B		B		B	
C		C		C	
D		D		D	OPEN
E		E	REMOTE VOLTAGE ADJ	E	
F		F		F	OPEN
G		G		G	LOAD
H	OPEN	H		H	OPEN
J		J	OPEN TWISTED SHIELDED PAIR	J	TWISTED SHIELDED PAIR
K		K		K	
L		L		L	
M		M		M	
N		N		N	
P		P		P	
R	30V Hi	R	30V Hi	R	30V Hi
S	30V Lo	S	30V LO	S	30V Lo

5▷ CHARACTERS PER ND 1002019 (FUTURA DEMIBOLD). CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN USING ENAMEL SEMI-GLOSS, INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

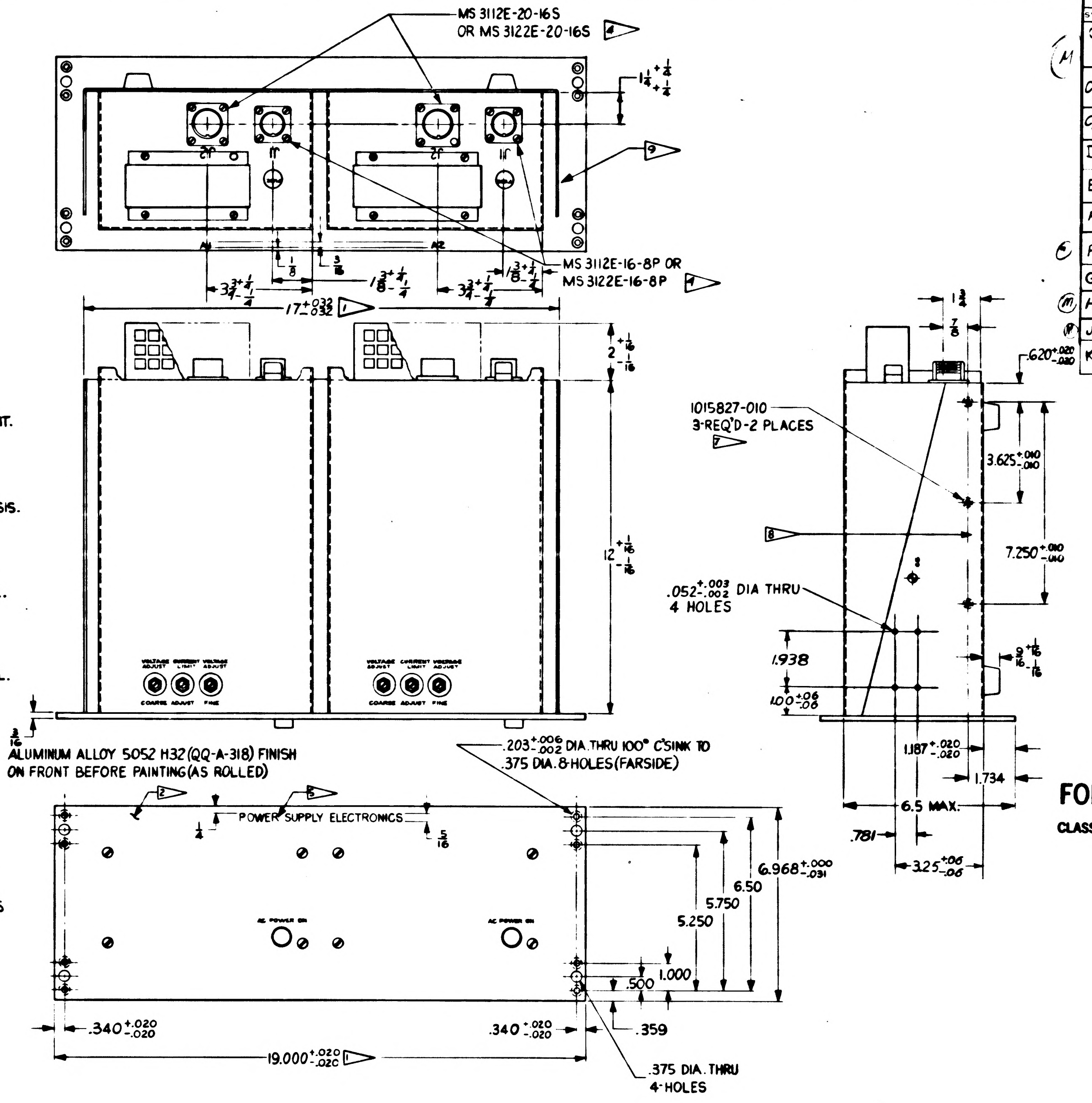
7▷ MOUNT NUT 1015827-010 FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{3}{8}$ INCH SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

8▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. IN THIS AREA THE CHASSIS SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE POWER SUPPLY WHEN CHASSIS TRACK SLIDES ARE MOUNTED.

9▷ BORDER AREA WITHIN $\frac{3}{16}$ INCH OF PANEL EDGE ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANER AND FREE OF PROTRUSIONS.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DATA SOURCE:
TRYGON ELECTRONICS INC
ROOSEVELT, NEW YORK



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0049 DATE 24 Apr 63

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		REVISED & REDRAWN	S.O. 51405	8 APR 63	
C1		MXC 186036 CHANGES WERE ACCOMPLISHED ON "C" CHANGE		3 JUN 63	JEL
C2		CHANGE IN ACCORDANCE WITH MXC-186732		3 JUN 63	JEL
D		CHANGE IN ACCORDANCE WITH MXC-187428		26 JUNE 63	
E		CHANGE IN ACCORDANCE WITH MXC 187962		12 JUL 63	A.M. CZP
F		CHANGE IN ACCORDANCE WITH MXC 188468		1 AUG 63	JGL
F		INCORPORATES CHANGES C1 THRU F PER TDRR 02575		7 AUG 63	
G		CHANGE IN ACCORDANCE WITH MXC-190068		24 OCT 63	A.K.
H		CHANGE IN ACCORDANCE WITH MXC 192071 PER TDRR 09584		14 NOV 63	
J		REVISED PER TDRR 10228		30 JUN 64	PBR
K		REPLACED WITH CHANGE BY REV L PER TDRR 18660		4 MAY 65	

Ⓚ REPLACED WITH CHANGE BY REV L

						TO BE ASSIGNED	POWER SUPPLY (HR40-5A S594)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900025	900024	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1°
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44284
DRAWN C. LENZ DATE 3 OCT 62
CHECKED Diehl 5 APR 63
APPROVAL Apr 5, 1963
APPROVAL 5 Apr 63
NASA APPROVAL
MIT APPROVAL 24 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY, ELECTRONIC

CODE IDENT NO
SIZE E
1900029
SCALE 1:2
SHEET

NOTICE WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

DOCUMENTS							QUANTITY REQUIRED											END ITEM		
NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-254		K				1							76	1022942-000	PTF CALIBRATION KIT
					H-23-207	DWG	M						✓				1	75	1021640	LIFTING FIXT G&N INST QUAL FIXT/AZ REF. FIXT
					A-23-201		A										1	74	1902431-011	PSA ADAPTER MODULE (CARRY ON)
					N.A.	—	A							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G&N HARNESS HANDL & SHIPPING FIXT.
					A-23-250	DWG	A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G&N
					A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198	—	A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080	—	A									1		64	1900926-011	ROTARY TABLE ASSY
						DWG	K							1	1	1		63	1022934	CABLE W17
																		62		
																		61		
																		60		
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100	—	A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108	—	A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102	—	A							1	1	1		49	1900433-011 *	GSE -J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901933	A	PART OF 1901930										45	1901933-011	GSE PSA-J BOX
		1021035		1900005	C-23-411	—	A							1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G&N ASSY
		1021035		1900005	N.A.	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404	—	A							1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500	—	A							1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					C-23-425	—	R							1				35	1020393	INTERCONNECT KIT P&M
					C-23-403	—	R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501	1020342	R					1		1				33	1020342	AGC/CTS OPEPATION CONSOLE
					C-23-402	—	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	—	R					1		1				31	1020339	MOUNTING KIT
					C-23-424	—	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G&N
					C-23-423	—	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-190		R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720-011	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	—	R							1		1		4	1014061	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR -17571			3-15-65	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK
AK		REVISED PER TDRR 18999	F.P.G		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-13-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900224	MECH. DWG, PSA ADAPTER MODULE (CARRY ON)	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S.S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

AG

THIS SHEET ADDED

BLOCK I

50 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 2-4-65
CHECKED
APPROVED
APPROVED 3/9/65
APPROVED MIT 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 2 OF 7

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	MISC	MANUAL	N D	F T M	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
					A-23-204	1019926	K				1							84	1019926-011	G&N FIXTURE STAND
					A-23-254		K				1							83	1022942-011	PTF CALIBRATION KIT
					A-23-252	1019962	K				1							82	1019962-011	AUX PTF STAND
		ND1021039			H-23-209	DWG	A						✓					81	1902430-011	COVER SET, ELECTRICAL CONN.
		ND1021039			H-23-208	DWG	R						✓					80	1020423	CONNECTOR COVERS (AGC)
		ND1021039			A-23-042		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND1021039			H-23-206		K						✓					78	TBA	OUA PURGE VALVE COVERS
		ND1021039			S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
		ND1021039			H-23-194		K						✓				1	76	1022970-011	CONNECTOR COVERS (OPTICS)
		ND1021039			A-23-166		K						✓				1	75	1022880	OPTICS COVERS
		ND1021040			A-23-203	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR TEST FIXTURE
		ND1021040			A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
		ND1021039			H-23-185	DWG	A						✓	1	1		1	72	1901846-021	G&N HARNESS HANDL. & SHIPPING FIXTURE
					A-23-250	DWG	A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G&N
		ND1021039			A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND1021039			S-23-101	1901492	A										1	68	1901492-021	AUXILIARY BATTERY PACK
		ND1021039			H-23-193	DWG	A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
					A-23-201		A										1	66	1902431-021	PSA ADAPTER MODULE (CARRY ON)
		ND1021040			A-23-167	1901981	A							1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND1021040	1002065		A-23-080	—	A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
																		61		
					H-23-207	DWG	M						✓				1	60	1021640	LIFTING FIXT., G&N INST. QUAL. FIXT./AZ REF. FIXT.
		ND1021040			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND1021040			A-23-100	*	A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND1021040			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND1021040			A-23-094	DWG	A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND1021039			A-23-104	1900802	A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		ND1021040			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND1021040			A-23-101	1900797-021	A						✓	1	1	1		53	1900797-021/031	LOAD & SIGNAL SIMULATOR SET
		ND1021040			A-23-108	DWG	A							1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND1021040			A-23-090	DWG	A							1		1		51	1900606-021	PSA MTG FIXTURE
		ND1021040			A-23-107	1902046	A							1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND1021040			A-23-102	1901959	A							1	1	1		49	1901959-011*	GSE - J BOX OVERHEAD
		ND1021040			A-23-197	DWG.	A								1			48	1900364-061	BLANK PANEL ASSY
		ND1021039			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND1021039			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND1021040			A-23-106	1900268-031	A							1		1		45	1902195-011	GSE/PSA - J BOX
		ND1021040			C-23-411	*	A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND1021040			A-23-093	DWG	A							1	1			43	1902204-011	G&N MTG FIXTURE
		ND1021040			A-23-092	DWG	A							1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND1021040			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		ND1021039			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND1021039			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G&N, ASSY
		ND1021040		190005-031	NA	1900005-031	A											38	1902300-011	OPTICS INERTIAL TEST SET
		ND1021040			C-23-404	*	A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND1021040			C-23-500	*	A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND1021040			C-23-425	DWG	R							1				35	1020393	INTERCONNECT KIT, P&M
		ND1021040		1020344	C-23-403	1014217	R					1		1	1	1		34	1020344	COMP CALIB SYS CONSOLE
		ND1021040		1020342	C-23-501	1020342	R					1		1				33	1014465	AGC/CTS OPERATION CONSOLE
		ND1021040		1020341	C-23-402	1020341	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R							1				31	1020338	MOUNTING KIT
		ND1021040			C-23-424	DWG	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G&N
		ND1021040			C-23-423	DWG	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND1021040			A-23-081	DWG	R							1	1			28	1020343	MAIN DSKY MTG STAND
		ND1021039			H-23-190	DWG	R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		ND1021039			A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND1021039			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND1021040			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		ND1021040			A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND1021040			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
																		21		
		ND1021039			H-23-186	1019720	K						✓					20	1019720-011	OPTICS—NAV BASE, SHIPPING CONTAINER
		ND1021039			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND1021040			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND1021039			A-23-097	1017383	K										1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
		ND1021039			A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND1021040			A-23-111	1017381	K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-110	1017380	K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-077	1017376	K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND1021040			A-23-067	1016951	K							1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
		ND1021040			C-23-502	2010605	K				1							11	1016943-011	FUNCTIONAL TESTER ASSY.
																		10		
		ND1021040			A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE
		ND1021040			H-23-198	DWG	M							1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND1021039			A-23-162	DWG	M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND1021039			H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND1021039			H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11		ND1021040		1014061	C-23-401	1014061	R							1		1		4	1014061-011	COMP. SIMULATOR
		ND1021039			H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND1021039			H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
		ND1021039			H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1-271 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11 P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			5-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.			
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1022866	DIAG. MECH. AZIMUTH REF. FIXTURE	
2900221	DIAG. MECH. PSA ADAPTER MODULE (CARRY ON)	
ND1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND1021041	G&N SYSTEM MANUAL	
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G&N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	
MISCELLANEOUS DOCUMENTS		

Ⓐⓖ THIS SHEET ADDED

BLOCK I
100 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
1000000	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED 3/5/65
APPROVED MIT 3-9-65
APPROVED MSC 3-4-65
DATE

APOLLO G & N GROUND SUPPORT EQUIPMENT

CODE IDENT NO.	SIZE	DRAWING NO.
80230	D	1900030
SCALE —		SHEET 3 OF 7

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NOTES	DOCUMENTS						QUANTITY REQUIRED								END ITEM		
	MISC	MANUAL	N D	F T M	MODEL NO.	P S	PC	271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-204	1019926	K	1							84	1019926-011	G&N FIXTURE STAND
					A-23-254		K	1							83	1022942-011	PTF CALIBRATION KIT
					A-23-252	1019962	K	1							82	1019962-011	AUX PTF STAND
		ND1021039			H-23-209	DWG	A			✓					81	1902430-011	COVER SET, ELECTRICAL CONN.
		ND1021039			H-23-208	DWG	R			✓					80	1020423	CONNECTOR COVERS (AGC)
		ND1021039			A-23-042		R							1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND1021039			H-23-206		K			✓					78	TBA	OUA PURGE VALVE COVERS
		ND1021039			S-23-104		K			✓				1	77	1019984-011	OPTICS CLEANING KIT
		ND1021039			H-23-194		K			✓				1	76	1022970-011	CONNECTOR COVERS (OPTICS)
		ND1021039			A-23-166		K			✓				1	75	1022880	OPTICS COVERS
		ND1021040			A-23-203	1019970	K			✓					74	1019970	STAR — HORIZ SIMULATOR CERT. FIXTURE
		ND1021040			A-23-202	1019977	K				1	1			73	1019977	STAR — HORIZ SIMULATOR
		ND1021039			H-23-185	DWG	A			✓	1	1		1	72	1901846-021	G&N HARNESS HANDL. & SHIPPING FIXTURE
					A-23-250	DWG	A				1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A				1	1			70	1901876-011	HOSE SET GSE COOLANT INTERCONN, G&N
		ND1021039			A-23-114	DWG	A							1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND1021039			S-23-101	1901492	A							1	68	1901492-021	AUXILIARY BATTERY PACK
		ND1021039			H-23-193	DWG	A			✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
					A-23-201		A							1	66	1902431-021	PSA ADAPTER MODULE (CARRY ON)
		ND1021040			A-23-167	1901981	A				1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND1021040	1002065		A-23-080	——	A				1		1		64	1900926-021	ROTARY TABLE ASSY
															63		
															62		
															61		
					H-23-207	DWG	M			✓				1	60	1021640	LIFTING FIXT, G&N INST. QUAL. FIXT./AZ REF. FIXT.
		ND1021040			A-23-98	DWG	A			✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND1021040			A-23-100	*	A				1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND1021040			A-23-105	1900804	A			✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND1021040			A-23-094	DWG	A			✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND1021039			A-23-104	1900802	A			✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		ND1021040			A-23-099	DWG	A			✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND1021040			A-23-101	1900797-021	A			✓	1	1	1		53	1900797-021/031	LOAD & SIGNAL SIMULATOR SET
		ND1021040			A-23-108	DWG	A				1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND1021040			A-23-090	DWG	A				1		1		51	1900606-021	PSA MTG FIXTURE
		ND1021040			A-23-107	1902046	A				1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND1021040			A-23-102	1901959	A				1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
		ND1021040			A-23-197	DWG.	A					1			48	1900364-061	BLANK PANEL ASSY
		ND1021039			S-23-100	1900342	A			✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND1021039			A-23-103	1900299	A			✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND1021040			A-23-106	1900268-031	A				1		1		45	1902195-011	GSE/PSA-J BOX
		ND1021040			C-23-411	*	A				1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND1021040			A-23-093	DWG	A				1	1			43	1902204-011	G&N MTG FIXTURE
		ND1021040			A-23-092	DWG	A				1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND1021040			A-23-091	DWG	A				1		1		41	1900012-011	IMU MTG FIXTURE
		ND1021039			H-23-123	1900010	A			✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND1021039			H-23-122	DWG	A			✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G&N, ASSY
		ND1021040		190005-031	NA	1900005-031	A								38	1902300-011	OPTICS INERTIAL TEST SET
		ND1021040			C-23-404	*	A				1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND1021040			C-23-500	*	A				1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND1021040			C-23-425	DWG	R				1				35	1020393	INTERCONNECT KIT, P&M
		ND1021040		1020344	C-23-403	1014217	R		1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE
		ND1021040		1020342	C-23-501	1020342	R		1		1				33	1020342	AGC/CTS OPERATION CONSOLE
		ND1021040		1020341	C-23-402	1020341	R		1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R				1				31	1020338	MOUNTING KIT
		ND1021040			C-23-424	DWG	R		1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G&N
		ND1021040			C-23-423	DWG	R		1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND1021040			A-23-081	DWG	R				1	1			28	1020343	MAIN DSKY MTG STAND
		ND1021039			H-23-190	DWG	R				1	1			27	1020001-003	AGC HANDLING FIXTURE
		ND1021039			A-23-200	1019840	K				1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND1021039			A-23-196	1019837	K	1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND1021040			C-23-593	1019769	K				1	1			24	1019769	SHAFT ACCURACY TESTER
		ND1021040			A-23-109	1019759	K				1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND1021040			A-23-199	1019758	K			✓	1	1			22	1019758	TOOLING BAR ASSY
															21		
		ND1021039			H-23-186	1019720	K			✓					20	1019720-011	OPTICS—NAV BASE, SHIPPING CONTAINER
		ND1021039			H-23-199	1019700	K			✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND1021040			A-23-079	1017447	K			✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND1021039			A-23-097	1017383	K							1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
		ND1021039			A-23-096	1017382	K							1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND1021040			A-23-111	1017381	K				1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-110	1017380	K				2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-077	1017376	K				1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND1021040			A-23-067	1016951	K				1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
		ND1021040			C-23-502	2010605	K	1							11	1016949-011	FUNCTIONAL TESTER ASSY.
															10		
		ND1021040			A-23-095	2010606	K	1							9	1016910-011	PRECISION TEST FIXTURE
		ND1021040			H-23-198	DWG	M				1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND1021039			A-23-162	DWG	M							1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND1021039			H-23-191	DWG	R		1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND1021039			H-23-192	DWG	R		1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11		ND1021040		1014061	C-23-401	1014061	R				1		1		4	1014061-011	COMP. SIMULATOR
		ND1021039			H-23-189	SCD	R			✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND1021039			H-23-187	SCD	R			✓					2	1006230	AGC SHIPPING CONTAINER
		ND1021039			H-23-188	SCD	R			✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1-271 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPOPT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11. P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			5-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.			
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	

MISCELLANEOUS DOCUMENTS		
DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1022866	DIAG. MECH. AZIMUTH REF. FIXTURE	
2900221	DIAG. MECH. PSA ADAPTER MODULE (CARRY ON)	
ND1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND1021041	G&N SYSTEM MANUAL	
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G&N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

(AG) THIS SHEET ADDED

BLOCK I
100 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

APPLICATION	
NEXT ASSY	USED ON
1000000	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED 3/4/65
APPROVED MIT 3-9-65
APPROVED MSC 3-4-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 3 OF 7

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK

NOTES

1. 311 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 321 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 331 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 341 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/ OSS/ G&N/ CSS).
5. 351 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 361 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
7. 371 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.
11. CALIB. SYS CONSOLE CAN BE USED IN LIEU OF AUX. CALIB. SYS CONSOLE.

NOTES	DOCUMENTS						QUANTITY REQUIRED							END ITEM		
	MISC	CMRM	N D	MODEL NO.	P S	P C	371	361	351	341	331	321	311	ITEM NO.	PART NO. IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-256		A						1		88	2900145-011	PTA/PEA TEST POINT ADAPTER
						A								87		CABLE BREAK-OUT BOXES
SEE NOTE 11				C-23-409	2014059	R				1	1	1		86	2014059-011	AUX CALIB SYS CONSOLE
				A-23-255		A				1	1	1		85	2900066-011	PTA/PEA MOUNTING FIXTURE
				S-23-105	2900063	A			✓				1	84	2900063-011	LIFTING TEMP CONTROLLER
MECH DWG 1022868				H-23-194		K			✓				1	83	1022970-011	CONNECTOR COVERS (OPTICS)
				H-23-208	DWG	R			✓				1	82		CONNECTOR COVERS (AGC)
				H-23-209		A			✓				1	81	2900065-011	CONNECTOR COVERS (ISS)
MECH DWG 1019899				A-23-204	1019926	K	1							80	1019926-011	G&N FIXTURE STAND
														79		
				H-23-206		K			✓					78		DUA PURGE VALVE COVERS
MECH DWG 1022864	& 1022870			S-23-104		K			✓				1	77	1019984-011	OPTICS CLEANING KIT
				A-23-254		K	1							76	1022942	PTF CALIBRATION KIT
MECH DWG 1022865				A-23-166		K			✓				1	75	1022880	OPTICS COVERS
MECH DWG 1019883				A-23-203	1019970	K			✓					74	1019970	STAR – HORIZ SIMULATOR CERT FIXTURE
MECH DWG 1019901				A-23-202	1019977	K				1	1			73	1019977	STAR – HORIZ SIMULATOR
														72		
														71		
														70		
				A-23-114		A							1	69		CABLE, INTERCONNECT (NAA-P2 TO IMU)
														68		
														67		
				A-23-258		A						1		66	2900277-011	MOUNTING PLATE, COMPONENT
				A-23-167		A				1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
				A-23-080		A				1		1		64	1900926-021	ROTARY TABLE ASSY
														63		
														62		
						A				1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A				1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-98		A			✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET
														58		
				A-23-105		A			✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
				A-23-094		A			✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
				A-23-104		A			✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
						A								54		
														53		
				A-23-108		A				1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
				A-23-206		A				1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
				A-23-107	1902046	A				1				50	1902046-021	REMOTE OPTICS CONTROLLER
				A-23-192	2900024	A				1	1	1		49	2900024-011*	GUIDANCE DIST BOX
				A-23-197		A					1			48	1900364-061*	BLANK PANEL ASSY.
				S-23-100		A			✓	1	1	1	1	47	2900060-011	INERTIAL COMP. TEMP. CONTROLLER
				A-23-103	2010602	A			✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY.
				H-23-207		M			✓				1	45	1021640	LIFTING SLING, G & N INST. QUAL. FIXT./AZ REF FIXT.
				C-23-411		A				1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE
				A-23-093		A				1	1			43	2900067-011	G&N MTG FIXTURE
				A-23-092		A				1	1			42	2900012-011	OPTICS MTG FIXTURE
				A-23-091		A				1		1		41	2900000-011	IMU MTG FIXTURE
				H-23-123		A			✓					40	1900010-021	IMU SHIPPING CONTAINER
				H-23-122		A			✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G&N, ASSY.
				NA		A								38	2900022-011	OPTICS INERTIAL TEST SET
				C-23-404		A				1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYZER
1900000-011 USABLE				C-23-500		A				1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
				C-23-425	DWG	R				1				35		INTERCONNECT KIT, P & M
SEE NOTE 11				C-23-403	2014049	R		1	✓					34	2014049-011	COMP CALIB SYS CONSOLE
				C-23-501	TBA	R		1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE
				C-23-402	TBA	R		1		1	1			32	2014042-011	AGC TEST SET
														31		
				C-23-424	TBA	R		1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G&N
				C-23-423	DWG	R		1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS.
				A-23-081		R				1	1			28	2014014-011	DSKY MTG STAND
				H-23-190	DWG	R			✓	1	1			27	2014282-011	AGC HANDLING FIXTURE
				A-23-200		K				1	1		1	26	1019840	RETRO REFLECTING PRISM
				A-23-196		K	1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
				C-23-593		K				1	1			24	1019769	SHAFT ACCURACY TESTER
				A-23-109	1019759	K				1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
				A-23-199		K			✓	1	1			22	1019758	TOOLING BAR ASSY.
				A-23-252	1019962	K	1							21	1019962-011	AUX PTF STAND
MECH. DWG 1022903														20		
				H-23-199		K			✓					19		SHIPPING & STORAGE CONTAINER, OPT UNIT
				A-23-079		K			✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
				A-23-097		K							1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
MECH DWG 1022866	& 1022902			A-23-096		K							1	16		AZIMUTH REFERENCE FIXTURE
				A-23-111		K				1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY.
				A-23-110		K				2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY.
				A-23-077		K				1	1			13	1017376	WEDGE, VARIABLE DEVIATION
				A-23-067		K				1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
MECH DWG 1019890				C-23-502	2010605	K	1							11	1016949-011	FUNCTIONAL TESTER ASSY.
														10		
				A-23-095	2010606	K	1							9	1016910-011	PRECISION TEST FIXTURE
				H-23-198		A				1	1	1		8	2900064-011	IMU LIFTING FIXTURE
				A-23-162		A							1	7		JUMPER BY-PASS ASSY, COOLANT FL.
														6		
				H-23-192	DWG	R		1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
				C-23-401	2014048	R				1		1		4	2014048-011	COMP. SIMULATOR
														3		
				H-23-187	SCD	R			✓					2	1006421	AGC SHIPPING CONTAINER
				H-23-188	SCD	R			✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	II, LEM
2900225	MECH. DIAG., TEST POINT ADAPTER	II, LEM
2014022	MECH. DIAG., AGC TEST SET	I, II, LEM
2014021	MECH. DIAG., AGC SIMULATOR	I, II, LEM
2014020	MECH. DIAG., AGC/CTS OPER. CONSOLE	I, II, LEM
2014019	MECH. DIAG., AUX. CALIB. SYS. CONSOLE	I, II, LEM
2014018	MECH. DIAG., AGC. CALIB. SYS. CONSOLE	I, II, LEM
2900224	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/0, I/50
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	I/100, II, LEM
2900221	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/100
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	II, LEM
2900216	MECH. DIAG., OPTICS CONTROL	I/100, II
2900214	MECH. DIAG., GROUNDING	I/100, II
2900213	MECH. DIAG., GROUNDING	II, LEM
2900210	MECH. DIAG., AC POWER PROTECTION & POWER DIST.	I/100, II, LEM
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	I/100, II, LEM
2900206	MECH. DIAG., TEST SELECTOR	I/100, II, LEM
2900202	MECH. DIAG., TEST CONTROL	I/100, II
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900204	MECH. DIAG., TEMP MONITOR & CONTROL	FOR I/100 TESTING ONLY
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	I/100, II, LEM
2900203	MECH. DIAG., TEMP MONITOR & CONTROL PANEL	II, LEM
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	I/100, II, LEM
2900219	MECH. DIAG., COUNTER SIGNAL COLLECTION	I/100, II, LEM
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	I/100, II, LEM
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	I/100, II, LEM
2900215	MECH. DIAG., MEASUREMENTS REF. POWER SUPPLIES	I/100, II, LEM
2900212	MECH. DIAG., PIP & IRIG MONITORING	I/100, II, LEM
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	I/100, II, LEM
2900205	MECH. DIAG., PORT TEMP CONTROLLER	I/100, II, LEM
2900207	MECH. DIAG., MONITOR PANEL	I/100, II, LEM
2900201	MECH. DIAG., TEST CONTROL PANEL	II, LEM
2900200	MECH. DIAG., GYRO CAGING PANEL	I/100, II, LEM

MISCELLANEOUS DOCUMENTS

THIS SHEET ADDED

BLOCK II

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R.A. Jones 3-19-65
CHECKED 5/18/65
APPROVED
APPROVED C. Sparling 5/18/65
APPROVED MIT 2 Jun 65
APPROVED MSC 6/7/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N GROUND SUPPORT EQUIPMENT

CODE IDENT NO.	SIZE	DRAWING NO.
80230	D	1900030

SCALE —
SHEET 4 OF 7

1900030AB

NOTES:

1. 011 CONFIGURATION - COMPLETE SET OF GSE
2. 021 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIP (AGE) TESTING.
4. 041 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (IGS/OSS/AGE).
5. 051 CONFIGURATION - FACILITY ASSIGNED EQUIPMENT NOT ASSOCIATED WITH SPECIFIC TESTS. QUANTITIES REQUIRED VARY WITH FACILITY & MUST BE SPECIFIED INDEPENDENTLY FOR EACH COMPONENT IN THIS SET.
6. VENDOR ITEM - SEE SPECIFACATION CONTROL DRAWING.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Y		REPLACES REV. W WITH CHANGE PER CM195220. ADDED CUSTOMER DATA (V2-64) REVISED PER TDR		25 APR 64	MB PJ
Z		CHANGE IN ACCORDANCE WITH CM-195280 TDRR 09268	—	11 MAY 64	WR 27 May WK
AA		CHANGE IN ACCORDANCE WITH CM 197091 TDRR 10035	—	8 JUNE 64	BK RWT
AB		CHANGE IN ACCORDANCE WITH CM 197315 Per TDRR 11563	—	10 JUN 64	JHR EF

Ⓨ REPLACES REV. W WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 DATE 24 Apr 63

SEE NOTE 6

QUANTITY REQUIRED 051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		1	1		54	1901663-021	TUBING ASSEMBLY, PLASTIC
	1	1		1		53	1901663-011	TUBING ASSEMBLY, PLASTIC
AR				1		52	1901520	CABLE INTERCONNECT (NAA-P2 TO IMU)
AR				1		51	1901426-011	OPTICS/NAV. BASE HANDLING FIXTURE
AR				1		50	1901415-011	SWITCHING UNIT, TRANSFER
AR				1		49	1901492-011	AUXILIARY BATTERY PACK
		1				48	1900364-061	BLANK PANEL ASSY
	RAY	RAY		RAY		47	1014465	AGC/CTS OPERATION CONSOLE
	6	6	2	6		46	1900866-011	HOSE, COOLANT, INTERCONNECT M-F
	2		2	2		45	1900866-021	HOSE, COOLANT, INTERCONNECT M-F
	1	1		1		44	1900867-011	HOSE, COOLANT, INTERCONNECT F-F
	1		1	1		43	1900867-021	HOSE, COOLANT, INTERCONNECT F-F
AR				1		42	1900800-011	IMU MTG. FIXTURE ALIGNMENT SET
AR				1		41	1900810-011	ROTARY TABLE CALIBRATION KIT
AR				1		40	1900811-011	G&N HARNESS SHIPPING FIXTURE
AR				1		37	1900797-011	SIMULATOR SET, LOAD & SIGNAL
AR				1		36	1900804-011	IMU PRESSURE SEAL TESTER
AR				1		35	1900803-011	FILLING & PURGING FIXTURE
AR				1		34	1900802	BELLOWS, IMU SNAP-ON
RAY				RAY		33	1014217	AGC CALIBRATION CONSOLE
AR				1		32	1900342-011	INERTIAL COMP. TEMP CONTROLLER ASSY.
AR				1		31	1900009-011	G&N TRANSPORT CART
	1			1		30	1900491-011	REMOTE OPTICS CONTROLLER
						29		
	1		1	1		28	1900606-011	PSA MOUNTING FIXTURE
	1		1	1		27	1900268-011	GSE-PSA JUNCTION BOX ASS'Y
	1			1		26	1900013-011	OPTICS/NB MOUNTING FIXTURE ASSEMBLY
	1	1		1		25	1900014-011	G&N MOUNTING FIXTURE
	1		1	1		24	1900012-011	IMU MOUNTING FIXTURE
AR				1		23	1900299-011	DEGAUSSER ASSEMBLY
				REF		22	1900258	TEST CONTROL MECHANIZATION
				REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM TEST INTERFACE MECHANIZATION
				REF		20	1900144	GSE PWR CONT & DISTR MECHANIZATION
				REF		19	1900089	MECHANIZATION DIAG-GSE SYS & SUBSYSTEM MON-DISPLAY & CONTROLS
				REF		18	1900077	GSE COUNTER SIGNAL SELECT MECHANIZATION
						17		
				REF		16	1900100	GSE OPTICS TEST MECHANIZATION
AR				1		15	1900010-011	IMU SHIPPING CONTAINER
				REF		14	1900066	AGE-GSE SIGNAL SELECTION MECHANIZATION DIAGRAM
				REF		13	1900065	AGE-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.
FT	FT	FT	FT	FT		12	1900019	FAMILY TREE
	RAY	RAY		RAY		11	1014156	AGC-TEST SET ASSY
						10		
						9		
						8		
	RAY		RAY	RAY		7	1014061	DRAWER ASSY COMPUTER SIMULATOR
	1	1	1	1		6	1900005-011	OPTICS INERTIAL TEST SET
	1		1	1		5	1900926-011	ROTARY TABLE
				KIC		4	1017400	OPTICS TEST EQUIPMENT
						3		
						2		
						1		

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — — DECIMALS + — — — ANGLES + — — —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-437

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 1 APR 63
MALIKOWSKI 1 APR 63
CHECKED
APPROVAL H. BRINKMAN 1 APR 63
APPROVAL
5-27-64
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO. SIZE D 1900030
SCALE — SHEET 1 OF 1

NOTES:

1. 011 CONFIGURATION - COMPLETE SET OF GSE
2. 021 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT SOLELY INERTIAL SUB SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIP (AGE) TESTING.
4. 041 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N).
5. 051 CONFIGURATION - FACILITY ASSIGNED EQUIPMENT NOT ASSOCIATED WITH SPECIFIC TESTS. QUANTITIES REQUIRED VARY WITH FACILITY & MUST BE SPECIFIED INDEPENDENTLY FOR EACH COMPONENT IN THIS SET.
6. ~~VENDOR ITEM - SEE SPECIFACATION CONTROL DRAWING.~~
7. 061 CONFIGURATION - SAME AS 021 AND GYRO CAGING
8. 071 CONFIGURATION - SAME AS 031 AND GYRO CAGING
9. 081 CONFIGURATION - SAME AS 041 AND GYRO CAGING

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
Y		REPLACES REV. W WITH CHANGE PER CM195220. ADDED CUSTOMER DATA (V2-64) REVISED PER TDR		25 APR 64	MB PJ
Z		CHANGE IN ACCORDANCE WITH CM-195280 TDRR 09268	—	11 MAY 64	WK 17 May WK
AA		CHANGE IN ACCORDANCE WITH CM 197091 TDRR 10035	—	8 JUNE 64	BK RW
AB		CHANGE IN ACCORDANCE WITH CM 197315 PER TDRR 11563	—	10 JUN 64	JHR EF
AC		CHANGE IN ACCORDANCE WITH CM 199880 TDER 13410	—	1 SEPT 64	JHR PJ

~~SEE NOTE 6~~

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		1		1		1	1		54	1901663-021	TUBING ASSEMBLY, PLASTIC
1	1			1	1		1		53	1901663-011	TUBING ASSEMBLY, PLASTIC
			AR				1		52	1901520	CABLE INTERCONNECT (NAA-P2 TO IMU)
			AR				1		51	1901426-011	OPTICS/NAV. BASE HANDLING FIXTURE
			AR				1		50	1901415-011	SWITCHING UNIT, TRANSFER
			AR				1		49	1901492-011	AUXILIARY BATTERY PACK
	1				1				48	1900364-061	BLANK PANEL ASSY
RAY	RAY			RAY	RAY		RAY		47	1014465	AGC/CTS OPERATION CONSOLE
6	6	2		6	6	2	6		46	1900866-011	HOSE, COOLANT, INTERCONNECT M-F
2		2		2		2	2		45	1900866-021	HOSE, COOLANT, INTERCONNECT M-F
1	1			1	1		1		44	1900867-011	HOSE, COOLANT, INTERCONNECT F-F
1		1		1		1	1		43	1900867-021	HOSE, COOLANT INTERCONNECT F-F
			AR				1		42	1900800-011	IMU MTG. FIXTURE ALIGNMENT SET
			AR				1		41	1900810-011	ROTARY TABLE CALIBRATION KIT
			AR				1		40	1900811-011	G&N HARNESS SHIPPING FIXTURE
			AR				1		37	1900797-011	SIMULATOR SET, LOAD & SIGNAL
			AR				1		36	1900804-011	IMU PRESSURE SEAL TESTER
			AR				1		35	1900803-011	FILLING & PURGING FIXTURE
			AR				1		34	1900802	BELLOWS, IMU SNAP-ON
			RAY				RAY		33	1014217	AGC CALIBRATION CONSOLE
			AR				1		32	1900342-011	INERTIAL COMP TEMP CONTROLLER ASSY.
			AR				1		31	1900009-011	G & N TRANSPORT CART
1				1			1		30	1900491-011	REMOTE OPTICS CONTROLLER
1		1					1		29	1900268-021	GSE-PSA JUNCTION BOX ASSY.
1		1		1		1	1		28	1900606-011	PSA MOUNTING FIXTURE
				1		1			27	1900268-011	GSE-PSA JUNCTION BOX ASS'Y
1				1			1		26	1900013-011	OPTICS/NB MOUNTING FIXTURE ASSEMBLY
1	1			1	1		1		25	1900014-011	G&N MOUNTING FIXTURE
1		1		1		1	1		24	1900012-011	IMU MOUNTING FIXTURE
			AR				1		23	1900299-011	DEGAUSSER ASSEMBLY
							REF		22	1900258	TEST CONTROL MECHANIZATION
QUANTITY REQUIRED									LIST OF PARTS AND MATERIALS		

Ⓨ REPLACES REV. W WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 **DATE** 24 Apr 63

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
							REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM TEST INTERFACE MECHANIZATION
							REF		20	1900144	GSE PWR CONT & DISTR MECHANIZATION
							REF		19	1900089	MECHANIZATION DIAG-GSE SYS & SUBSYSTEM MON-DISPLAY & CONTROLS
							REF		18	1900077	GSE COUNTER SIGNAL SELECT MECHANIZATION
									17		
							REF		16	1900100	GSE OPTICS TEST MECHANIZATION
			AR				1		15	1900010-011	IMU SHIPPING CONTAINER
							REF		14	1900066	AGE-GSE SIGNAL SELECTION MECHANIZATION DIAGRAM
							REF		13	1900065	AGE-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.
FT	FT	FT	FT	FT	FT	FT	FT		12	1900019	FAMILY TREE
RAY	RAY			RAY	RAY		RAY		11	1014156	AGC-TEST SET ASSY
									10		
									9		
1	1	1					1		8	1900005-021	OPTICS INERTIAL TEST SET
RAY		RAY		RAY		RAY	RAY		7	1014061	DRAWER ASSY COMPUTER SIMULATOR
				1	1	1			6	1900005-011	OPTICS INERTIAL TEST SET
1		1		1		1	1		5	1900926-011	ROTARY TABLE
							KIC		4	1017400	OPTICS TEST EQUIPMENT
									3		
									2		
									1		
QUANTITY REQUIRED									LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-437

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 1 APR 63
CHECKED MALIKOWSKI 1 APR 63
APPROVAL H. BRINKMAN 1 APR 63
APPROVAL
NASA APPROVAL 5-27-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO
SIZE D
1900030
SCALE —
SHEET 1 OF 1

1900030AD

NOTES:
1. 011 CONFIGURATION - COMPLETE SET OF GSE
2. 021 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT SOLELY INERTIAL SUB SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIP (AGE) TESTING.
4. 041 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N).
5. 051 CONFIGURATION - FACILITY ASSIGNED EQUIPMENT NOT ASSOCIATED WITH SPECIFIC TESTS. QUANTITIES REQUIRED VARY WITH FACILITY & MUST BE SPECIFIED INDEPENDENTLY FOR EACH COMPONENT IN THIS SET.
~~6. VENDOR ITEM - SEE SPECIFACATION CONTROL DRAWING.~~
7. 061 CONFIGURATION - SAME AS 021 AND GYRO CAGING
8. 071 CONFIGURATION - SAME AS 031 AND GYRO CAGING
9. 081 CONFIGURATION - SAME AS 041 AND GYRO CAGING

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
Y		REPLACES REV. W WITH CHANGE PER CM195220. ADDED CUSTOMER DATA (V2-64) REVISED PER TDR		25 APR 64	MB PJ
Z		CHANGE IN ACCORDANCE WITH CM-195280 TDRR 09268	—	11 MAY 64	WK 27 May WK
AA		CHANGE IN ACCORDANCE WITH CM 197091 TDRR 10035	—	8 JUNE 64	BK Rwf
AB		CHANGE IN ACCORDANCE WITH CM 197315 PER TDRR 11563	—	10 JUN 64	JHR EF
AC		CHANGE IN ACCORDANCE WITH CM 199880 TDRR 13410	—	1 SEPT 64	JHR PJ
AD		REVISED PER TDRR 13409		20 OCT 64	JWP

~~SEE NOTE 6~~

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		1		1		1	1		54	1901663-021	TUBING ASSEMBLY, PLASTIC
1	1			1	1		1		53	1901663-011	TUBING ASSEMBLY, PLASTIC
			AR				1		52	1901520	CABLE INTERCONNECT (NAA-P2 TO IMU)
			AR				1		51	1901426-011	OPTICS/NAV. BASE HANDLING FIXTURE
			~~AR~~				~~1~~		~~50~~	~~1901415-011~~	~~SWITCHING UNIT, TRANSFER~~
			AR				1		49	1901492-011	AUXILIARY BATTERY PACK
	1				1				48	1900364-061	BLANK PANEL ASSY
RAY	RAY			RAY	RAY		RAY		47	1014465	AGC/CTS OPERATION CONSOLE
6	6	2		6	6	2	6		46	1900866-011	HOSE, COOLANT, INTERCONNECT M-F
2		2		2		2	2		45	1900866-021	HOSE, COOLANT, INTERCONNECT M-F
1	1			1	1		1		44	1900867-011	HOSE, COOLANT, INTERCONNECT F-F
1		1		1		1	1		43	1900867-021	HOSE, COOLANT, INTERCONNECT F-F
			AR				1		42	1900800-011	IMU MTG. FIXTURE ALIGNMENT SET
			AR				1		41	1900810-011	ROTARY TABLE CALIBRATION KIT
			AR				1		40	1900811-011	G&N HARNESS SHIPPING FIXTURE
			AR				1		37	1900797-011	SIMULATOR SET, LOAD & SIGNAL
			AR				1		36	1900804-011	IMU PRESSURE SEAL TESTER
			AR				1		35	1900803-011	FILLING & PURGING FIXTURE
			AR				1		34	1900802	BELLOWS, IMU SNAP-ON
			RAY				RAY		33	1014217	AGC CALIBRATION CONSOLE
			AR				1		32	1900342-011	INERTIAL COMP. TEMP CONTROLLER ASSY.
			AR				1		31	1900009-011	G&N TRANSPORT
											CART
1				1			1		30	1900491-011	REMOTE OPTICS CONTROLLER
1		1					1		29	1900268-021	GSE-PSA JUNCTION BOX ASSY.
1		1		1		1	1		28	1900606-011	PSA MOUNTING FIXTURE
				1		1			27	1900268-011	GSE-PSA JUNCTION BOX ASS'Y
1				1			1		26	1900013-011	OPTICS/NB MOUNTING FIXTURE
											ASSEMBLY
1	1			1	1		1		25	1900014-011	G&N MOUNTING FIXTURE
1		1		1		1	1		24	1900012-011	IMU MOUNTING FIXTURE
			AR				1		23	1900299-011	DEGAUSSER ASSEMBLY
							REF		22	1900258	TEST CONTROL MECHANIZATION

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

Ⓨ REPLACES REV."W" WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 DATE 24 apr 63

081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
							REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM
											TEST INTERFACE MECHANIZATION
							REF		20	1900144	GSE PWR CONT & DISTR
											MECHANIZATION
							REF		19	1900089	MECHANIZATION DIAG-GSE SYS &
											SUBSYSTEM MON-DISPLAY & CONTROLS
							REF		18	1900077	GSE COUNTER SIGNAL SELECT
											MECHANIZATION
									17		
							REF		16	1900100	GSE OPTICS TEST MECHANIZATION
			AR				1		15	1900010-011	IMU SHIPPING CONTAINER
							REF		14	1900066	AGE-GSE SIGNAL SELECTION
											MECHANIZATION DIAGRAM
							REF		13	1900065	AGE-GSE GROUNDING & ISOLATION
											INTERFACE MECH. DIAG.
FT	FT	FT	FT	FT	FT	FT	FT		12	1900019	FAMILY TREE
RAY	RAY			RAY	RAY		RAY		11	1014156	AGC-TEST SET ASSY
									10		
									9		
1	1	1					1		8	1900005-021	OPTICS INERTIAL TEST SET
RAY		RAY		RAY		RAY	RAY		7	1014061	DRAWER ASSY COMPUTER SIMULATOR
				1	1	1			6	1900005-011	OPTICS INERTIAL TEST SET
1		1		1		1	1		5	1900926-011	ROTARY TABLE
							KIC		4	1017400	OPTICS TEST EQUIPMENT
									3		
									2		
									1		

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − — DECIMALS + − — ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-437

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 1 APR 63
MALIKOWSKI CHECKED 1 APR 63
APPROVAL H. BRINKMAN 1 APR 63
APPROVAL 5-27-6[illegible]
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO. — SIZE D — 1900030
SCALE — SHEET 1 OF 1

1900030 AE

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Y		REPLACES REV. W WITH CHANGE PER CM195220. ADDED CUSTOMER DATA (V2-64) REVISED PER TDR		25 APR 64	MB P7
Z		CHANGE IN ACCORDANCE WITH CM-195280 TDRR 09268	—	11 MAY 64	WK 27 May WK
AA		CHANGE IN ACCORDANCE WITH CM 197091 TDRR 10035	—	8 JUNE 64	BK
AB		CHANGE IN ACCORDANCE WITH CM 197315 PER TDRR 11563	—	10 JUN 64	JHR EF
AC		CHANGE IN ACCORDANCE WITH CM 199880 TDRR 13410	—	1 SEPT 64	JHR P7
AD		REVISED PER TDRR 13409		20 OCT 64	JWP
AE		REVISED PER TDRR 13411		21 OCT 64	JWP

NOTES:

1. 011 CONFIGURATION - COMPLETE SET OF GSE
2. 021 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT SOLELY INERTIAL SUB SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIP (AGE) TESTING.
4. 041 CONFIGURATION - EQUIPMENT (LESS GYRO CAGING) REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N).
5. 051 CONFIGURATION - FACILITY ASSIGNED EQUIPMENT NOT ASSOCIATED WITH SPECIFIC TESTS. QUANTITIES REQUIRED VARY WITH FACILITY & MUST BE SPECIFIED INDEPENDENTLY FOR EACH COMPONENT IN THIS SET.
6. ~~VENDOR ITEM - SEE SPECIFACATION CONTROL DRAWING.~~
7. 061 CONFIGURATION - SAME AS 021 AND GYRO CAGING
8. 071 CONFIGURATION - SAME AS 031 AND GYRO CAGING
9. 081 CONFIGURATION - SAME AS 041 AND GYRO CAGING

~~SEE NOTE 6~~

QUANTITY REQUIRED											
081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		1		1		1	1		54	1901663-021	TUBING ASSEMBLY, PLASTIC
1	1			1	1		1		53	1901663-011	TUBING ASSEMBLY, PLASTIC
			AR				1		52	1901520	CABLE INTERCONNECT (NAA-P2 TO IMU)
			AR				1		51	1901426-011	OPTICS/NAV. BASE HANDLING FIXTURE
			~~AR~~				~~1~~		~~50~~	~~1901415-011~~	~~SWITCHING UNIT, TRANSFER~~
			AR				1		49	1901492-011	AUXILIARY BATTERY PACK
	1				1				48	1900364-061	BLANK PANEL ASSY
RAY	RAY			RAY	RAY		RAY		47	1014465	AGC/CTS OPERATION CONSOLE
6	6	2		6	6	2	6		46	1900866-011	HOSE, COOLANT, INTERCONNECT M-F
2		2		2		2	2		45	1900866-021	HOSE, COOLANT, INTERCONNECT M-F
1	1			1	1		1		44	1900867-011	HOSE, COOLANT, INTERCONNECT F-F
1		1		1		1	1		43	1900867-021	HOSE, COOLANT, INTERCONNECT F-F
			AR				1		42	1900800-011	IMU MTG. FIXTURE ALIGNMENT SET
			AR				1		41	1900810-011	ROTARY TABLE CALIBRATION KIT
			AR				1		40	1901846-011	G&N HARNESS HANDLING AND
											INSTALLATION FIXTURE.
			AR				1		37	1900797-011	SIMULATOR SET, LOAD & SIGNAL
			AR				1		36	1900804-011	IMU PRESSURE SEAL TESTER
			AR				1		35	1900803-011	FILLING & PURGING FIXTURE
			AR				1		34	1900802	BELLOWS, IMU SNAP-ON
			RAY				RAY		33	1014217	AGC CALIBRATION CONSOLE
			AR				1		32	1900342-011	INERTIAL COMP. TEMP CONTROLLER ASSY.
			AR				1		31	1900009-011	G&N TRANSPORT
											CART
1				1			1		30	1900491-011	REMOTE OPTICS CONTROLLER
1		1					1		29	1900268-021	GSE-PSA JUNCTION BOX ASSY.
1		1		1		1	1		28	1900606-011	PSA MOUNTING FIXTURE
				1		1			27	1900268-011	GSE-PSA JUNCTION BOX ASS'Y
1				1			1		26	1900013-011	OPTICS/NB MOUNTING FIXTURE
											ASSEMBLY
1	1			1	1		1		25	1900014-011	G&N MOUNTING FIXTURE
1		1		1		1	1		24	1900012-011	IMU MOUNTING FIXTURE
			AR				1		23	1900299-011	DEGAUSSER ASSEMBLY
							REF		22	1900258	TEST CONTROL MECHANIZATION

LIST OF PARTS AND MATERIALS

Ⓨ REPLACES REV."W" WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 **DATE** 24 apr 63

QUANTITY REQUIRED											
081	071	061	051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
							REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM
											TEST INTERFACE MECHANIZATION
							REF		20	1900144	GSE PWR CONT & DISTR
											MECHANIZATION
							REF		19	1900089	MECHANIZATION DIAG-GSE SYS &
											SUBSYSTEM MON-DISPLAY & CONTROLS
							REF		18	1900077	GSE COUNTER SIGNAL SELECT
											MECHANIZATION
									17		
							REF		16	1900100	GSE OPTICS TEST MECHANIZATION
			AR				1		15	1900010-011	IMU SHIPPING CONTAINER
							REF		14	1900066	AGE-GSE SIGNAL SELECTION
											MECHANIZATION DIAGRAM
							REF		13	1900065	AGE-GSE GROUNDING & ISOLATION
											INTERFACE MECH. DIAG.
FT	FT	FT	FT	FT	FT	FT	FT		12	1900019	FAMILY TREE
RAY	RAY			RAY	RAY		RAY		11	1014156	AGC-TEST SET ASSY
									10		
									9		
1	1	1					1		8	1900005-021	OPTICS INERTIAL TEST SET
RAY		RAY		RAY		RAY	RAY		7	1014061	DRAWER ASSY COMPUTER SIMULATOR
				1	1	1			6	1900005-011	OPTICS INERTIAL TEST SET
1		1		1		1	1		5	1900926-011	ROTARY TABLE
							KIC		4	1017400	OPTICS TEST EQUIPMENT
									3		
									2		
									1		

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-437

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 1 APR 63
CHECKED MALIKOWSKI 1 APR 63
APPROVAL H. BRINKMAN 1 APR 63
APPROVAL
NASA APPROVAL 5-27-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO. SIZE D 1900030
SCALE — SHEET 1 OF 1

MIL 10780-P

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 00995			
SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

PRE-BASELINE

2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓).

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	PS	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-082		A			1		1		1		1		67	1901663-021	TUBING ASSY, PLASTIC
				A-23-082		A			1	1			1	1			66	1901663-011	TUBING ASSY, PLASTIC
				A-23-114		A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
	1021034			A-23-169		A			1		1		1		1		59	1900867-021	HOSE COOLANT INTERCONNET F-F
	1021034			A-23-169		A			1	1			1	1			58	1900867-011	HOSE COOLANT INTERCONNECT F-F
	1021034			A-23-168		A			2		2		2		2		57	1900866-021	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-168		A		2	4	4			4	4			56	1900866-011	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB TOOL SET
	1021034			A-23-101	19000797	A			1	1	1	✓	1	1	1		49	1900797-011	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	19000491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K.						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A 23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

BLOCK I, 0 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. A. Jones DATE JAN 27 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1900030
SCALE — WT SHEET 1 OF 1

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REVISIONS 00995			
SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-66	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3. REVISED PER TDRR 17228 Cal 2/5/66	4/9/65	

NOTES:

PRE-BASELINE

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓).

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MSFC	CMRM	ND	FTM	MODEL NO.	P S	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	1021034			H-23-122	DWG				1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	——	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	——	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-082		A			1		1		1		1		67	1901663-021	TUBING ASSY. PLASTIC
				A-23-082		A			1	1			1	1			66	1901663-011	TUBING ASSY. PLASTIC
				A-23-114		A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	——	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	——	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	——	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
	1021034			A-23-169		A			1		1		1		1		59	1900867-021	HOSE COOLANT INTERCONNET F-F
	1021034			A-23-169		A			1	1			1	1			58	1900867-011	HOSE COOLANT INTERCONNECT F-F
	1021034			A-23-168		A			2		2		2		2		57	1900866-021	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-168		A			4	4			4	4			56	1900866-011	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	——	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802.	A			1	1	1	✓	1	1	1	1	51	1900802	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB. TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	——	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	——	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	——	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	——	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	——	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A 23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	——	R		1	1				1				9	1014465	AGC CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	——	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C 23-402	——	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	——	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

MISCELLANEOUS DOCUMENTS	
DOCUMENT NO.	DOCUMENT DESCRIPTION
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900068	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

BLOCK I, O SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
LIST OF MATERIALS		

APPLICATION	
NEXT ASSY	USED ON
	1000000

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R.A. Jones DATE 1965 Jan 27
CHECKED 2/2/65
APPROVAL
APPROVAL C. Dudley 2/2/65
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. | SIZE D | NASA DRAWING NO. 1900030
SCALE — | WT | SHEET 1 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

	DOCUMENTS						QUANTITY REQUIRED									END ITEM		
NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC		171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
							A					~~1~~	~~1~~	~~1~~		~~73~~	~~1901330 *~~	~~RETROFIT KIT (SERIES 50)~~
		1021034			H-23-185	DWG	A				✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.
					A-23-082		A					1		1		71	1901663-021	TUBING ASSY, PLASTIC
					A-23-082		A					1	1			70	1901663-011	TUBING ASSY. PLASTIC
					A-23-114		A								1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A								1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A				✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198		A					1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A					1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080		A					1		1		64	1900926-011	ROTARY TABLE ASSY
		1021034			A-23-169		A					1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-169		A					1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-168		A					2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-168		A					4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-98	DWG	A				✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100		A					1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A				✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A				✓	1	1	1	1	56	1900303-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A				✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		~~1021034~~			~~A-23-098~~	~~DWG~~	A				✓	1		1		~~54~~	~~1900808-011~~	~~IMU MTG ALIGN CALIB TOOL SET~~
		102 034			A-23-101	1900797	A				✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108		A					1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A					1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A					1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102		A					1	1	1		49	1900433-011 *	GSE-J BOX OVERHEAD
		—			A-23-197	DWG	A						1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A				✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A				✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901333	A	PART OF 1901330								45	1901333-011	GSE PSA-J BOX
		1021035		1900005	C-23-411		A					1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A					1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A					1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A					1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A				✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A				✓	1	1	1		39	1900009-021	TRANSPORTATION CART G & N ASSY
		1021035		1900005	NA	1900005	A									38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404		A					1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500		A					1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					TBA		R					1				35	1020393	INTERCONNECT KIT P & M
					C-23-403	—	R			1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE.
					C-23-501	—	R			1		1				33	1020342	AGC CTS OPERATION CONSOLE
					C-23-402	—	R			1		1	1			32	1020341	AGC TEST SET
					TBA		R			1		1				31	1020339	MOUNTING KIT
					TBA		R			1		1	1			30	1020313	AGC GSE INTERCONNECT KIT. G & N
					TBA		R			1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081	—	R					1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-190		R					1	1			27	1020001-3	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K					1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K		1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K					1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K					1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K				✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K				✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K				✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K				✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K				✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K								1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K								1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K					1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K					2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K					1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K					1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K		1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K		1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K		1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M				✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M								1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R			1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R			1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	—	R					1		1		4	1014061	COMP SIMULATOR
					H-23-189	SCD	R				✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R				✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R				✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S. S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

AG

THIS SHEET ADDED

BLOCK I
50 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Sparling 3/9/65
APPROVED MIT M. W. Morley 3-9-65
APPROVED MSC A C 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. | SIZE D | DRAWING NO. 1900030

SCALE | SHEET 2 OF 3

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DOCUMENTS							QUANTITY REQUIRED											END ITEM		
NOTES	MISC	CMRM	N D	F T M	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					TBA		A						✓					81	TBA	CONNECTOR COVERS
					TBA		R						✓					80	TBA	CONNECTOR COVERS
					TBA		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
					TBA		K						✓					78	TBA	OUA PURGE VALVE COVERS
					TBA		K						✓				1	77	TBA	OPTICS CLEANING KIT
					TBA		K						✓				1	76	TBA	CONNECTOR COVERS
					TBA		K						✓				1	75	TBA	OPTICS COVERS
					TBA		K						✓					74	TBA	STAR & HORIZ SIMULATOR TEST EQUIP.
					TBA		K							1	1			73	TBA	STAR & HORIZ SIMULATOR
					H-23-185		A						✓	1	1		1	72	1901846-021	G & N HARNESS HANDL. & SHIPPING FIXTURE
					A-23-082		A							1		1		71	1901663-021	TUBING ASSY, PLASTIC
					A-23-082		A							1	1			70	1901663-011	TUBING ASSY, PLASTIC
					A-23-114		A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101		A										1	68	1901492-021	AUXILIARY BATTERY PACK
					H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
					A-23-198		A							1	1	1		66	1901308-011*	GSE TO G&N INTERCONNECT CABLES
					A-23-167		A							1	1	1		65	1900931-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
					A-23-169		A							1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F.F.
					A-23-169		A							1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F.F.
					A-23-168		A							2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
					A-23-168		A							4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
					A-23- 98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
					A-23-100		A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1900803-021	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
					[illegible]		A						✓	1		1		54	[illegible]-011	IMU MTG ALIGN CALIB TOOL SET
					A-23-101		A						✓	1	1	1		53	1902023-011	LOAD & SIGNAL SIMULATOR SET
					A-23-108		A							1	1	1		52	1900740-011*	GSE TO GSE INTERCONNECT CABLES
					A-23-090		A							1		1		51	1900606-021	PSA MTG FIXTURE
					A-23-107		A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
					A-23-102		A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
					A-23-197		A								1			48	1900364-061	BLANK PANEL ASSY
					S-23-100		A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
					A-23-103		A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106		A							1		1		45	1902195-011	GSE/PSA-J BOX
					C-23-411		A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
					A-23-093		A							1	1			43	1902204-011	G&N MTG FIXTURE
					A-23-092		A							1	1			42	1902303-011	OPTICS NAV BASE MTG FIXTURE
					A-23-091		A							1		1		41	1900012-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-011	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G & N, ASSY
					NA		A											38	1900005	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
					C-23-500		A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT, P & M
					C-23-403		R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33	1020342	AGC CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32	1020341	AGC TEST SET
					TBA		R							1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
					A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
					H-23-190		R							1	1			27	1020001	AGC HANDLING FIXTURE
					A-23-200		K							1	1		1	26	1019840	RETRO REFLECTING PRISM
					A-23-196		K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
					C-23-593		K							1	1			24	1019769	SHAFT ACCURACY TESTER
					A-23-109		K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
					A-23-199		K						✓	1	1			22	1019758	TOOLING BAR ASSY
					H-23-197		K						✓					21	1019721	CASE ASSY, STORAGE, MAP & DATA VIEWER
					H-23-186		K						✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
					H-23-199		K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
					A-23-079		K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
					A-23-097		K										1	17	1017383	G & N INSTALL. QUALIFICATION FIXTURE
					A-23-096		K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
					A-23-111		K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
					A-23-110		K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
					A-23-077		K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
					A-23-067		K							1	1			12	1016951	ALIGNMENT MIRROR ASSY.
					C-23-502		K				1							11	1016949	FUNCTIONAL TESTER ASSY.
					C-23-421		K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
					A-23-095		K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-138		M							1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162		M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
					H-23-191		R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192		R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401		R							1		1		4	1014061-2	COMP. SIMULATOR
					H-23-189		R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187		R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188		R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED, TDRR 17228	RJ			

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G & N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

Ⓐⓖ THIS SHEET ADDED

BLOCK I
100 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

	1000000
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. a. Jones 2/25/65
CHECKED
APPROVED
APPROVED C. Sarlin 3/4/65
APPROVED MIT M. J. Murley 3-9-65
APPROVED MSC R. C. Mc 3-4-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE D
DRAWING NO. 1900030
SCALE
SHEET 3 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	P S	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	1021034			H-23-122	DWG				1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A 23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-082		A			1		1		1		1		67	1901663-021	TUBING ASSY. PLASTIC
				A-23-082		A			1	1			1	1			66	1901663-011	TUBING ASSY. PLASTIC
				A-23-114		A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
	1021034			A-23-169		A			1		1		1		1		59	1900867-021	HOSE COOLANT INTERCONNET F-F
	1021034			A-23-169		A			1	1			1	1			58	1900867-011	HOSE COOLANT INTERCONNECT F-F
	1021034			A-23-168		A			2		2		2		2		57	1900866-021	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-168		A			4	4			4	4			56	1900866-011	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB. TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A G S E COMPLEMENT OR THEIR COMPONENTS (✓).
6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO. TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

PRE-BASELINE (notes 2–4)
POST-BASELINE (notes 6–8)

REVISIONS 00995

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3 REVISED PER TDRR 17228 Caf 3/9/65	3/9/65	
AH	REVISED PER TDRR - 17571	3-18-65	

DOCUMENT NO.	DOCUMENT DESCRIPTION
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MISCELLANEOUS DOCUMENTS

MASTER

MASTER

BLOCK I, 0 SERIES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO.
CONTRACT
DRAWN R. Q. Jones DATE 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C.
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17226	RJ			
AH		REVISED PER TDRR -17571			3-16-65	

NOTES	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
							A							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G&N HARNESS HANDL & SHIPPING FIXT.
					A-23-082		A							1		1		71	1901663-021	TUBING ASSY, PLASTIC
					A-23-082		A							1	1			70	1901663-011	TUBING ASSY, PLASTIC
					A-23-114		A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198		A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
		1021034			A-23-169		A							1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-169		A							1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-168		A							2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-168		A							4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100		A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108		A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102		A							1	1	1		49	1900433-011 *	GSE -J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901933	A	PART OF 1901930										45	1901933-011	GSE PSA-J BOX
		1021035		1900005	C-23-411		A							1	1	1		44	1900145-011*	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G&N ASSY
		1021035		1900005	NA	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404		A							1	1	1		37	1900004-021*	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500		A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT P & M
					C-23-403	—	R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501	—	R					1		1				33	1020342	AGC CTS OPEPATION CONSOLE
					C-23-402	—	R					1		1	1			32	1020341	AGC TEST SET
					TBA		R					1		1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT, G & N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-190		R							1	1			27	1020001-3	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	—	R							1		1		4	1014061	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R&I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S. S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

MISCELLANEOUS DOCUMENTS

Ⓐⓖ THIS SHEET ADDED

BLOCK I
50 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN R. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Spading 3/9/65
APPROVED MIT M. Moorlay 3-9-65
APPROVED MSC A C Metz 3-9-65
DATE

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE D
DRAWING NO. 1900030
SCALE
SHEET 2 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			3-18-65	

NOTES	MISC	CMRM	N D	FTM	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					TBA		A						✓					81	TBA	CONNECTOR COVERS
					TBA		R						✓					80	TBA	CONNECTOR COVERS
					TBA		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
					TBA		K						✓					78	TBA	OUA PURGE VALVE COVERS
					TBA		K						✓				1	77	TBA	OPTICS CLEANING KIT
					TBA		K						✓				1	76	TBA	CONNECTOR COVERS
					TBA		K						✓				1	75	TBA	OPTICS COVERS
					TBA		K						✓					74	TBA	STAR & HORIZ SIMULATOR TEST EQUIP.
					TBA		K							1	1			73	TBA	STAR & HORIZ SIMULATOR
					H-23-185		A						✓	1	1		1	72	1901846-021	G & N HARNESS HANDL. & SHIPPING FIXTURE
					A-23-082		A							1		1		71	1901663-021	TUBING ASSY, PLASTIC
					A-23-082		A							1	1			70	1901663-011	TUBING ASSY PLASTIC
					A-23-114		A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101		A										1	68	1901492-021	AUXILIARY BATTERY PACK
					H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
					A-23-198		A							1	1	1		66	1901308-011*	GSE TO G&N INTERCONNECT CABLES
					A-23-167		A							1	1	1		65	1900931-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
					A-23-169		A							1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F.F.
					A-23-169		A							1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F.F.
					A-23-168		A							2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
					A-23-168		A							4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
					A-23-100		A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1900803-021	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
					A-23-099		A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
					A-23-101		A						✓	1	1	1		53	1902025-011	LOAD & SIGNAL SIMULATOR SET
					A-23-108		A							1	1	1		52	1900740-011*	GSE TO GSE INTERCONNECT CABLES
					A-23-090		A							1		1		51	1900606-021	PSA MTG FIXTURE
					A-23-107		A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
					A-23-102		A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
					A-23-197		A								1			48	1900364-061	BLANK PANEL ASSY
					S-23-100		A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
					A-23-103		A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106		A							1		1		45	1902195-011	GSE/PSA-J BOX
					C-23-411		A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
					A-23-093		A							1	1			43	1902204-011	G&N MTG FIXTURE
					A-23-092		A							1	1			42	1902303-011	OPTICS NAV BASE MTG FIXTURE
					A-23-091		A							1		1		41	1900012-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-011	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G&N, ASSY
					NA		A											38	1900005	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
					C-23-500		A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT, P&M
					C-23-403		R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33	1020342	AGC CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32	1020341	AGC TEST SET
					TBA		R							1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
					A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
					H-23-190		R							1	1			27	1020001	AGC HANDLING FIXTURE
					A-23-200		K							1	1		1	26	1019840	RETRO REFLECTING PRISM
					A-23-136		K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
					C-23-593		K							1	1			24	1019769	SHAFT ACCURACY TESTER
					A-23-109		K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
					A-23-199		K						✓	1	1			22	1019758	TOOLING BAR ASSY
					H-23-197		K						✓					21	1019721	CASE ASSY, STORAGE, MAP & DATA VIEWER
					H-23-186		K						✓					20	1019720	OPTICS—NAV BASE, SHIPPING CONTAINER
					H-23-199		K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
					A-23-079		K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
					A-23-097		K										1	17	1017383	G & N INSTALL. QUALIFICATION FIXTURE
					A-23-096		K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
					A-23-111		K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
					A-23-110		K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
					A-23-077		K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
					A-23-067		K							1	1			12	1016951	ALIGNMENT MIRROR ASSY.
					C-23-502		K				1							11	1016949	FUNCTIONAL TESTER ASSY.
					C-23-421		K				1							10	1016948	TESTER ASSY. MAP & DATA VIEWER
					A-23-095		K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-195		M							1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162		M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
					H-23-191		R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192		R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	1014061	R							1		1		4	1014061-011	COMP. SIMULATOR
					H-23-189		R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187		R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188		R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER
DOCUMENTS							QUANTITY REQUIRED											END ITEM		

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G&N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I

100 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED C. Sorley 3/4/65
APPROVED MIT M. J. Murley 3-9-65
APPROVED MSC R. C. 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE D
DRAWING NO. 1900030
SCALE
SHEET 3 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	P S	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	1021034			H-23-122	DWG				1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-082		A			1		1		1		1		67	1901663-021	TUBING ASSY. PLASTIC
				A-23-082		A			1	1			1	1			66	1901663-011	TUBING ASSY PLASTIC
				A-23-114		A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
	1021034			A-23-169		A			1		1		1		1		59	1900867-021	HOSE COOLANT INTERCONNET F-F
	1021034			A-23-169		A			1	1			1	1			58	1900867-011	HOSE COOLANT INTERCONNECT F-F
	1021034			A-23-168		A			2		2		2		2		57	1900866-021	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-168		A			4	4			4	4			56	1900866-011	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900264-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005-	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900100-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-130	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE., SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER. OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

PRE-BASELINE

2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM. A GSE COMPLEMENT OR THEIR COMPONENTS (✓).

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS 00995

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3 REVISED PER TDRR 17228 Cag 3/5/65	3/5/65	
AH	REVISED PER TDRR - 17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

BLOCK I, 0 SERIES

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

APPLICATION

NEXT ASSY	USED ON
	1000000

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO
CONTRACT

DRAWN R A Jones DATE 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 3

8 7 6 5 4 3 2 1

NOTICE WHEN GOVERNMENT DRAWINGS SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
DOCUMENTS							QUANTITY REQUIRED											END ITEM		
							A							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.
					A-23-082		A							1		1		71	1901663-021	TUBING ASSY PLASTIC
					A-23-082		A							1	1			70	1901663-011	TUBING ASSY PLASTIC
					A-23-114		A										1	69	1901520	CABLE, INTERCONNECT (NAA-F2 TO IMU)
					S-23-101	1901432-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-138		A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
		1021034			A-23-169		A							1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-169		A							1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-168		A							2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-168		A							4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100		A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108		A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102		A							1	1	1		49	1900433-011 *	GSE-J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901933	A	PART OF 1901930										45	1901333-011	GSE PSA-J BOX
		1021035		1900005	C-23-411		A							1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G&N ASSY
		1021035		1900005	NA	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404		A							1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500		A							1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT P & M
					C-23-403	——	R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501	——	R					1		1				33	1020342	AGC CTS OPERATION CONSOLE
					C-23-402	——	R					1		1	1			32	1020341	AGC TEST SET
					TBA		R					1		1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		——			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		——			H-23-190		R							1	1			27	1020001-3	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-193	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-036	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016943	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	——	R							1		1		4	1014061	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR-17571			3-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S.S)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I
50 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Sperling 3/9/65
APPROVED MIT 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. | SIZE D | DRAWING NO. 1900030
SCALE | SHEET 2 OF 3

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

NOTICE -- WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	MISC	CMRM	N D	F T M	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					TBA		A						✓					81	TBA	CONNECTOR COVERS
					TBA		R						✓					80	TBA	CONNECTOR COVERS
					TBA		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
					TBA		K						✓					78	TBA	OUA PURGE VALVE COVERS
					TBA		K						✓				1	77	TBA	OPTICS CLEANING KIT
					TBA		K						✓				1	76	TBA	CONNECTOR COVERS
					TBA		K						✓				1	75	TBA	OPTICS COVERS
					TBA		K						✓					74	TBA	STAR & HORIZ SIMULATOR TEST EQUIP.
					TBA		K							1	1			73	TBA	STAR & HORIZ SIMULATOR
					H-23-185		A						✓	1	1		1	72	1901846-021	G & N HARNESS HANDL. & SHIPPING FIXTURE.
					A-23-082		A							1		1		71	1901663-021	TUBING ASSY, PLASTIC
					A-23-082		A							1	1			70	1901663-011	TUBING ASSY. PLASTIC
					A-23-114		A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101		A										1	68	1901492-021	AUXILIARY BATTERY PACK
					H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
																		66		
					A-23-167		A							1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
					A-23-169		A							1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F.F.
					A-23-169		A							1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F.F.
					A-23-168		A							2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
					A-23-168		A							4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
					A-23-100		A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
					A-23-099		A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
					A-23-101		A						✓	1	1	1		53	1900797-021	LOAD & SIGNAL SIMULATOR SET
					A-23-108		A							1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
					A-23-090		A							1		1		51	1900606-021	PSA MTG FIXTURE
					A-23-107		A							1				50	1902046-011	REMOTE OPTICS CONTROLLER
					A-23-102		A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
					A-23-197		A								1			48	1900364-061	BLANK PANEL ASSY
					S-23-100		A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
					A-23-103		A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106		A							1		1		45	1902195-011	GSE/PSA-J BOX
					C-23-411		A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
					A-23-093		A							1	1			43	1902204-011	G&N MTG FIXTURE
					A-23-092		A							1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
					A-23-091		A							1		1		41	1900012-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-011	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G & N, ASSY
					NA		A											38	1902300-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
					C-23-500		A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT, P & M
					C-23-403		R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33	1020342	AGC CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32	1020341	AGC TEST SET
					TBA		R							1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
					A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
					H-23-190		R							1	1			27	1020001	AGC HANDLING FIXTURE
					A-23-200		K							1	1		1	26	1019840	RETRO REFLECTING PRISM
					A-23-196		K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
					C-23-593		K							1	1			24	1019769	SHAFT ACCURACY TESTER
					A-23-109		K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
					A-23-199		K						✓	1	1			22	1019758	TOOLING BAR ASSY
					H-23-197		K						✓					21	1019721	CASE ASSY, STORAGE, MAP & DATA VIEWER
					H-23-186		K						✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
					H-23-199		K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
					A-23-079		K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
					A-23-097		K										1	17	1017383	G & N INSTALL. QUALIFICATION FIXTURE
					A-23-096		K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
					A-23-111		K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
					A-23-110		K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
					A-23-077		K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
					A-23-067		K							1	1			12	1016951	ALIGNMENT MIRROR ASSY.
					C-23-502		K				1							11	1016949	FUNCTIONAL TESTER ASSY.
					C-23-421		K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
					A-23-095		K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198		M							1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162		M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
					H-23-191		R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192		R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11					C-23-401	1014061	R							1		1		4	1014061-000	COMP. SIMULATOR
					H-23-189		R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187		R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188		R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPOPT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11 P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR 17071			9-18-65	MM
AJ		REVISED PER TDRR 18580				W

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G & N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I
100 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED C. Searle 3/5/65
APPROVED MIT M. B. Hurley 3-9-65
APPROVED MSC R. C. Mc 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. | SIZE D | DRAWING NO. 1900030
SCALE | SHEET 3 OF 3

8 7 6 5 4 3 2 1

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MISC	CMRM	ND	FTM	MODEL NO.	P S	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	1021034			H-23-122	DWG				1	1	1	✓					71	1900009-021	G&N TRANSPORTATION CART
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-082		A			1		1		1		1		67	1901663-021	TUBING ASSY. PLASTIC
				A-23-082		A			1	1			1	1			66	1901663-011	TUBING ASSY. PLASTIC
				A-23-114		A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
	1021034			A-23-169		A			1		1		1		1		59	1900867-021	HOSE COOLANT INTERCONNET F-F
	1021034			A-23-169		A			1	1			1	1			58	1900867-011	HOSE COOLANT INTERCONNECT F-F
	1021034			A-23-168		A			2		2		2		2		57	1900866-021	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-168		A			4	4			4	4			56	1900866-011	HOSE COOLANT INTERCONNECT M-F
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB. TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

DOCUMENTS — QUANTITY REQUIRED — END ITEM

REVISIONS 00995			
SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-66	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3, REVISED PER TDRR 17228 Cal 2/5/65	2/9/65	
AH	REVISED PER TDRR-17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	
AK	REVISED PER TDRR 18999	5-10-65	

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

PRE-BASELINE

2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓).

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

DOCUMENT NO.	DOCUMENT DESCRIPTION
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MISCELLANEOUS DOCUMENTS

MASTER

MASTER

BLOCK I, O SERIES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R.Q. Jones DATE 1965 [illegible]
CHECKED 2/2/65
APPROVAL
APPROVAL C. [illegible]
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230 | SIZE D | NASA DRAWING NO. 1900030
SCALE — | WT | SHEET 1 OF 3

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	P S	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	1021034			H-23-122	DWG				1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
						A							1		1		67	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A							1	1			66	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-114		A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
																	59		
																	58		
																	57		
																	56		
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

PRE-BASELINE

2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓).

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS 00995

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981 RJ	2-2-66	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3 REVISED PER TDRR 17228 RJ Caf 3/9/65	3/9/65	
AH	REVISED PER TDRR-17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	
AK	REVISED PER TDRR 18999	5-10-65	
AL	REVISED PER TDRR 19719	5-17-65	

DOCUMENT NO.	DOCUMENT DESCRIPTION
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MISCELLANEOUS DOCUMENTS

MASTER

MASTER

BLOCK I, 0 SERIES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN R. A. Jones DATE 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C. [illegible] 2/2/65 RJ
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 5

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
							Δ							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G&N HARNESS HANDL & SHIPPING FIXT.
							A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G&N
					A-23-114		A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198		A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
																		63		
																		62		
																		61		
																		60		
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100		A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108		A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102		A							1	1	1		49	1900433-011 *	GSE -J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901933	A	PART OF 1901930										45	1901333-011	GSE PSA-J BOX
		1021035		1900005	C-23-411		A							1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G&N ASSY
		1021035		1900005	NA	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404		A							1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500		A							1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT P&M
					C-23-403	—	R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501	—	R					1		1				33	1020342	AGC CTS OPEPATION CONSOLE
					C-23-402	—	R					1		1	1			32	1020341	AGC TEST SET
					TBA		R					1		1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT. G&N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-190		R							1	1			27	1020001-3	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	—	R							1		1		4	1014061	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R&I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17226	RJ			
AH		REVISED PER TDRR -17571			3-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK
AK		REVISED PER TDRR 18999	F.P.G		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S.S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

(AG) THIS SHEET ADDED

BLOCK I
50 SERIES

MASTER

QTY RQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
	1000000
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Spading 3/9/65
APPROVED MIT M. Morley 3-9-65
APPROVED MSC R C Mc 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE
SHEET 2 OF 5

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

		DOCUMENTS					QUANTITY REQUIRED											END ITEM		
NOTES	MISC	MANUAL	N D	F T M	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
		ND 1021039			TBA		A						✓					81	TBA	CONNECTOR COVERS
		ND 1021039			TBA		R						✓					80	1020423	CONNECTOR COVERS
		ND 1021039			A-23-042		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND 1021039			H-23-206		K						✓					78	TBA	OUA PURGE VALVE COVERS
		ND 1021039			S-23-104		K						✓				1	77	1019984	OPTICS CLEANING KIT
		ND 1021039			TBA		K						✓				1	76	TBA	CONNECTOR COVERS
		ND 1021039			A-23-166		K						✓				1	75	TBA	OPTICS COVERS
		ND 1021040			A-23-203	1019970	K						✓					74	1019970	STAR — HORIZ SIMULATOR CERT. FIXTURE
		ND 1021040			A-23-202	1019977	K							1	1			73	1019977	STAR — HORIZ SIMULATOR
		ND 1021039			H-23-185	DWG	A						✓	1	1		1	72	1901646-021	~~G&N HARNESS HANDL. & SHIPPING FIXTURE~~
							A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G&N
		ND 1021039			A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND 1021039			S-23-101	1901492	A										1	68	1901492-021	AUXILIARY BATTERY PACK
		ND 1021039			H-23-193	DWG	A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
																		66		
		ND 1021040			A-23-167	1901981	A							1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND 1021040	1002065		A-23-080	ND	A							1		1		64	1900926-011	ROTARY TABLE ASSY
																		63		
																		62		
																		61		
																		60		
		ND 1021040			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND 1021040			A-23-100	*	A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND 1021040			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND 1021040			A-23-094	DWG	A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND 1021039			A-23-104	1900802	A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		ND 1021040			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND 1021040			A-23-101	1900797-021	A						✓	1	1	1		53	1900797-021	LOAD & SIGNAL SIMULATOR SET
		ND 1021040			A-23-108	DWG	A							1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND 1021040			A-23-090	DWG	A							1		1		51	1900606-021	PSA MTG FIXTURE
		ND 1021040			A-23-107	1902046	A							1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND 1021040			A-23-102	1901959	A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
		ND 1021040			A-23-197	DWG.	A								1			48	1900364-061	BLANK PANEL ASSY
		ND 1021039			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND 1021039			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND 1021040			A-23-106	1900268-031	A							1		1		45	1902195-011	GSE/PSA-J BOX
		ND 1021040			C-23-411	*	A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND 1021040			A-23-093	DWG	A							1	1			43	1902204-011	G&N MTG FIXTURE
		ND 1021040			A-23-092	DWG	A							1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND 1021040			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		ND 1021039			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND 1021039			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G&N, ASSY
		ND 1021040		190005-031	NA	1900005-031	A											38	1902300-011	OPTICS INERTIAL TEST SET
		ND 1021040			C-23-404	*	A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND 1021040			C-23-500	*	A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND 1021040			TBA	DWG	R							1				35	1020393	INTERCONNECT KIT, P&M
		ND 1021040		1020344	C-23-403	1014217	R					1		1	1	1		34	1020344	COMP CALIB SYS CONSOLE
		ND 1021040		1020342	C-23-501	1014465	R					1		1	1			33	1020342	AGC CTS OPERATION CONSOLE
		ND 1021040		1020341	C-23-402	1020341	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R							1				31	1020338	MOUNTING KIT
		ND 1021040			C-23-424	DWG	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G&N
		ND 1021040			C-23-423	DWG	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND 1021040			A-23-081	DWG	R							1	1			28	1020343	MAIN DSKY MTG STAND
		ND 1021039			H-23-190	DWG	R							1	1			27	1020001-002	AGC HANDLING FIXTURE
		ND 1021039			A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND 1021039			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND 1021040			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		ND 1021040			A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND 1021040			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		ND 1021039			H-23-197	1019721	K						✓					21	1019721	CASE ASSY, STORAGE, MAP & DATA VIEWER
		ND 1021039			H-23-186	1019720	K						✓					20	1019720	OPTICS—NAV BASE, SHIPPING CONTAINER
		ND 1021039			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND 1021040			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND 1021039			A-23-097	1017383	K										1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
		ND 1021039			A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND 1021040			A-23-111	1017381	K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-110	1017380	K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-077	1017376	K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND 1021040			A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY.
		ND 1021040			C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY.
		ND 1021040			C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		ND 1021040			A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
		ND 1021040			H-23-198	DWG	M							1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND 1021039			A-23-162	DWG	M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND 1021039			H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND 1021039			H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11		ND 1021040		1014061	C-23-401	1014061	R							1		1		4	1014061-000	COMP SIMULATOR
		ND 1021039			H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND 1021039			H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
		ND 1021039			H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPOPT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11. P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			3-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.			WK
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND1021041	G&N SYSTEM MANUAL	
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G&N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER FROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I
100 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED
APPROVED MIT 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE
SHEET 3 OF 5

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	WK

NOTES	MISC	CMRM	N D	F T M	MODEL NO.	P S	P C				371	361	351	341	331	321	311	ITEM NO.	PART NO. IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
SEE NOTE 11							R							1	1	1		86		AUX CALIB SYS CONSOLE
							A							1	1	1		85		PTA/PCA MOUNTING FIXTURE
					S-23-105	2900063	A						✓				1	84	2900063-011	LIFTING TEMP CONTROLLER
MECH DWG 1022868							K						✓				1	83	1022896	CONNECTOR COVERS (OPTICS)
							R						✓				1	82		CONNECTOR COVERS (AGC)
							A						✓				1	81	1902430	CONNECTOR COVERS (ISS)
MECH DWG 1019899						1019926	K					1						80	1019926	GEN FIXTURE STAND
							A											79		PSA-CDU-AGC MTG FIXTURE
					H-23-206		K						✓					78		DUA PURGE VALVE COVERS
MECH DWG 1022864 & 1022870					S-23-104		K						✓				1	77	1019984	OPTICS CLEANING KIT
							K											76		
MECH DWG 1022865							K						✓				1	75	1022880	OPTICS COVERS
MECH DWG 1019883					A-23-166		K							1	1			74	1019970	STAR – HORIZ SIMULATOR CERT FIXTURE
MECH DWG 1019900					A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
					H-23-185		A						✓	1	1		1	72		G&N HARNESS HANDL. & SHIPPING FIXTURE
																		71		
																		70		
					A-23-114		A										1	69		CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101		A										1	68		AUXILIARY BATTERY PACK
					H-23-193		A						✓	1	1		1	67		
																		66		
					A-23-167		A							1	1	1		65	*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
							A											63		
							A											62		
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G&N
					A-23-98		A						✓	1		1		59		ROTARY TABLE CALIB. SET
																		58		
					A-23-105		A						✓	1	1	1		57		IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56		FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55		IMU SNAP-ON BELLOWS
							A											54		
					A-23-101	2900062	A						✓	1	1	1		53	2900062-011	LOAD & SIGNAL SIMULATOR SET
							A							1	1	1		52	*	CABLE KIT, INTERCONNECT
					A-23-090		A							1		1		51		
					A-23-107		A							1				50		REMOTE OPTICS CONTROLLER
					A-23-102	2900024	A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
					A-23-197		A								1			48	1900364-064*	BLANK PANEL ASSY.
					S-23-100		A						✓	1	1	1	1	47		INERTIAL COMP. TEMP. CONTROLLER
					A-23-103	2010602	A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY.
																		45		
					C-23-411		A							1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE
					A-23-093		A							1	1			43		G&N MTG FIXTURE
					A-23-092		A							1	1			42		OPTICS MTG FIXTURE
					A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE
					H-23-123		A						✓					40		IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39		TRANSPORTATION CART, G&N, ASSY.
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	*	OPTICS INERTIAL ANALYZER
1900000-011 USABLE					C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
							R							1				35		INTERCONNECT KIT, P&M
SEE NOTE 11					C-23-403		R					1	✓					34		COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33		AGC CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32		AGC TEST SET
																		31		
					C-23-424		R					1		1	1			30		AGC GSE INTERCONNECT KIT G&N
					C-23-423		R					1		1				29		AGC GSE INTERCONNECT KIT SUB-SYS.
					A-23-081		R							1	1			28		DSKY MTG STAND
					H-23-190		R						✓	1	1			27		AGC HANDLING FIXTURE
					A-23-200		K							1	1		1	26	1019840	RETRO REFLECTING PRISM
					A-23-196		K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
					C-23-593		K							1	1			24	1019769	SHAFT ACCURACY TESTER
					A-23-109		K							1	1			23		ADJ. MIRROR & PEDESTAL ASSY
					A-23-199		K						✓	1	1			22		TOOLING BAR ASSY.
							K				1							21		AUX PTF
MECH. DWG 1022903					H-23-186		K						✓					20		OPTICS-NAV BASE SHIPPING CONTAINER
					H-23-199		K						✓					19		SHIPPING & STORAGE CONTAINER, OPT UNIT
					A-23-079		K						✓	1	1		1	18		THEODOLITE & SUPPORT ASSY.
					A-23-097		K										1	17		G&N INSTALL. QUALIFICATION FIXTURE
MECH DWG 1022866 & 1022902					A-23-096		K										1	16		AZIMUTH REFERENCE FIXTURE
					A-23-111		K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY.
					A-23-110		K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY.
					A-23-077		K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
					A-23-067		K							1	1			12	1016951	ALIGNMENT MIRROR ASSY.
MECH DWG 1019890					C-23-502	2010605	K				1							11	1016949-001	FUNCTIONAL TESTER ASSY.
																		10		
					A-23-095		K				1							9	1016910-001	PRECISION TEST FIXTURE
					H-23-198		M							1	1	1		8		IMU LIFTING FIXTURE
					A-23-162		M										1	7		JUMPER BY-PASS ASSY, COOLANT FL.
																		6		
					H-23-192		R					1		1				5		AGC UNIV DSKY HANDLING FIXTURE
					C-23-401		R							1		1		4		COMP. SIMULATOR
																		3		
					H-23-187		R						✓					2		AGC SHIPPING CONTAINER
					H-23-188		R						✓					1		AGC UNIV DSKY SHIPPING CONTAINER
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		

NOTES

1. 311 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 321 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 331 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 341 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).
5. 351 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 361 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
7. 371 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.
11. CALIB. SYS CONSOLE CAN BE USED IN LIEU OF AUX. CALIB. SYS CONSOLE.

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900204	MECH. DIAG., TEMP MONITOR & CONTROL	FOR I/100 TESTING ONLY
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	
2900203	MECH. DIAG., TEMP MONITOR & CONTROL PANEL	
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	
2900219	MECH. DIAG., COUNTER SIGNAL COLLECTION	
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	
2900215	MECH. DIAG., MEASUREMENTS REF. POWER SUPPLIES	
2900212	MECH. DIAG., PIP & IRIG MONITORING	
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	
2900205	MECH. DIAG., PORT TEMP CONTROLLER	
2900207	MECH. DIAG., MONITOR PANEL	
2900201	MECH. DIAG., TEST CONTROL PANEL	
2900200	MECH. DIAG., GYRO CAGING PANEL	
2314021	MECH. DIAG., AGC SIMULATOR	
MISCELLANEOUS DOCUMENTS		

THIS SHEET ADDED

BLOCK II

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
1000000	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

		DATE
DRAWN	R. A. Jones	3-19-65
CHECKED		5/18/65
APPROVED		
APPROVED	C. Sparling	5/18/65
APPROVED MIT	W Kupfer	2 Jun 65
APPROVED MSC	A. C.	6/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.	SIZE	DRAWING NO.
	D	1900030

SCALE —
SHEET 4 OF 5

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	FPG		5-17-65	WK

DOCUMENTS							QUANTITY REQUIRED											END ITEM		
NOTES	MISC	MANUAL	ND	FTM	MODEL NO.	PS	PC				471	461	451	441	431	421	411	ITEM NO	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
							A							1	1	1		85		PTA/PCA MTG FIXTURE
							R							1	1	1		84		AGC AUX CALIB. SYS. CONSOLE
							K				1		✓	1	1		1	83		CONNECTOR COVERS, OPTICS
							A							1	1	1		82		CABLE BREAK-OUT BOXES
					S-23-105		A										1	81		LIFTING TEMP. CONTROLLER
							A							1	1	1		80		PSA-CDU-AGC MTG FIXTURE
MECH. DWG G014001							K				1							79	6014003	AOT TESTER
					H-23-205		K						✓					78		AOT PURGE VALVE COVERS
					S-23-104		K						✓				1	77	1019984	OPTICS CLEANING KIT
							A						✓	1	1	1	1	76		CONNECTOR COVERS
					A-23-112		K						✓				1	75		OPTICS COVER, AOT
							R					1	✓	1	1		1	74		CONNECTOR COVERS, LGC SUBSYS.
																		73		
																		72		
																		71		
																		70		
					A-23-114		A										1	69		CABLE, INTERCONNECT
					S-23-101		A										1	68		AUXILIARY BATTERY PACK
																		67		
																		66		
					A-23-167		A							1	1	1		65	*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-98		A						✓	1		1		59		ROTARY TABLE CALIB. SET
																		58		
					A-23-105		A						✓	1	1	1		57		IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56		FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55		IMU SNAP-ON BELLOWS
																		54		
					A-23-101		A						✓	1	1	1		53		LOAD & SIGNAL SIMULATOR SET
					A-23-108		A							1	1	1		52	*	CABLE KIT, INTERCONNECT
																		51		
																		50		
					A-23-102		A							1	1	1		49	*	GUIDANCE DIST. BOX
					A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY
					S-23-100		A						✓	1	1	1	1	47		INERTIAL COMP TEMP CONTROLLER
					A-23-103		A						✓	1	1	1	1	46		DEGAUSSER ASSY
																		45		
					C-23-411		A							1	1	1		44	1902134-021*	G & N COOLANT & POWER CONSOLE
																		43		
																		42		
					A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE
					H-23-123		A						✓					40		IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39		TRANSPORTATION CART G & N ASSY
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	*	OPTICS INERTIAL ANALYSER
					C-23-500		A							1	1	1		36	*	OSCILLOGRAPH CONSOLE
							R							1				35		INTERCONNECT KIT, P & M
					C-23-403		R					1		1	1	1		34		COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33		AGC CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32		AGC TEST SET
																		31		
					C-23-424		R					1		1	1			30		AGC GSE INTERCONNECT KIT G & N
					C-23-423		R					1		1				29		AGC GSE INTERCONNECT KIT SUB-SYS
																		28		
					H-23-190		R						✓					27		AGC HANDLING FIXTURE
																		26		
																		25		
																		24		
																		23		
																		22		
																		21		
							K						✓					20		NAV BASE SHIPPING CONTAINER
MECH. DWG G014002							K						✓					19	6014000	LEM AOT SHIPPING CONTAINER
							K						✓					18		THEODOLITE & SUPPORT ASSY
																		17		
																		16		
																		15		
																		14		
																		13		
																		12		
																		11		
																		10		
																		9		
					H-23-198		M							1	1	1		8		IMU LIFTING FIXTURE
					A-23-162		M										1	7		JUMPER BY-PASS ASSY COOLANT FL.
																		6		
					H-23-192		R					1		1				5		AGC UNIV DSKY HANDLING FIXTURE
					C-23-401		R							1		1		4		COMP SIMULATOR
																		3		
					H-23-187		R						✓					2		AGC SHIPPING CONTAINER
					H-23-188		R						✓					1		AGC UNIV DSKY SHIPPING CONTAINER

NOTES:

1. 411 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING
2. 421 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING
3. 431 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING
4. 441 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N)
5. 451 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 461 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS TESTING)
7. 471 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

MISCELLANEOUS DOCUMENTS	
DOCUMENT NO.	DOCUMENT DESCRIPTION
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM
2900211	MECH. DIAG., AUX. INPUT-OUTPUT
2900203	MECH. DIAG., TEMP MONITOR & CONTROL
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL
2900219	MECH. DIAG., COUNTER SIGNAL SELECTION
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT
2900215	MECH. DIAG., MEASUREMENT REF. POWER SUPPLIES
2900212	MECH. DIAG., PIP & IRIG MONITORING
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL
2900207	MECH. DIAG., MONITOR PANEL
2900205	MECH. DIAG., PORTABLE TEMP CONTROLLER
2900201	MECH. DIAG., TEST CONTROL PANEL
2900200	MECH. DIAG., GYRO CAGING PANEL

THIS SHEET ADDED

LEM

LIST OF MATERIALS				
QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

APPLICATION	
NEXT ASSY	USED ON
1000000	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN F P [illegible] 5-13-65
CHECKED [illegible] 5/18/65
APPROVED
APPROVED C Sparling 5/18/65
APPROVED MIT W Kupfer 2 June 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 5 OF 5

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS 00995			
SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3 REVISED PER TDRR 17228 Cal 3/9/65	4/9/65	
AH	REVISED PER TDRR -17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	
AK	REVISED PER TDRR 18999	5-10-65	
AL	REVISED PER TDRR 19719	5-17-65	
AM	REVISED PER TDRR 21939	8-18-65	MGM

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓).
6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

PRE-BASELINE (notes 2–4)

POST-BASELINE (notes 6–8)

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	PS	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
						M						✓				1	73	1021640	LIFTING SLING G & N INST QUAL FIXT/AZ REF. FIXT.
						A										1	72	1902431-011	PSA ADAPTER MODULE (CARRY ON)
	1021034			H-23-122	DWG	A			1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404		A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
						A							1		1		67	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A							1	1			66	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-114		A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
																	59		
																	58		
																	57		
																	56		
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011/021	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005-011	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC/CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

DOCUMENT NO.	DOCUMENT DESCRIPTION
2900224	PSA ADAPTER MODULE MECH. DIAG. (CARRY ON)
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MISCELLANEOUS DOCUMENTS

MASTER

BLOCK I, 0 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO.
CONTRACT

DRAWN R. A. Jones DATE JAN 27 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C. Dunlop
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 7

NOTICE WHEN GOVERNMENT DRAWINGS SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
							M						✓				1	75	1021640	LIFTING FIXT. G & N INST. QUAL. FIXT./AZ REF. FIXT
							A										1	74	1902431-011	PSA ADAPTER MODULE (CARRY ON)
							A							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.
							A							1		1		71	1901875-011	HOSE SET GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-114		A										1	69	1901520	CABLE INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198		A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
						DWG	K							1	1	1		63	1022934	CABLE W17
																		62		
																		61		
																		60		
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100		A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108		A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102		A							1	1	1		49	1900433-011 *	GSE -J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901933	A	PART OF 1901930										45	1901333-011	GSE PSA-J BOX
		1021035		1900005	C-23-411		A							1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G & N ASSY
		1021035		1900005	NA	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404		A							1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500		A							1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT P & M
					C-23-403	—	R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501	—	R					1		1				33	1020342	AGC/CTS OPEPATION CONSOLE
					C-23-402	—	R					1		1	1			32	1020341	AGC TEST SET
					TBA		R					1		1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-190		R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-193	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	—	R							1		1		4	1014061	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
AG		THIS SHEET ADDED. TDRR 17228	RJ				
AH		REVISED PER TDRR -17571			3-16-65	WJM	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK	
AK		REVISED PER TDRR 18999	F.P.G		5-0-65	WJM	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK	
AM		REVISED PER TDRR 21939	F.P.G.		8-13-65	WJM	

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900224	MECH. DWG, PSA ADAPTER MODULE (CARRY ON)	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S. S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

(AG) THIS SHEET ADDED

BLOCK I
50 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. a. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Spraling 3/9/65
APPROVED MIT M.J. Monley 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 2 OF 7

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NOTES	MISC	MANUAL	ND	FTM	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
		ND1021039			TBA		A						✓					81	1902430-011	COVER SET, ELECTRICAL CONN.
		ND1021039			TBA		R						✓					80	1020423	CONNECTOR COVERS (AGC)
		ND1021039			A-23-042		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND1021039			H-23-206		K						✓					78	TBA	OUA PURGE VALVE COVERS
		ND1021039			S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
		ND1021039			TBA		K						✓				1	76	TBA	CONNECTOR COVERS (OPTICS)
		ND1021039			A-23-166		K						✓				1	75	TBA	OPTICS COVERS
		ND1021040			A-23-203	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR CERT. FIXTURE
		ND1021040			A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
		ND1021039			H-23-185	DWG	A						✓	1	1		1	72	1901846-021	G & N HARNESS HANDL. & SHIPPING FIXTURE
							A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			70	1901876-011	HOSE SET GSE COOLANT INTERCONN, G & N
		ND1021039			A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND1021039			S-23-101	1901492	A										1	68	1901492-021	AUXILIARY BATTERY PACK
		ND1021039			H-23-193	DWG	A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
							A										1	66	TBA	PSA ADAPTER MODULE (CARRY ON)
		ND1021040			A-23-167	1901981	A							1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND1021040	1002065		A-23-080	ND	A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
																		61		
							M						✓				1	60	1021640	LIFTING FIXT., G&N INST. QUAL. FIXT./AZ REF. FIXT.
		ND1021040			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND1021040			A-23-100	*	A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND1021040			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND1021040			A-23-094	DWG	A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND1021039			A-23-104	1900802	A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		ND1021040			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND1021040			A-23-101	1900797-021	A						✓	1	1	1		53	1900797-021/031	LOAD & SIGNAL SIMULATOR SET
		ND1021040			A-23-108	DWG	A							1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND1021040			A-23-090	DWG	A							1		1		51	1900606-021	PSA MTG FIXTURE
		ND1021040			A-23-107	1902046	A							1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND1021040			A-23-102	1901959	A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
		ND1021040			A-23-197	DWG.	A								1			48	1900364-061	BLANK PANEL ASSY
		ND1021039			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND1021039			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND1021040			A-23-106	1900268-031	A							1		1		45	1902195-011	GSE/PSA-J BOX
		ND1021040			C-23-411	*	A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND1021040			A-23-093	DWG	A							1	1			43	1902204-011	G&N MTG FIXTURE
		ND1021040			A-23-092	DWG	A							1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND1021040			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		ND1021039			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND1021039			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G&N, ASSY
		ND1021040		190005-031	NA	1900005-031	A											38	1902300-011	OPTICS INERTIAL TEST SET
		ND1021040			C-23-404	*	A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND1021040			C-23-500	*	A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND1021040			TBA	DWG	R							1				35	1020393	INTERCONNECT KIT, P&M
		ND1021040		1020344	C-23-403	1014217	R					1		1	1	1		34	1020344	COMP CALIB SYS CONSOLE
		ND1021040		1020342	C-23-501	1014465	R					1		1				33	1020342	AGC/CTS OPERATION CONSOLE
		ND1021040		1020341	C-23-402	1020341	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R							1				31	1020338	MOUNTING KIT
		ND1021040			C-23-424	DWG	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
		ND1021040			C-23-423	DWG	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND1021040			A-23-081	DWG	R							1	1			28	1020343	MAIN DSKY MTG STAND
		ND1021039			H-23-190	DWG	R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		ND1021039			A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND1021039			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND1021040			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		ND1021040			A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND1021040			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		ND1021039			H-23-197	1019721	K						✓					21	1019721	CASE ASSY, STORAGE, MAP & DATA VIEWER
		ND1021039			H-23-186	1019720	K						✓					20	1019720	OPTICS–NAV BASE, SHIPPING CONTAINER
		ND1021039			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND1021040			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND1021039			A-23-097	1017383	K										1	17	1017383	G & N INSTALL. QUALIFICATION FIXTURE
		ND1021039			A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND1021040			A-23-111	1017381	K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-110	1017380	K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-077	1017376	K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND1021040			A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY.
		ND1021040			C-23-502	2010605	K				1							11	1016949-011	FUNCTIONAL TESTER ASSY.
		ND1021040			C-23-421	1016948	K				1							10	1016948	TESTER ASSY MAP & DATA VIEWER
		ND1021040			A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE
		ND1021040			H-23-198	DWG	M							1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND1021039			A-23-162	DWG	M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND1021039			H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND1021039			H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11		ND1021040		014061	C-23-401	1014061	R							1		1		4	1014061-011	COMP. SIMULATOR
		ND1021039			H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND1021039			H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
		ND1021039			H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPOPT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11 P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
AG		THIS SHEET ADDED. TDRR 17228	RJ				
AH		REVISED PER TDRR 17571			3-16-65		
AJ		REVISED PER TDRR 18580	F.P.G.			WK	
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65		
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65		

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1022866	DIAG. MECH. AZIMUTH REF. FIXTURE	
2900221	DIAG. MECH. PSA ADAPTER MODULE (CARRY ON)	
ND1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND1021041	G&N SYSTEM MANUAL	
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G & N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I
100 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED C. Sperling 3/5/65
APPROVED MIT M. J. Murley 3-9-65
APPROVED MSC R. C. 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 3 OF 7

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REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	WK
AN		REVISED PER TDRR 21939	F.P.G.		8-18-65	

NOTES

1. 311 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 321 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 331 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 341 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).
5. 351 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 361 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
7. 371 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.
11. CALIB. SYS CONSOLE CAN BE USED IN LIEU OF AUX. CALIB. SYS CONSOLE.

NOTES	MISC	CMRM	N D	MODEL NO.	P S	P C	371	361	351	341	331	321	311	ITEM NO.	PART NO. IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	DOCUMENTS						QUANTITY REQUIRED							END ITEM		
						A								87		CABLE BREAK-OUT BOXES
SEE NOTE 11					TBA	R				1	1	1		86		AUX CALIB SYS CONSOLE
						A				1	1	1		85	2900066-011	PTA/PEA MOUNTING FIXTURE
				S-23-105	2900063	A			✓				1	84	2900063-011	LIFTING TEMP CONTROLLER
MECH DWG 1022868						K			✓				1	83	1022896	CONNECTOR COVERS (OPTICS)
					DWG	R			✓				1	82		CONNECTOR COVERS (AGC)
						A			✓				1	81	2900065-011	CONNECTOR COVERS (ISS)
MECH DWG 1019899					1019926	K		1						80	1019926	G&N FIXTURE STAND
														79		
				H-23-206		K			✓					78		DUA PURGE VALVE COVERS
MECH DWG 1022864	& 1022870			S-23-104		K			✓				1	77	1019984-011	OPTICS CLEANING KIT
						K	1							76	1022942	PTF CALIBRATION KIT
MECH DWG 1022865						K			✓				1	75	1022880	OPTICS COVERS
MECH DWG 1019883				A-23-166	1019970	K				1	1			74	1019970	STAR – HORIZ SIMULATOR CERT FIXTURE
MECH DWG 1019900				A-23-202	1019977	K				1	1			73	1019977	STAR – HORIZ SIMULATOR
				H 23 185		A			✓	1	1		1	72	2900069-011	G&N HARNESS HANDL. & SHIPPING FIXTURE
														71		
														70		
				A-23-114		A							1	69		CABLE INTERCONNECT (NAA-P2 TO IMU)
														68		
														67		
														66		
				A-23-167		A				1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
				A-23-080		A				1		1		64	1900926-021	ROTARY TABLE ASSY
														63		
														62		
						A				1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A				1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-98		A			✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET
														58		
				A-23-105		A			✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
				A-23-094		A			✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
				A-23-104		A			✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
						A								54		
														53		
						A				1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
						A				1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
				A-23-107		A				1				50	1902046-021	REMOTE OPTICS CONTROLLER
				A-23-102	2900024	A				1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
				A-23-197		A					1			48	1900364-061 *	BLANK PANEL ASSY.
				S-23-100		A			✓	1	1	1	1	47	2900060-011	INERTIAL COMP. TEMP. CONTROLLER
				A-23-103	2010602	A			✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY.
						M			✓				1	45	1021640	LIFTING SLING, G&N INST. QUAL. FIXT./AZ REF FIXT.
				C-23-411		A				1	1	1		44	1902134-021 *	G&N COOLANT & POWER CONSOLE
				A-23-093		A				1	1			43	2900067-011	G&N MTG FIXTURE
				A-23-092		A				1	1			42	2900072-011	OPTICS MTG FIXTURE
				A-23-091		A				1		1		41	2900000-011	IMU MTG FIXTURE
				H-23-123		A			✓					40	1900010-021	IMU SHIPPING CONTAINER
				H-23-122		A			✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G&N, ASSY.
				NA		A								38	2900022-011	OPTICS INERTIAL TEST SET
				C-23-404		A				1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYZER
1900000-011 USABLE				C-23-500		A				1	1	1		36	1900000-021 *	OSCILLOGRAPH CONSOLE
					DWG	R				1				35		INTERCONNECT KIT, P&M
SEE NOTE 11				C-23-403	TBA	R		1	✓					34	1020344	COMP CALIB SYS CONSOLE
				C-23-501	TBA	R		1		1				33	2014044	AGC/CTS OPERATION CONSOLE
				C-23-402	TBA	R		1		1	1			32	2014042	AGC TEST SET
														31		
				C-23-424	TBA	R		1		1	1			30		AGC GSE INTERCONNECT KIT G&N
				C-23-423	DWG	R		1		1				29		AGC GSE INTERCONNECT KIT SUB-SYS.
				A-23-081		R				1	1			28		DSKY MTG STAND
				H-23-190	DWG	R			✓	1	1			27	2014282-011	AGC HANDLING FIXTURE
				A-23-200		K				1	1		1	26	1019840	RETRO REFLECTING PRISM
				A-23-196		K	1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
				C-23-593		K				1	1			24	1019769	SHAFT ACCURACY TESTER
				A-23-109		K				1	1			23		ADJ. MIRROR & PEDESTAL ASSY
				A-23-199		K			✓	1	1			22	1019758	TOOLING BAR ASSY.
					1019962	K	1							21	1019962	AUX PTF STAND
						A			✓					20	2900068-011	NAV BASE SHIPPING CONTAINER
MECH. DWG 1022903				H-23-199		K			✓					19		SHIPPING & STORAGE CONTAINER, OPT UNIT
				A-23-079		K			✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
				A-23-097		K							1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
MECH DWG 1022866	& 1022902			A-23-096		K							1	16		AZIMUTH REFERENCE FIXTURE
				A-23-111		K				1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY.
				A-23-110		K				2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY.
				A-23-077		K				1	1			13	1017376	WEDGE, VARIABLE DEVIATION
				A-23-067		K				1	1			12	1016951	ALIGNMENT MIRROR ASSY.
MECH DWG 1019890				C-23-502	2010605	K	1							11	1016949-011	FUNCTIONAL TESTER ASSY.
														10		
				A-23-095	2010606	K	1							9	1016910-011	PRECISION TEST FIXTURE
				H-23-198		A				1	1	1		8	2900064-011	IMU LIFTING FIXTURE
				A-23-162		A							1	7		JUMPER BY-PASS ASSY, COOLANT FL.
														6		
				H-23-192	DWG	R		1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
				C-23-401	TBA	R				1		1		4	2014048	COMP. SIMULATOR
														3		
				H-23-187	SCD	R			✓					2	1006421	AGC SHIPPING CONTAINER
				H-23-188	SCD	R			✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	II, LEM
2900225	MECH. DIAG., TEST POINT ADAPTER	II, LEM
2014022	MECH. DIAG., AGC TEST SET	I, II, LEM
2014021	MECH. DIAG., AGC SIMULATOR	I, II, LEM
2014020	MECH. DIAG., AGC/CTS OPER. CONSOLE	I, II, LEM
2014019	MECH. DIAG., AUX. CALIB. SYS. CONSOLE	I, II, LEM
2014018	MECH. DIAG., AGC. CALIB. SYS. CONSOLE	I, II, LEM
2900224	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/0, I/50
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	I/100, II, LEM
2900221	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/100
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	II, LEM
2900216	MECH. DIAG., OPTICS CONTROL	I/100, II, LEM
2900214	MECH. DIAG., GROUNDING	I/100, II
2900213	MECH. DIAG., GROUNDING	II, LEM
2900210	MECH. DIAG., AC POWER PROTECTION & POWER DIST.	I/100, II, LEM
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	I/100, II, LEM
2900206	MECH. DIAG., TEST SELECTOR	I/100, II, LEM
2900202	MECH. DIAG., TEST CONTROL	I/100, II
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900204	MECH. DIAG., TEMP MONITOR & CONTROL	FOR I/100 TESTING ONLY
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	I/100, II, LEM
2900203	MECH. DIAG., TEMP MONITOR & CONTROL PANEL	II, LEM
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	I/100, II, LEM
2900219	MECH. DIAG., COUNTER SIGNAL COLLECTION	I/100, II, LEM
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	I/100, II, LEM
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	I/100, II, LEM
2900215	MECH. DIAG., MEASUREMENTS REF. POWER SUPPLIES	I/100, II, LEM
2900212	MECH. DIAG., PIP & IRIG MONITORING	I/100, II, LEM
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	I/100, II, LEM
2900205	MECH. DIAG., PORT TEMP CONTROLLER	I/100, II, LEM
2900207	MECH. DIAG., MONITOR PANEL	I/100, II, LEM
2900201	MECH. DIAG., TEST CONTROL PANEL	II, LEM
2900200	MECH. DIAG., GYRO CAGING PANEL	I/100, II, LEM
2014021	MECH. DIAG., AGC SIMULATOR	

THIS SHEET ADDED

BLOCK II

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN R. A. Jones 3-19-65
CHECKED 5/18/65
APPROVED
APPROVED C. Spalding 5/18/65
APPROVED MIT W. Kupfer 2 June 65
APPROVED MSC 6/2/65
DATE

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 4 OF 7

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	

NOTES:

1. 411 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING
2. 421 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING
3. 431 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING
4. 441 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N)
5. 451 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 461 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS TESTING)
7. 471 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

	DOCUMENTS					QUANTITY REQUIRED								END ITEM		
NOTES	MISC	MANUAL	ND	MODEL NO.	PS	PC	471	461	451	441	431	421	411	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
						A				1	1	1		85	2900066-011	PTA/PEA MTG FIXTURE
						R				1	1	1		84		AGC AUX CALIB. SYS. CONSOLE
						K	1		✓	1	1		1	83		CONNECTOR COVERS, OPTICS
						A				1	1	1		82		CABLE BREAK-OUT BOXES
				S-23-105		A							1	81	2900063-011	LIFTING TEMP. CONTROLLER
														80		
MECH. DWG G014001						K	1							79	G014003	AOT TESTER
				H-23-205		K			✓					78		AOT PURGE VALVE COVERS
				S-23-104		K			✓				1	77	1019984-011	OPTICS CLEANING KIT
						A			✓	1	1	1	1	76	6900001-011	CONNECTOR COVERS
				A-23-112		K			✓				1	75		OPTICS COVER, AOT
						R		1	✓	1	1		1	74		CONNECTOR COVERS, LGC SUBSYS.
														73		
														72		
														71		
														70		
				A-23-114		A							1	69		CABLE, INTERCONNECT
														68		
														67		
														66		
				A-23-167		A				1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
				A-23-080		A				1		1		64	1900926-021	ROTARY TABLE ASSY
														63		
														62		
						A				1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A				1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-98		A			✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET
														58		
				A-23-105		A			✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
				A-23-094		A			✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
				A-23-104		A			✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
														54		
														53		
				A-23-108		A				1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
						A				1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
														50		
				A-23-102		A				1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
				A-23-197		A					1			48	1900364-061*	BLANK PANEL ASSY
				S-23-100		A			✓	1	1	1	1	47	2900060-011	INERTIAL COMP TEMP CONTROLLER
				A-23-103		A			✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY
														45		
				C-23-411		A				1	1	1		44	1902134-021*	G & N COOLANT & POWER CONSOLE
														43		
						A					1	1		42	6900003-011	IMU/NAV BASE MTG FIXTURE
				A-23-091		A				1		1		41	2900000-011	IMU MTG FIXTURE
				H-23-123		A			✓					40	1900010-021	IMU SHIPPING CONTAINER
				H-23-122		A			✓	1	1	1		39	1900009-031	TRANSPORTATION CART G & N ASSY
				NA		A								38	2900022-011	OPTICS INERTIAL TEST SET
				C-23-404		A				1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYSER
				C-23-500		A				1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
						R				1				35		INTERCONNECT KIT, P & M
				C-23-403		R		1		1	1	1		34	1020344	COMP CALIB SYS CONSOLE
				C-23-501		R		1		1				33	2014044	AGC/CTS OPERATION CONSOLE
				C-23-402		R		1		1	1			32	2014042	AGC TEST SET
														31		
				C-23-424		R		1		1	1			30		AGC GSE INTERCONNECT KIT G & N
				C-23-423		R		1		1				29		AGC GSE INTERCONNECT KIT SUB-SYS
														28		
				H-23-190		R			✓					27	2014282-011	AGC HANDLING FIXTURE
														26		
														25		
														24		
														23		
														22		
														21		
														20		
MECH. DWG G014002						K			✓					19	G014000	LEM AOT SHIPPING CONTAINER
						K			✓					18	1017447	THEODOLITE & SUPPORT ASSY
														17		
														16		
														15		
														14		
														13		
														12		
														11		
														10		
														9		
				H-23-198		A				1	1	1		8	2900064-011	IMU LIFTING FIXTURE
				A-23-162		A							1	7		JUMPER BY-PASS ASSY COOLANT FL.
														6		
				H-23-192		R		1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
				C-23-401		R				1		1		4		COMP SIMULATOR
														3		
				H-23-187		R			✓					2	1006421	AGC SHIPPING CONTAINER
				H-23-188		R			✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	
2900225	MECH. DIAG., TEST POINT ADAPTER	
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	
2900216	MECH. DIAG., OPTICS CONTROL	
2900213	MECH. DIAG., GROUNDING	
2900210	MECH. DIAG., AC POWER PROTECTION & POW. DIST.	
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	
2900206	MECH. DIAG., TEST SELECTOR	
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	
2900203	MECH. DIAG., TEMP MONITOR & CONTROL	
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	
2900219	MECH. DIAG., COUNTER SIGNAL SELECTION	
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	
2900215	MECH. DIAG., MEASUREMENT REF. POWER SUPPLIES	
2900212	MECH. DIAG., PIP & IRIG MONITORING	
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	
2900207	MECH. DIAG., MONITOR PANEL	
2900205	MECH. DIAG., PORTABLE TEMP CONTROLLER	
2900201	MECH. DIAG., TEST CONTROL PANEL	
2900200	MECH. DIAG., GYRO CAGING PANEL	

THIS SHEET ADDED

LEM

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN F. P. G. 5-13-65
CHECKED 5/18/65
APPROVED
APPROVED 5/18/65
APPROVED MIT 2 June 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE ——
SHEET 5 OF 7

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	

NOTES:
1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB)
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ACSP), 8104002 (RAY), 8106001 (KIC)
3. INCORPORATED IN P/N 1901875-011 & 1901876-011
4. EFF (S/N) FOLLOWED BY ✱ ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.
5. P/N 1902299-011 REPLACES P/N 1900740-011 AND P/N 1901308-011.

	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N		
	L	2	1	5	0			L	2	1	5	0			L	2	1	5	0			L	2	1	5	0				
																													70	
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																													54	
																								X			1-	1902195-011	53	GSE PSA J-BOX
CONFIG V & UP																									X	X		1901663-021	52	PLASTIC TUBING
SEE NOTE 3																									X	X		1900866-021	51	HOSE, COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-021	50	HOSE, COOLANT INTERCONNECT F-F
SEE NOTE 3																X					2900065-011			X				1902430	49	CONNECTOR COVERS (ISS)
								X	X	X	X	X		1900009-031			X	X	X	11-	1900009-021					X	2-10	1900009-011	48	TRANSPORTATION CART G & N ASSY
															X	X				15-	1900010-021			X	X	X	1-14	1900010-011	47	IMU SHIPPING CONTAINER
									X					2900069-011			X	X	X	7-	1901846-021				X	X	1-6	1901846-011	46	G & N HARNESS HANDL. & SHIPPING FIXT.
																							X				1-	2900068-011	45	NAV BASE SHIPPING CONTAINER
																							X					2900074-011	44	OPTICS MTG FIXTURE
																							X					2900145-011	43	PTA/PEA TEST POINT ADAPTER
																							X					2900066-011	42	PTA/PEA MTG FIXTURE
																													41	CABLE BREAK-OUT BOXES
																						X	X					2900070-011	40	FIXTURE, MOUNTING, SUBSYS.
																						X	X				3-	2900024-011	39	GUIDANCE DIST. BOX
																						X	X	X	X	X	1-	1901520-011	38	CABLE INTERCONNECT (NAA-P2 TO IMU)
																X	X			1-	1902046-011				X	X	2-9	1900491-011	37	REMOTE OPTICS CONTROLLER
																						X	X				1-	2900063-011	36	LIFTING TEMP CONTROLLER
																							X	X	X	X	1-	1901492-011	35	AUXILIARY BATTERY PACK
															X	X				15-	2900060-011			X	X	X	2-14	1900342-011	34	INERTIAL COMP TEMP CONTROLLER
SEE ITEM 53 FOR CONT				X		1-2	1901933-011			X		X	3-12✱	1900268-031					X	3-12✱	190268-021					X	3-12	1900268-011	33	GSE PSA J-BOX
										X				1900797-031			X		X		1900797-021					X	1-	1900797-011	32	LOAD & SIGNAL SIMULATOR SET
															X	X					1900299-021			X	X	X	1-	1900299-011	31	DEGAUSSER ASSY
																						X	X	X	X	X	1-	1900804-011	30	IMU PRESSURE SEAL TESTER
															X	X	X	X	X	6-	1902371-011				X	X	1-5	1900803-011	29	FILLING & PURGING FIXT.
																								X	X	X		1015419	28	JUMPER BY-PASS ASSY, COOLANT FL.
																						X	X	X	X	X	1-	1900802	27	IMU SNAP-ON BELLOWS
																								X	X	X	1-	1900800-011	26	IMU MTG ALIGN CALIB. TOOL SET
																						X	X	X	X	X	1-	1900810-011	25	ROTARY TABLE CALIB. SET
															X	X	X			12-	1900926-021					X	1-11	1900926-011	24	ROTARY TABLE ASSY
																								X	X	X	1-13	1901426-011	23	NAV BASE/OPT ASSY HAND & INST FIXT.
	X						TBA		X					TBA			X				1902431-021				X	X		1902431-011	22	PSA ADAPTER MODULE
																	X	X	X	15-	1900606-021					X	3-14	1900606-011	21	PSA MTG FIXTURE
									X				10-	2900067-011			X	X	X	2-7✱	1902204-011					X	2-9	1900014-011	20	G & N MTG FIXTURE
									X				2-9✱	2900072-011			X	X	X	2-9✱	1902301-011				X	X	2-9	1900013-011	19	OPTICS/NAV BASE MTG FIXTURE
																						X	X	X	X	X	1-	1015462	18	IMU LIFTING FIXTURE
															X	X				17-	2900000-011			X	X	X	3-16	1900012-011	17	IMU MTG FIXTURE
																									X	X		1901663-011	16	TUBING, PLASTIC
SEE NOTE 3																										X		1900866-011	15	HOSE COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-011	14	HOSE COOLANT INTERCONNECT, F-F
																								X	X	X		1901876-011	13	HOSE SET, GSE COOLANT INTERCONN, G & N
																								X	X	X		1901875-011	12	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
SEE NOTE 5																										X	1-15	1901308-011	11	GSE TO G & N INTERCONNECT CABLES
SEE NOTE 5																										X	1-15	1900740-011	10	GSE TO GSE INTERCONNECT CABLES
SEE NOTE 5															X	X				16-	2900025-011			X	X	X	1-15	1902299-011	9	CABLE SET INTERCONNECT
																								X	X	X	3-17	1900805-011	8	PSA TRAY EXTENDER SET
								X	X				18-	2900037-011			X	X	X	15-17	1901981-011					X	2-3,5-14	1900931-011	7	PSA TEST POINT ADAPTER.
	X	X				18-	2900024-011			X	X	X	15-17	1901959-011				X	X	3-14✱	1900433-021					X	3-14	1900433-011	6	GSE J-BOX OVERHEAD
															X	X	X	X	X	15-	1902134-011					X	3-14	1900145-011	5	G & N COOLANT & POWER CONSOLE
															X	X	X	X	X	15-	1900000-021	X	X	X	X	X	3-14	1900000-011	4	OSCILLOGRAPH CONSOLE
																						X	X	X	X	X	1-	1900364-061	3	BLANK PANEL ASSY
	X	X	X				2900023-011			X	X	X	15-17	1901976-011				X	X	3-14✱	1900004-021					X	3-14	1900004-011	2	OPTICS INERTIAL ANALZER
	X	X					2900022-011			X				1902300-011				X		15-17	1900005-021					X	3-14	1900005-011	1	OPTICS INERTIAL TEST SET

NEXT ASSY	USED ON
1000000	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN F P [illegible] DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C. Sparling
NASA APPROVAL
MIT APPROVAL M G Marle, 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —— WT
SHEET 6 OF 7

(AM) THIS SHEET ADDED

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	

NOTES:
1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB).
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ASCP), 8104002 (RAY), 8106001 (KIC).

(AM) THIS SHEET ADDED

NOTES	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N		
																													134	
																													133	
																													132	
																							X	X	X	X		1022880	131	SCT/SXT LENS COVERS
																						X							130	AOT LENS COVERS
																						X							129	AOT PURGE VALVE COVERS
																							X	X	X	X			128	OUA PURGE VALVE COVERS
																											1-	1022896	127	CONNECTOR COVERS (OPTICS)
																						X						6014000	126	LEM AOT SHIPPING CONTAINER
																										X	1-	1019721	125	CASE ASSY, STORAGE MAP & DATA VIEWER
																								X	X	X	1-	1019700	124	SHIPPING & STORAGE CONT. OPT UNIT (INTERIM)
																X	X			9-	1019720-011				X	X	1-8	1019720	123	OPTICS-NAV BASE SHIPPING CONTAINER
																						X	X	X	X	X	1-	1019984-011	122	OPTICS CLEANING KIT
																							X	X			1-	1019926-011	121	G & N FIXTURE STAND
																							X	X			1-	1019970-011	120	STAR-HORIZON SIMULATOR CERT. FIXT.
																							X	X			1-	1019977	119	STAR-HORIZON SIMULATOR
																										X	1-	1016948	118	TESTER ASSY, MAP & DATA VIEWER
																							X	X	X	X	1-	1019840	117	RETROREFLECTING PRISM
																							X	X	X	X	1-	1019837	116	PORTABLE LIGHT ASSY
																							X	X	X	X	1-	1017376	115	WEDGE, VARIABLE DEVIATION
																							X	X	X	X	1-	1019759	114	ADJ MIRROR & PEDESTAL ASSY
																							X	X	X	X	1-	1019758	113	TOOLING BAR ASSY
																						X	X	X	X	X	1-	1017447	112	THEODOLITE & SUPPORT ASSY
																							X	X	X	X		1021640	111	LIFTING FIXT., G&N INST. QUAL/AZ REF FIXT.
																							X	X	X	X	1-	1019760	110	G & N REFERENCE CERTIFICATION FIXT.
																							X	X	X	X	1-	1017383	109	G & N INSTALL. QUALIFICATION FIXT.
																										X	1-	1017382	108	AZIMUTH REFERENCE FIXT.
																							X	X	X	X	1-	1017381	107	45° AUTOCOLLIMATOR PLATE ASSY
																							X	X	X	X	1-	1017380	106	0° AUTOCOLLIMATOR PLATE ASSY
																X	X	X	X		1017387-011				X	X	1-	1017387	105	ALIGNMENT MIRROR CERTIFICATION FIXT
																							X	X	X	X	1-	1016951	104	ALIGNMENT MIRROR ASSY
																						X					1-	6014003	103	AOT TESTER
																							X	X	X	X	1-	1019769	102	SHAFT ACCURACY TESTER
																X	X	X	X	3-	1016949-011				X	X	1-2	1016949	101	FUNCTIONAL TESTER ASSY
																							X	X			1-2	1022942	100	PTF CALIBRATION KIT
																							X	X				1019962	99	AUX PTF STAND
																X	X			3-	1016910-011				X	X	1-2	1016910	98	PRECISION TEST FIXTURE
																													97	
																													96	
																													95	
																													94	
																													93	
																													92	
																													91	
																													90	
																													89	
																													88	
																												1020423	87	CONNECTOR COVERS (AGC)
																								X	X	X	1-20	1006231	86	AGC NAV DSKY SHIPPING CONTAINER
																								X	X	X	1-20	1006229	85	AGC MAIN DSKY SHIPPING CONTAINER
															X	X				21-	1006421			X	X	X	1-20	1006230	84	AGC SHIPPING CONTAINER
																								X	X	X	1-	1014334	83	AGC NAV DSKY HANDLING FIXTURE
																								X	X	X	1-	1014377	82	AGC MAIN DSKY HANDLING FIXTURE
								X	X					2014282-011			X	X	X		1020001-003					X		1020001	81	AGC HANDLING FIXTURE
																								X	X	X		1020225	80	FIXTURE ASSY, ALIGN AGC NAV DSKY
																												1020393	79	INTERCONNECT KIT, P&M
																				12-	TBA			X	X	X	3-11	1020313	78	AGC GSE INTERCONNECT KIT, G & N
																				9-	TBA			X	X	X	3-8	1020312	77	AGC GSE INTERCONNECT KIT, SUB-SYS
																X				10-	1020343			X	X	X	1-9	1020195	76	MAIN DSKY MTG STAND
								X	X					2014044			X	X		9-	1020342					X	1-8	1014465	75	AGC/CTS OPERATION CONSOLE
																													74	AUX CALIB SYS CONSOLE
															X	X	X			9-	1020344			X	X	X	2-8	1014217	73	COMP CALIB. SYS CONSOLE
								X	X				20-	2014042			X	X		17-19	1020341					X	3-16	1014156	72	AGC TEST SET
								X	X				16-	2014048			X			12-15	1014061-011				X	X	3-11	1014061	71	COMP SIMULATOR

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
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MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN F.P. [illegible] DATE 8-12-65
CHECKED [illegible] 8-24-65
APPROVAL
APPROVAL C [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL M C Wade 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE ——
WT
SHEET 7 OF 7

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REVISIONS 00385

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3 REVISED PER TDRR 17228 Cag 3/5/65	3/3/65	
AH	REVISED PER TDRR - 17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	WK
AK	REVISED PER TDRR 18999	5-10-65	
AL	REVISED PER TDRR 19719	5-17-65	WK
AM	REVISED PER TDRR 21939	8-18-65	MGM
AN	REVISED PER TDRR 23280	10-15-65	WK

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

PRE-BASELINE

2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓).

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	P S	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-254		K	1										74	1022942-000	PTF CALIBRATION KIT
				H-23-207	DWG	M						✓				1	73	1021640	LIFTING SLING, G & N INST QUAL. FIXT./AZ REF. FIXT.
				A-23-201		A										1	72	1902431-011	PSA ADAPTER MODULE (CARRY ON)
	1021034			H-23-122	DWG	A			1	1	1	✓					71	1900009-021	G&N TRANSPORTATION CART
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-250	DWG	A							1		1		67	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
				A-23-251	DWG	A							1	1			66	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-114	DWG	A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
																	59		
																	58		
																	57		
				A-23-205	DWG	R						✓					56	1020339	AGC MOUNTING KIT
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802-011	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1				50	1900800-011	IMU MTG ALIGN CALIB. TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011/021	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005-011	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC/CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION
2900224	PSA ADAPTER MODULE MECH. DIAG. (CARRY ON)
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MASTER

MASTER

BLOCK I, O SERIES

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

APPLICATION

NEXT ASSY	USED ON
1000000	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. A. Jamm DATE Jan 27 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C. Dudley
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 7

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	

NOTES	MISC	CMRM	N D		MODEL NO.	P S	P C				371	361	351	341	331	321	311	ITEM NO.	PART NO. IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
					A-23-256		A									1		88	2900145-011	PTA/PEA TEST POINT ADAPTER
							A											87		CABLE BREAK-OUT BOXES
SEE NOTE 11					C-23-409	2014059	R							1	1	1		86	2014059	AUX CALIB SYS CONSOLE
					A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MOUNTING FIXTURE
					S-23-105	2900063	A						✓				1	84	2900063-011	LIFTING TEMP CONTROLLER
MECH DWG 1022868					H-23-194		K						✓				1	83	1022970-011	CONNECTOR COVERS (OPTICS)
					H-23-208	DWG	R						✓				1	82		CONNECTOR COVERS (AGC)
					H-23-209		A						✓				1	81	2900065-011	CONNECTOR COVERS (ISS)
MECH DWG 1019899					A-23-204	1019926	K				1							80	1019926-011	GEN FIXTURE STAND
																		79		
					H-23-206		K						✓					78		DUA PURGE VALVE COVERS
MECH DWG 1022864	& 1022870				S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
					A-23-254		K				1							76	1022942	PTF CALIBRATION KIT
MECH DWG 1022865					A-23-166		K						✓				1	75	1022880	OPTICS COVERS
MECH DWG 1019883					A-23-203	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR CERT FIXTURE
MECH DWG 1019901					A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
																		72		
																		71		
																		70		
					A-23-114		A										1	69		CABLE, INTERCONNECT (NAA-P2 TO IMU)
																		68		
																		67		
					A-23-258		A									1		66	2900277-011	MOUNTING PLATE, COMPONENT
					A-23-167		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET
																		58		
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
							A											54		
																		53		
					A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
					A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
					A-23-107	1902046	A							1				50	1902046-021	REMOTE OPTICS CONTROLLER
					A-23-192	2900024	A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
					A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY.
					S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP. TEMP. CONTROLLER
					A-23-103	2010602	A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY.
					H-23-207		M						✓				1	45	1021640	LIFTING SLING, G & N INST. QUAL. FIXT./AZ REF. FIXT.
					C-23-411		A							1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE
					A-23-093		A							1	1			43	2900067-011	G&N MTG FIXTURE
					A-23-092		A							1	1			42	2900072-011	OPTICS MTG FIXTURE
					A-23-091		A							1		1		41	2900090-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G&N, ASSY.
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYZER
1900000-011 USABLE					C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
					C-23-425	DWG	R							1				35		INTERCONNECT KIT, P & M
SEE NOTE 11					C-23-403	2014049	R					1	✓					34	2014049	COMP CALIB SYS CONSOLE
					C-23-501	TBA	R					1		1				33	2014044	AGC/CTS OPERATION CONSOLE
					C-23-402	TBA	R					1		1	1			32	2014042	AGC TEST SET
																		31		
					C-23-424	TBA	R					1		1	1			30		AGC GSE INTERCONNECT KIT G&N
					C-23-423	DWG	R					1		1				29		AGC GSE INTERCONNECT KIT SUB-SYS.
					A-23-081		R							1	1			28	1020343	DSKY MTG STAND
					H-23-190	DWG	R						✓	1	1			27	2014282-011	AGC HANDLING FIXTURE
					A-23-200		K							1	1		1	26	1019840	RETRO REFLECTING PRISM
					A-23-196		K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
					C-23-593		K							1	1			24	1019769	SHAFT ACCURACY TESTER
					A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
					A-23-199		K						✓	1	1			22	1019758	TOOLING BAR ASSY.
					A-23-252	1019962	K				1							21	1019962-011	AUX PTF STAND
MECH. DWG 1022903																		20		
					H-23-199		K						✓					19		SHIPPING & STORAGE CONTAINER, OPT UNIT
					A-23-079		K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
					A-23-097		K										1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
MECH DWG 1022866	& 1022902				A-23-096		K										1	16		AZIMUTH REFERENCE FIXTURE
					A-23-111		K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY.
					A-23-110		K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY.
					A-23-077		K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
					A-23-067		K							1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
MECH DWG 1019890					C-23-502	2010605	K				1							11	1016949-011	FUNCTIONAL TESTER ASSY.
																		10		
					A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE
					H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE
					A-23-162		A										1	7		JUMPER BY-PASS ASSY, COOLANT FL.
																		6		
					H-23-192	DWG	R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
					C-23-401	2014048	R							1		1		4	2014048	COMP. SIMULATOR
																		3		
					H-23-187	SCD	R						✓					2	1006421	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

NOTES

1. 311 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 321 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 331 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 341 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).
5. 351 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 361 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
7. 371 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.
11. CALIB. SYS CONSOLE CAN BE USED IN LIEU OF AUX. CALIB. SYS CONSOLE.

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	II, LEM
2900225	MECH. DIAG., TEST POINT ADAPTER	II, LEM
2014022	MECH. DIAG., AGC TEST SET	I, II, LEM
2014021	MECH. DIAG., AGC SIMULATOR	I, II, LEM
2014020	MECH. DIAG., AGC/CTS OPER. CONSOLE	I, II, LEM
2014019	MECH. DIAG., AUX. CALIB. SYS. CONSOLE	I, II, LEM
2014018	MECH. DIAG., AGC CALIB. SYS. CONSOLE	I, II, LEM
2900224	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/0, I/50
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	I/100, II, LEM
2900221	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/100
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	II, LEM
2900216	MECH. DIAG., OPTICS CONTROL	I/100, II
2900214	MECH. DIAG., GROUNDING	I/100, II
2900213	MECH. DIAG., GROUNDING	II, LEM
2900210	MECH. DIAG., AC POWER PROTECTION & POWER DIST.	I/100, II, LEM
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	I/100, II, LEM
2900206	MECH. DIAG., TEST SELECTOR	I/100, II, LEM
2900202	MECH. DIAG., TEST CONTROL	I/100, II
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900204	MECH. DIAG., TEMP MONITOR & CONTROL	FOR I/100 TESTING ONLY
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	I/100, II, LEM
2900203	MECH. DIAG., TEMP MONITOR & CONTROL PANEL	II, LEM
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	I/100, II, LEM
2900219	MECH. DIAG., COUNTER SIGNAL COLLECTION	I/100, II, LEM
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	I/100, II, LEM
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	I/100, II, LEM
2900215	MECH. DIAG., MEASUREMENTS REF. POWER SUPPLIES	I/100, II, LEM
2900212	MECH. DIAG., PIP & IRIG MONITORING	I/100, II, LEM
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	I/100, II, LEM
2900205	MECH. DIAG., PORT TEMP CONTROLLER	I/100, II, LEM
2900207	MECH. DIAG., MONITOR PANEL	I/100, II, LEM
2900201	MECH. DIAG., TEST CONTROL PANEL	II, LEM
2900200	MECH. DIAG., GYRO CAGING PANEL	I/100, II, LEM

MISCELLANEOUS DOCUMENTS

THIS SHEET ADDED

BLOCK II

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R.A. Jones 5-18-65
CHECKED 5/18/65
APPROVED
APPROVED C. Spalding 5/18/65
APPROVED MIT W Kupfer
APPROVED MSC A.C.
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 4 OF 7

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REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
NOTES	MISC	MANUAL	ND	MODEL NO.	P S	PG				471	461	451	441	431	421	411	ITEM NO	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-256		A							1	1	1		86	2900145-011	PTA/PEA TEST POINT ADAPTER
				A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MTG FIXTURE
				A-23-409		R							1	1	1		84		AGC AUX CALIB. SYS. CONSOLE
						K				1		✓	1	1		1	83		CONNECTOR COVERS, OPTICS
						A							1	1	1		82		CABLE BREAK-OUT BOXES
				S-23-105		A										1	81	2900063-011	LIFTING TEMP. CONTROLLER
																	80		
MECH. DWG G014001						K				1							79	G014003	AOT TESTER
				H-23-205		K						✓					78		AOT PURGE VALVE COVERS
				S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
						A						✓	1	1	1	1	76	6900001-011	CONNECTOR COVERS
				A-23-112		K						✓				1	75		OPTICS COVER, AOT
						R					1	✓	1	1		1	74		CONNECTOR COVERS, LGC SUBSYS.
																	73		
																	72		
																	71		
																	70		
				A-23-114		A										1	69		CABLE, INTERCONNECT
																	68		
																	67		
																	66		
				A-23-167		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
				A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																	63		
																	62		
						A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G&N
				A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
																	58		
				A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
				A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
				A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
																	54		
																	53		
				A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
				A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
				A-23-257		A									1		50	6900007-011	MOUNTING PLATE, COMPONENT
				A-23-102		A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
				A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY
				S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP TEMP CONTROLLER
				A-23-103		A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY
																	45		
				C-23-411		A							1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE
																	43		
																	42		
				A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE
				H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER
				H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART G&N ASSY
				NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
				C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYSER
				C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
						R							1				35		INTERCONNECT KIT, P&M
				C-23-403		R					1		1	1	1		34	1020344	COMP CALIB SYS CONSOLE
				C-23-501		R					1		1				33	2014044	AGC/CTS OPERATION CONSOLE
				C-23-402		R					1		1	1			32	2014042	AGC TEST SET
																	31		
				C-23-424		R					1		1	1			30		AGC GSE INTERCONNECT KIT G&N
				C-23-423		R					1		1				29		AGC GSE INTERCONNECT KIT SUB-SYS
																	28		
				H-23-190		R						✓					27	2014282-011	AGC HANDLING FIXTURE
																	26		
																	25		
																	24		
																	23		
																	22		
																	21		
																	20		
MECH. DWG G014002				A-23-128		K						✓					19	6014000	LEM AOT SHIPPING CONTAINER
				A-23-079		K						✓					18	1017447	THEODOLITE & SUPPORT ASSY
																	17		
																	16		
																	15		
																	14		
																	13		
																	12		
																	11		
																	10		
																	9		
				H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE
				A-23-162		A										1	7		JUMPER BY-PASS ASSY COOLANT FL.
																	6		
				H-23-192		R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
				C-23-401		R							1		1		4	2014048	COMP SIMULATOR
																	3		
				H-23-187		R						✓					2	1006421	AGC SHIPPING CONTAINER
				H-23-188		R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

NOTES:
1. 411 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING
2. 421 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING
3. 431 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING
4. 441 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N)
5. 451 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 461 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS TESTING)
7. 471 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R&I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

MISCELLANEOUS DOCUMENTS		
DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G&N INTERFACE	
2900225	MECH. DIAG., TEST POINT ADAPTER	
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	
G014010	MECH. DWG, LEM AOT PROTECTIVE COVERS	
2900213	MECH. DIAG., GROUNDING	
2900210	MECH. DIAG., AC POWER PROTECTION & POW. DIST.	
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	
2900206	MECH. DIAG., TEST SELECTOR	
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	
2900203	MECH. DIAG., TEMP MONITOR & CONTROL	
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	
2900219	MECH. DIAG., COUNTER SIGNAL SELECTION	
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	
2900215	MECH. DIAG., MEASUREMENT REF. POWER SUPPLIES	
2900212	MECH. DIAG., PIP & IRIG MONITORING	
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	
2900207	MECH. DIAG., MONITOR PANEL	
2900205	MECH. DIAG., PORTABLE TEMP CONTROLLER	
2900201	MECH. DIAG., TEST CONTROL PANEL	
2900200	MECH. DIAG., GYRO CAGING PANEL	

THIS SHEET ADDED

LEM

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

APPLICATION	
NEXT ASSY	USED ON
1000000	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN F. P. G. 5-13-65
CHECKED 5/18/65
APPROVED
APPROVED C. Spalding 5/18/65
APPROVED MIT W. Kupfer 2 June 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE ——
SHEET 5 OF 7

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	
AN	REVISED PER TDDR 23280	10-13-65	

	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I								
	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	ITEM	NOMENCLATURE OR DESCRIPTION
																													70	
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																													68	
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																													57	
																													56	
																													55	
																							X				1-	2900677-011	54	MOUNTING PLATE, COMPONENT
CONFIG V & UP																								X			1-	1902195-011	53	GSE PSA J-BOX
SEE NOTE 3																									X	X		1901663-021	52	PLASTIC TUBING
SEE NOTE 3																									X	X		1900866-021	51	HOSE, COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-021	50	HOSE, COOLANT INTERCONNECT F-F
								X						6900001-011		X					2900065-011			X				1902430	49	CONNECTOR COVERS (ISS)
								X	X	X	X	X		1900009-031			X	X	X	11-	1900009-021					X	2-10	1900009-011	48	TRANSPORTATION CART G & N ASSY
															X	X				15-	1900010-021			X	X	X	1-14	1900010-011	47	IMU SHIPPING CONTAINER
																	X	X	X	7-	1901846-021				X	X	1-6	1901846-011	46	G & N HARNESS HANDL. & SHIPPING FIXT.
																													45	
																													44	
																						X	X				1-	2900145-011	43	PTA/PEA TEST POINT ADAPTER
																						X	X				1-	2900066-011	42	PTA/PEA MTG FIXTURE
																													41	CABLE BREAK-OUT BOXES
																						X	X				1-	2900070-011	40	FIXTURE, MOUNTING, SUBSYS.
																						X	X				3-	2900024-011	39	GUIDANCE DIST. BOX
																								X	X	X	1-	1901520-011	38	CABLE INTERCONNECT (NAA-P2 TO IMU)
									X	X				1902046-021			X			1-	1902046-011				X	X	2-9	1900491-011	37	REMOTE OPTICS CONTROLLER
																						X	X				1-	2900063-011	36	LIFTING TEMP CONTROLLER
																X	X				1901492-021				X	X	1-	1901492-011	35	AUXILIARY BATTERY PACK
															X	X				15-	2900060-011			X	X	X	2-14	1900342-011	34	INERTIAL COMP TEMP CONTROLLER
SEE ITEM 53 FOR CONT				X		1-2	1901933-011			X		X	3-12*	1900268-031					X	3-12*	1900268-021					X	3-12	1900268-011	33	GSE PSA J-BOX
										X				1900797-031			X		X		1900797-021				X	X	1-	1900797-011	32	LOAD & SIGNAL SIMULATOR SET
															X	X				7-	1900299-021			X	X	X	1-6	1900299-011	31	DEGAUSSER ASSY
																						X	X	X	X	X	1-	1900804-011	30	IMU PRESSURE SEAL TESTER
															X	X	X	X	X	6-	1902371-011				X	X	1-5	1900803-011	29	FILLING & PURGING FIXT.
																								X	X	X		1015418	28	JUMPER BY-PASS ASSY, COOLANT FL.
																						X	X	X	X	X	1-	1900802-011	27	IMU SNAP-ON BELLOWS
																								X	X	X	1-	1900800-011	26	IMU MTG ALIGN CALIB. TOOL SET
																						X	X	X	X	X	1-	1900810-011	25	ROTARY TABLE CALIB. SET
															X	X	X			12-	1900926-021				X	X	1-11	1900926-011	24	ROTARY TABLE ASSY
																								X	X	X	1-13	1901426-011	23	NAV BASE/OPT ASSY HAND & INST FIXT.
	X						TBA		X					TBA			X				1902431-021				X	X		1902431-011	22	PSA ADAPTER MODULE
																	X	X	X	15-	1900606-021					X	3-14	1900606-011	21	PSA MTG FIXTURE
									X				10-	2900067-011			X	X	X	2-7 *	1902204-011					X	2-9	1900014-011	20	G & N MTG FIXTURE
									X				2-9 *	2900072-011			X	X	X	2-9 *	1902301-011				X	X	2-9	1900013-011	19	OPTICS/NAV BASE MTG FIXTURE
																								X	X	X	1-	1015462	18	IMU LIFTING FIXTURE
															X	X				1-	2900000-011			X	X	X	3-16	1900012-011	17	IMU MTG FIXTURE
SEE NOTE 3																									X	X		1901663-011	16	TUBING, PLASTIC
SEE NOTE 3																									X	X		1900866-011	15	HOSE COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-011	14	HOSE COOLANT INTERCONNECT, F-F
																								X	X	X		1901876-011	13	HOSE SET, GSE COOLANT INTERCONN, G & N
																								X	X	X		1901875-011	12	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
SEE NOTE 5																									X	X	1-15	1901308-011	11	GSE TO G & N INTERCONNECT CABLES
SEE NOTE 5																									X	X	1-15	1900740-011	10	GSE TO GSE INTERCONNECT CABLES
SEE NOTE 5															X	X				16-	2900025-011			X	X	X	1-15	1902299-011	9	CABLE SET INTERCONNECT
																								X	X	X	3-17	1900805-011	8	PSA TRAY EXTENDER SET
								X	X				8-	2900037-011			X	X	X	15-17	1901981-011					X	2-3,5-14	1900931-011	7	PSA TEST POINT ADAPTER
										X	X	X	15-17	1901959-011				X	X	3-14 *	1900433-021					X	3-14	1900433-011	6	GSE J-BOX OVERHEAD
								X	X				17-	1902134-021			X	X	X	15-16	1902134-011					X	3-14	1900145-011	5	G & N COOLANT & POWER CONSOLE
															X	X	X	X	X	15-	1900030-021	X	X	X	X	X	3-14	1900000-011	4	OSCILLOGRAPH CONSOLE
																						X	X	X	X	X	1-	1900364-061	3	BLANK PANEL ASSY
	X	X	X			18-	2900023-011			X	X	X	3-17+	1901876-011				X	X	3-14 *	1900004-021					X	3-14	1900004-011	2	OPTICS INERTIAL ANALZER
	X	X					2900022-011			X				1902300-011				X		15-17	1900005-021					X	3-14	1900005-011	1	OPTICS INERTIAL TEST SET

NOTES:

1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB)
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ACSP), 8104002 (RAY), 8106001 (KIC)
3. INCORPORATED IN P/N 1901875-011 & 1901876-011
4. EFF (S/N) FOLLOWED BY * ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.
5. P/N 1902299-011 REPLACES P/N 1900740-011 AND P/N 1901308-011.
6. + THREE (3) NEW BUY OIA'S BUILT TO I/O CONFIGURATION AND RETROFITTED IN LINE.

(AM) THIS SHEET ADDED

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

1000000	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN F.P. [illegible] DATE 8-12-65
CHECKED [illegible]
APPROVAL
APPROVAL C. Sparling
NASA APPROVAL
MIT APPROVAL M.G. Marks, 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 6 OF 7

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	
AN	REVISED PER TDDR 23260	10-13-65	

NOTES:

1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB).
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ASCP), 8104002 (RAY), 8106001 (KIC).
3. EFF. (S/N) FOLLOWED BY AN ASTERISK (*) ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.

NOTES	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N		
																													134	
																													133	
																													132	
																							X	X	X	X	1-36	1022880	131	SCT/SXT LENS COVERS
																						X							130	AOT LENS COVERS
																						X							129	AOT PURGE VALVE COVERS
																							X	X	X	X			128	OUA PURGE VALVE COVERS
																							X	X			1-37	1022970-011	127	CONNECTOR COVERS (OPTICS)
																						X						6014000	126	LEM AOT SHIPPING CONTAINER
																									X	X	1-3	1019721	125	CASE ASSY, STORAGE MAP & DATA VIEWER
																								X	X	X	1-5	1019700	124	SHIPPING & STORAGE CONT. OPT UNIT (INTERIM)
																	X			9-*	1019720-011				X	X	1-13	1019720	123	OPTICS-NAV BASE SHIPPING CONTAINER
																						X	X	X	X	X	1-7	1019984-011	122	OPTICS CLEANING KIT
																								X			1-8	1019926-011	121	G & N FIXTURE STAND
																							X	X			1-7	1019970-011	120	STAR-HORIZON SIMULATOR CERT. FIXT.
																							X	X			1-8	1019977	119	STAR-HORIZON SIMULATOR
																									X	X	1-3	1016348	118	TESTER ASSY, MAP & DATA VIEWER
																							X	X	X	X	1-7	1019840	117	RETROREFLECTING PRISM
																							X	X	X	X	1-9	1019837	116	PORTABLE LIGHT ASSY
																							X	X	X	X	1-9	1017376	115	WEDGE, VARIABLE DEVIATION
																							X	X	X	X	1-5	1019759	114	ADJ MIRROR & PEDESTAL ASSY
																							X	X	X	X	1	1019758	113	TOOLING BAR ASSY
																						X	X	X	X	X	1-7	1017447	112	THEODOLITE & SUPPORT ASSY
																							X	X	X	X		1021640	111	LIFTING FIXT., G & N INST. QUAL/AZ REF FIXT.
																							X	X	X	X	1-3	1019760	110	G & N REFERENCE CERTIFICATION FIXT.
																							X	X	X	X	1-3	1017383	109	G & N INSTALL. QUALIFICATION FIXT.
																X					1017382-011					X	1-5	1017382	108	AZIMUTH REFERENCE FIXT.
																							X	X	X	X	1-12	1017381	107	45° AUTOCOLLIMATOR PLATE ASSY
																							X	X	X	X	1-22	1017380	106	0° AUTOCOLLIMATOR PLATE ASSY
																X	X	X	X	6-	1017387-011				X	X	1-5	1017387	105	ALIGNMENT MIRROR CERTIFICATION FIXT
																X	X	X	X	6-	1016951-011				X	X	1-5	1016951	104	ALIGNMENT MIRROR ASSY
																						X					1-	6014003	103	AOT TESTER
																							X	X	X	X	1-3	1019769	102	SHAFT ACCURACY TESTER
																X	X	X	X	3-	1016949-011				X	X	1-2	1016949	101	FUNCTIONAL TESTER ASSY
																X	X				1022942-011*				X	X	1-3	1022942-000	100	PTF CALIBRATION KIT
																							X	X			1-4	1019962-011	99	AUX PTF STAND
																X	X	X	X	3-	1016910-011				X	X	1-2	1016910	98	PRECISION TEST FIXTURE
																													97	
																													96	
																													95	
																													94	
																													93	
																													92	
																						X	X					2014013-011	91	AGC UNIV. DSKY HANDLING FIXTURE
																						X	X					1006422	90	AGC UNIV. DSKY SHIPPING CONTAINER
																								X				1020338	89	AGC MOUNTING KIT
																									X	X		1020339	88	AGC MOUNTING KIT
																								X				1020423	87	CONNECTOR COVERS (AGC)
																								X	X	X	1-20	1006231	86	AGC NAV DSKY SHIPPING CONTAINER
																								X	X	X	1-20	1006229	85	AGC MAIN DSKY SHIPPING CONTAINER
															X	X				21-	1006421			X	X	X	1-20	1006230	84	AGC SHIPPING CONTAINER
																								X	X	X	1-	1014334	83	AGC NAV DSKY HANDLING FIXTURE
																								X	X	X	1-	1014377	82	AGC MAIN DSKY HANDLING FIXTURE
								X	X					2014282-011			X	X	X		1020001-003					X		1020001	81	AGC HANDLING FIXTURE
																								X	X	X		1020225	80	FIXTURE ASSY, ALIGN AGC NAV DSKY
																												1020393	79	INTERCONNECT KIT, P & M
																				12-	TBA			X	X	X	3-11	1020313	78	AGC GSE INTERCONNECT KIT, G & N
																				9-	TBA			X	X	X	3-8	1020312	77	AGC GSE INTERCONNECT KIT, SUB-SYS
																X	X	X		10-	1020343					X	1-9	1020195	76	MAIN DSKY MTG STAND
								X	X					2014044			X	X		9-	1020342					X	1-8	1014465	75	AGC/CTS OPERATION CONSOLE
																						X	X	X				2014059	74	AUX CALIB SYS CONSOLE
															X	X	X			9-	1020344			X	X	X	2-8	1014217	73	COMP CALIB. SYS CONSOLE
								X	X				20-	2014042			X	X		17-19	1020341					X	3-16	1014156	72	AGC TEST SET
								X	X				16-	2014048			X			12-15	1014061-011				X	X	3-11	1014061	71	COMP SIMULATOR

1000000	
NEXT ASSY	USED ON
APPLICATION	

(AM) THIS SHEET ADDED

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN F.P. Russo DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C. Sperling
NASA APPROVAL
MIT APPROVAL M.C. Meade 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230 SIZE D NASA DRAWING NO. 1900030
SCALE — WT SHEET 7 OF 7

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	P S	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-254		K	1										74	1022942-000	PTF CALIBRATION KIT
				H-23-207	DWG	M						✓				1	73	1021640	LIFTING SLING, G & N INST QUAL. FIXT./AZ REF. FIXT.
				A-23-201		A										1	72	1902431-011	PSA ADAPTER MODULE (CARRY ON)
	1021034			H-23-122	DWG	A			1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-250	DWG	A							1		1		67	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
				A-23-251	DWG	A							1	1			66	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-114	DWG	A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
																	59		
																	58		
																	57		
				A-23-205	DWG	R						✓					56	1020339	AGC MOUNTING KIT
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802-011	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011/021	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C 23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005-011	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-90	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC/CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C 23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

APPLICATION	
NEXT ASSY	USED ON
1000000	

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

PRE-BASELINE

2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓)

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS 00995

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15881	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3. REVISED PER TDRR 17228 Cag 2/9/65	2/9/65	
AH	REVISED PER TDRR - 17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	
AK	REVISED PER TDRR 18999	5-10-65	
AL	REVISED PER TDRR 19719	5-17-65	
AM	REVISED PER TDRR 21939	8-18-65	MGM
AN	REVISED PER TDRR 23280	10-15-65	
AP	REVISED PER TDRR 23537	10-28-65	

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION
2900224	PSA ADAPTER MODULE MECH. DIAG. (CARRY ON)
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MASTER

MASTER

BLOCK I, 0 SERIES

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R.A. J DATE 1965
CHECKED 2/2/65
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 7

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DOCUMENTS							QUANTITY REQUIRED											END ITEM		
NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-254		K				1							76	1022942-000	PTF CALIBRATION KIT
					H-23-207	DWG	M						✓				1	75	1021640	LIFTING FIXT. G & N INST. QUAL. FIXT./AZ REF. FIXT
					A-23-201		A										1	74	1902431-011	PSA ADAPTER MODULE (CARRY ON)
					N.A.	—	A							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.
					A-23-250	DWG	A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA [illegible] TO IMU)
					S-23-101	1901492-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198	—	A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080	—	A							1		1		64	1900926-011	ROTARY TABLE ASSY
						DWG	K							1	1	1		63	1022934	CABLE W17
																		62		
																		61		
																		60		
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100	—	A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108	—	A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102	—	A							1	1	1		49	1900433-011 *	GSE -J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901933	A	PART OF 1901930										45	1901933-011	GSE PSA-J BOX
		1021035		1900005	C-23-411	—	A							1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G&N ASSY
		1021035		1900005	N.A.	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404	—	A							1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500	—	A							1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					C-23-425	—	R							1				35	1020393	INTERCONNECT KIT P & M
					C-23-403	—	R					1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE
					C-23-501	1020342	R					1		1				33	1020342	AGC/CTS OPEPATION CONSOLE
					C-23-402	—	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	—	R					1		1				31	1020339	MOUNTING KIT
					C-23-424	—	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT. G & N
					C-23-423	—	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-130		R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720-011	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	—	R							1		1		4	1014061-011	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17226	RJ			
AH		REVISED PER TDRR -17571			2-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK
AK		REVISED PER TDRR 18999	F.P.G		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-12-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
AP		REVISED PER TDRR 23537	F.P.G.		10-28-65	WK

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900224	MECH DWG, PSA ADAPTER MODULE (CARRY ON)	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S.S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

(AG) THIS SHEET ADDED

BLOCK I
50 SERIES

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

APPLICATION

NEXT ASSY	USED ON
1000000	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Sperling 3/9/65
APPROVED MIT 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 2 OF 7

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-8-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	

NOTES	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
	MISC	CMRM	N D		MODEL NO.	P S	P C				371	361	351	341	331	321	311	ITEM NO.	PART NO. IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-256		A									1		88	2900145-011	PTA/PEA TEST POINT ADAPTER
							A											87		CABLE BREAK-OUT BOXES
SEE NOTE 11					C-23-409	2014059	R							1	1	1		86	2014058-011	AUX CALIB SYS CONSOLE
					A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MOUNTING FIXTURE
					S-23-105	2900063	A						✓				1	84	2900063-011	LIFTING TEMP CONTROLLER
MECH DWG 1022868					H-23-194		K						✓				1	83	1022970-011	CONNECTOR COVERS (OPTICS)
					H-23-208	DWG	R						✓				1	82		CONNECTOR COVERS (AGC)
					H-23-209		A						✓				1	81	2900065-011	CONNECTOR COVERS (ISS)
MECH DWG 1019899					A-23-204	1019926	K				1							80	1019926-011	GEN FIXTURE STAND
																		79		
					H-23-206		K						✓					78		DUA PURGE VALVE COVERS
MECH DWG 1022864	& 1022870				S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
					A-23-254		K				1							76	1022942	PTF CALIBRATION KIT
MECH DWG 1022865					A-23-166		K						✓				1	75	1022880	OPTICS COVERS
MECH DWG 1019883					A-23-203	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR CERT FIXTURE
MECH DWG 1019901					A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
																		72		
																		71		
																		70		
					A-23-114		A										1	69		CABLE INTERCONNECT (NAA-P2 TO IMU)
																		68		
																		67		
					A-23-258		A									1		66	2900277-011	MOUNTING PLATE, COMPONENT
					A-23-167		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
																		58		
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
							A											54		
																		53		
					A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
					A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
					A-23-107	1902046	A							1				50	1902046-021	REMOTE OPTICS CONTROLLER
					A-23-192	2900024	A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
					A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY.
					S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP. TEMP. CONTROLLER
					A-23-103	2010602	A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY.
					H-23-207		M						✓				1	45	1021640	LIFTING SLING, G & N INST. QUAL. FIXT./AZ REF FIXT.
					C-23-411		A							1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE
					A-23-093		A							1	1			43	2900067-011	G&N MTG FIXTURE
					A-23-092		A							1	1			42	2900072-011	OPTICS MTG FIXTURE
					A-23-091		A							1		1		41	2900090-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G&N, ASSY.
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYZER
1900000-011 USABLE					C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
					C-23-425	DWG	R							1				35		INTERCONNECT KIT, P & M
SEE NOTE 11					C-23-403	2014049	R					1	✓					34	2014049-011	COMP CALIB SYS CONSOLE
					C-23-501	TBA	R					1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE
					C-23-402	TBA	R					1		1	1			32	2014042-011	AGC TEST SET
																		31		
					C-23-424	TBA	R					1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G&N
					C-23-423	DWG	R					1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS.
					A-23-081		R							1	1			28	2014014-011	DSKY MTG STAND
					H-23-190	DWG	R						✓	1	1			27	2014282-011	AGC HANDLING FIXTURE
					A-23-200		K							1	1		1	26	1019840	RETRO REFLECTING PRISM
					A-23-196		K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
					C-23-593		K							1	1			24	1019769	SHAFT ACCURACY TESTER
					A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
					A-23-199		K						✓	1	1			22	1019758	TOOLING BAR ASSY.
					A-23-252	1019962	K				1							21	1019962-011	AUX PTF STAND
																		20		
MECH. DWG 1022903					H-23-199		K						✓					19		SHIPPING & STORAGE CONTAINER, OPT UNIT
					A-23-079		K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
					A-23-097		K										1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
MECH DWG 1022366	& 1022902				A-23-096		K										1	16		AZIMUTH REFERENCE FIXTURE
					A-23-111		K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY.
					A-23-110		K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY.
					A-23-077		K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
					A-23-067		K							1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
MECH DWG 1019890					C-23-502	2010605	K				1							11	1016949-011	FUNCTIONAL TESTER ASSY.
																		10		
					A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE
					H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE
					A-23-162		A										1	7		JUMPER BY-PASS ASSY, COOLANT FL.
																		6		
					H-23-192	DWG	R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
					C-23-401	2014048	R							1		1		4	2014048-011	COMP. SIMULATOR
																		3		
					H-23-187	SCD	R						✓					2	1006421	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

NOTES

1. 311 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 321 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 331 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 341 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS / OSS / G&N / CSS).
5. 351 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 361 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
7. 371 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.
11. CALIB. SYS CONSOLE CAN BE USED IN LIEU OF AUX. CALIB. SYS CONSOLE.

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	II, LEM
2900225	MECH. DIAG., TEST POINT ADAPTER	II, LEM
2014022	MECH. DIAG., AGC TEST SET	I, II, LEM
2014021	MECH. DIAG., AGC SIMULATOR	I, II, LEM
2014020	MECH. DIAG., AGC/CTS OPER. CONSOLE	I, II, LEM
2014019	MECH. DIAG., AUX. CALIB. SYS. CONSOLE	I, II, LEM
2014018	MECH. DIAG., AGC CALIB. SYS. CONSOLE	I, II, LEM
2900224	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/0, I/50
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	I/100, II, LEM
2900221	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/100
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	II, LEM
2900216	MECH. DIAG., OPTICS CONTROL	I/100, II
2900214	MECH. DIAG., GROUNDING	I/100, II
2900213	MECH. DIAG., GROUNDING	II, LEM
2900210	MECH. DIAG., AC POWER PROTECTION & POWER DIST.	I/100, II, LEM
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	I/100, II, LEM
2900206	MECH. DIAG., TEST SELECTOR	I/100, II, LEM
2900202	MECH. DIAG., TEST CONTROL	I/100, II
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900204	MECH. DIAG., TEMP MONITOR & CONTROL	FOR I/100 TESTING ONLY
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	I/100, II, LEM
2900203	MECH. DIAG., TEMP MONITOR & CONTROL PANEL	II, LEM
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	I/100, II, LEM
2900219	MECH. DIAG., COUNTER SIGNAL COLLECTION	I/100, II, LEM
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	I/100, II, LEM
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	I/100, II, LEM
2900215	MECH. DIAG., MEASUREMENTS REF. POWER SUPPLIES	I/100, II, LEM
2900212	MECH. DIAG., PIP & IRIG MONITORING	I/100, II, LEM
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	I/100, II, LEM
2900205	MECH. DIAG., PORT TEMP CONTROLLER	I/100, II, LEM
2900207	MECH. DIAG., MONITOR PANEL	I/100, II, LEM
2900201	MECH. DIAG., TEST CONTROL PANEL	II, LEM
2900200	MECH. DIAG., GYRO CAGING PANEL	I/100, II, LEM

THIS SHEET ADDED

BLOCK II

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

APPLICATION

NEXT ASSY	USED ON
1000000	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. a. Jones 5-19-65
CHECKED 5/18/65
APPROVED
APPROVED C. Sparling 5/18/65
APPROVED MIT
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 4 OF 7

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SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	JK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	WK

REVISIONS

NOTES:

1. 411 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING
2. 421 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING
3. 431 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING
4. 441 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N)
5. 451 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 461 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS TESTING)
7. 471 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

NOTES	MISC	MANUAL	N D		MODEL NO.	P S	PC				471	461	451	441	431	421	411	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-256		A							1	1	1		86	2900145-011	PTA/PEA TEST POINT ADAPTER
					A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MTG FIXTURE
					A-23-409		R							1	1	1		84	2014059-011	AGC AUX CALIB. SYS. CONSOLE
							K				1		✓	1	1		1	83		CONNECTOR COVERS, OPTICS
							A							1	1	1		82		CABLE BREAK-OUT BOXES
					S-23-105		A										1	81	2900063-011	LIFTING TEMP. CONTROLLER
																		80		
MECH. DWG G014001							K				1							79	G014003	AOT TESTER
					H-23-205		K						✓					78		AOT PURGE VALVE COVERS
					S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
							A						✓	1	1	1	1	76	6900001-011	CONNECTOR COVERS
					A-23-112		K						✓				1	75		OPTICS COVER, AOT
							R					1	✓	1	1		1	74		CONNECTOR COVERS, LGC SUBSYS.
																		73		
																		72		
																		71		
																		70		
					A-23-114		A										1	69		CABLE, INTERCONNECT
																		68		
																		67		
																		66		
					A-23-167		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
																		58		
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
																		54		
															1	1		53	6900043-011	CABLE SET INTERCONNECT
					A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
					A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
					A-23-257		A									1		50	6900007-011	MOUNTING PLATE, COMPONENT
					A-23-102		A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
					A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY
					S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP TEMP CONTROLLER
					A-23-103		A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY
																		45		
					C-23-411		A							1	1	1		44	1902134-021*	G & N COOLANT & POWER CONSOLE
																		43		
																		42		
					A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART G & N ASSY
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYSER
					C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
							R							1				35	2014064-011	INTERCONNECT KIT, P & M
					C-23-403		R					1		1	1	1		34	2014049-011	COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32	2014042-011	AGC TEST SET
																		31		
					C-23-424		R					1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G & N
					C-23-423		R					1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS
																		28		
					H-23-190		R						✓					27	2014282-011	AGC HANDLING FIXTURE
																		26		
																		25		
																		24		
																		23		
																		22		
																		21		
																		20		
					A-23-128		K						✓					19	G014000	LEM AOT SHIPPING CONTAINER
MECH. DWG G014002					A-23-079		K						✓					18	1017447	THEODOLITE & SUPPORT ASSY.
																		17		
																		16		
																		15		
																		14		
																		13		
																		12		
																		11		
																		10		
																		9		
					H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE
					A-23-162		A										1	7		JUMPER BY-PASS ASSY COOLANT FL.
																		6		
					H-23-192		R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
					C-23-401		R							1		1		4	2014048-011	COMP SIMULATOR
																		3		
					H-23-187		R						✓					2	1006421	AGC SHIPPING CONTAINER
					H-23-188		R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER
DOCUMENTS							QUANTITY REQUIRED											END ITEM		

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	
2900225	MECH. DIAG., TEST POINT ADAPTER	
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	
G014010	MECH. DWG, LEM AOT PROTECTIVE COVERS	
2900213	MECH. DIAG., GROUNDING	
2900210	MECH. DIAG., AC POWER PROTECTION & POW. DIST.	
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	
2900206	MECH. DIAG., TEST SELECTOR	
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	
2900203	MECH. DIAG., TEMP MONITOR & CONTROL	
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	
2900219	MECH. DIAG., COUNTER SIGNAL SELECTION	
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	
2900215	MECH. DIAG., MEASUREMENT REF. POWER SUPPLIES	
2900212	MECH. DIAG., PIP & IRIG MONITORING	
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	
2900207	MECH. DIAG., MONITOR PANEL	
2900205	MECH. DIAG., PORTABLE TEMP CONTROLLER	
2900201	MECH. DIAG., TEST CONTROL PANEL	
2900200	MECH. DIAG., GYRO CAGING PANEL	

MISCELLANEOUS DOCUMENTS

THIS SHEET ADDED

LEM

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN F. P. Grasso 5-13-65
CHECKED 5/1?/65
APPROVED
APPROVED C. Sparling 5/17/65
APPROVED MIT W Kupfer 2 June 65
APPROVED MSC 6/2/65
DATE

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 5 OF 7

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	
AN	REVISED PER TDDR 23280	10-13-65	
AP	REVISED PER TDRR 23537	11-1-65	

NOTES:
1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER, AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB)
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ACSP), 8104002 (RAY), 8106001 (KIC)
3. INCORPORATED IN P/N 1901875-011 & 1901876-011
4. EFF (S/N) FOLLOWED BY ✱ ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.
5. P/N 1902299-011 REPLACES P/N 1900740-011 AND P/N 1901308-011.
6. + THREE (3) NEW BUY OIA'S BUILT TO I/O CONFIGURATION AND RETROFITTED IN LINE.

	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N		
	L	2	1	5	0			L	2	1	5	0			L	2	1	5	0			L	2	1	5	0				
																													70	
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																													56	
																							☒					1-	6900043-011	55	CABLE SET, INTERCONNECT
																								☒				1-	2900677-011	54	MOUNTING PLATE, COMPONENT
CONFIG II & UP																									☒			1-	1902195-011	53	GSE PSA J-BOX
SEE NOTE 3																										☒	☒		1901663-021	52	PLASTIC TUBING
SEE NOTE 3																										☒	☒		1900866-021	51	HOSE, COOLANT INTERCONNECT M-F
SEE NOTE 3																										☒	☒		1900867-021	50	HOSE, COOLANT INTERCONNECT F-F
								☒						6900001-011		☒					2900065-011			☒				1902430	49	CONNECTOR COVERS (ISS)
								☒	☒	☒	☒	☒		1900009-031			☒	☒	☒	11-	1900009-021					☒	2-10	1900009-011	48	TRANSPORTATION CART G & N ASSY
															☒	☒				15-	1900010-021			☒	☒	☒	1-14	1900010-011	47	IMU SHIPPING CONTAINER
																	☒	☒	☒	7-	1901846-021				☒	☒	1-6	1901846-011	46	G & N HARNESS HANDL. & SHIPPING FIXT.
																													45	
																													44	
																						☒	☒				1-	2900145-011	43	PTA/PEA TEST POINT ADAPTER
																						☒	☒				1-	2900066-011	42	PTA/PEA MTG FIXTURE
																													41	CABLE BREAK-OUT BOXES
																						☒	☒				1-	2900070-011	40	FIXTURE, MOUNTING, SUBSYS.
																						☒	☒				3-	2900024-011	39	GUIDANCE DIST. BOX
																								☒	☒	☒	1-	1901520-011	38	CABLE INTERCONNECT (NAA-P2 TO IMU)
									☒	☒				1902046-021			☒			1-	1902046-011				☒	☒	2-9	1900491-011	37	REMOTE OPTICS CONTROLLER
																						☒	☒				1-	2900063-011	36	LIFTING TEMP CONTROLLER
																☒	☒				1901492-021				☒	☒	1-	1901492-011	35	AUXILIARY BATTERY PACK
															☒	☒				15-	2900060-011			☒	☒	☒	2-14	1900342-011	34	INERTIAL COMP TEMP CONTROLLER
SEE ITEM 53 FOR CONT				☒		1-2	1901933-011			☒		☒	3-12✱	1900268-031					☒	3-12✱	1900268-021					☒	3-12	1900268-011	33	GSE PSA J-BOX
										☒				1900797-031			☒		☒		1900797-021				☒	☒	1-	1900797-011	32	LOAD & SIGNAL SIMULATOR SET
															☒	☒				7-	1900299-021			☒	☒	☒	1-6	1900299-011	31	DEGAUSSER ASSY
																						☒	☒	☒	☒	☒	1-	1900804-011	30	IMU PRESSURE SEAL TESTER
															☒	☒	☒	☒	☒	6-	1902371-011				☒	☒	1-5	1900803-011	29	FILLING & PURGING FIXT.
																								☒	☒	☒		1015419	28	JUMPER BY-PASS ASSY, COOLANT FL.
																						☒	☒	☒	☒	☒	1-	1900802-011	27	IMU SNAP-ON BELLOWS
																								☒	☒	☒	1-	1900800-011	26	IMU MTG ALIGN CALIB. TOOL SET
																						☒	☒	☒	☒	☒	1-	1900810-011	25	ROTARY TABLE CALIB. SET
															☒	☒	☒			12-	1900926-021				☒	☒	1-11	1900926-011	24	ROTARY TABLE ASSY
																								☒	☒	☒	1-13	1901426-011	23	NAV BASE/OPT ASSY HAND & INST FIXT.
							TBA		☒					TBA			☒				1902431-021				☒	☒		1902431-011	22	PSA ADAPTER MODULE
																	☒	☒	☒	15-	1900606-021					☒	3-14	1900606-011	21	PSA MTG FIXTURE
									☒				10-	2900067-011			☒	☒	☒	2-7✱	1902204-011					☒	2-9	1900014-011	20	G & N MTG FIXTURE
									☒				2-9✱	2900072-011			☒	☒	☒	2-9✱	1902301-011				☒	☒	2-9	1900013-011	19	OPTICS/NAV BASE MTG FIXTURE
																								☒	☒	☒	1-	1015462	18	IMU LIFTING FIXTURE
															☒	☒				1-	2900000-011			☒	☒	☒	3-16	1900012-011	17	IMU MTG FIXTURE
SEE NOTE 3																									☒	☒		1901663-011	16	TUBING, PLASTIC
SEE NOTE 3																									☒	☒		1900866-011	15	HOSE COOLANT INTERCONNECT M-F
SEE NOTE 3																									☒	☒		1900867-011	14	HOSE COOLANT INTERCONNECT, F-F
																								☒	☒	☒		1901876-011	13	HOSE SET, GSE COOLANT INTERCONN, G & N
																								☒	☒	☒		1901875-011	12	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
SEE NOTE 5																									☒	☒	1-15	1901308-011	11	GSE TO G & N INTERCONNECT CABLES
SEE NOTE 5																									☒	☒	1-15	1900740-011	10	GSE TO GSE INTERCONNECT CABLES
SEE NOTE 5															☒	☒				16-	2900025-011			☒	☒	☒	1-15	1902299-011	9	CABLE SET INTERCONNECT
																								☒	☒	☒	3-17	1900805-011	8	PSA TRAY EXTENDER SET
								☒	☒				8-	2900037-011			☒	☒	☒	15-17	1901981-011					☒	2-3,5-14	1900931-011	7	PSA TEST POINT ADAPTER
										☒	☒	☒	15-17	1901959-011				☒	☒	3-14✱	1900433-021					☒	3-14	1900433-011	6	GSE J-BOX OVERHEAD
								☒					17-	1902134-021			☒	☒	☒	15-16	1902134-011					☒	3-14	1900145-011	5	G & N COOLANT & POWER CONSOLE
															☒	☒	☒	☒	☒	15-	1900000-021	☒	☒	☒	☒	☒	3-14	1900000-011	4	OSCILLOGRAPH CONSOLE
																						☒	☒	☒	☒	☒	1-	1900364-061	3	BLANK PANEL ASSY
	☒	☒	☒			18-	2900023-011			☒	☒	☒	3-17+	1901976-011				☒	☒	3-14✱	1900004-021					☒	3-14	1900004-011	2	OPTICS INERTIAL ANALZER
	☒	☒					2900022-011			☒				1902300-011				☒		15-17	1900005-021					☒	3-14	1900005-011	1	OPTICS INERTIAL TEST SET

1000000	
NEXT ASSY	USED ON
APPLICATION	

Ⓐⓜ THIS SHEET ADDED

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN F.P. Greene DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C. Sarling
NASA APPROVAL
MIT APPROVAL M G Merle, 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 6 OF 7

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRB 21939	8-18-65	
AN	REVISED PER TDRR 23280	10-13-65	
AP	REVISED PER TDRR 23537	10-28-65	

NOTES:

1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB).
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ASCP), 8104002 (RAY), 8106001 (KIC).
3. EFF (S/N) FOLLOWED BY AN ASTERISK (*) ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.

CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N		
																												134	
																												133	
																												132	
																						X	X	X	X	1-36	1022880	131	SCT/SXT LENS COVERS
																					X							130	AOT LENS COVERS
																					X							129	AOT PURGE VALVE COVERS
																						X	X	X	X			128	OUA PURGE VALVE COVERS
																						X	X			1-37	1022970-011	127	CONNECTOR COVERS (OPTICS)
																					X						6014000	126	LEM AOT SHIPPING CONTAINER
																								X	X	1- 3	1019721	125	CASE ASSY, STORAGE MAP & DATA VIEWER
																							X	X	X	1- 5	1019700	124	SHIPPING & STORAGE CONT. OPT UNIT (INTERIM)
																X			9- *	1019720-011				X	X	1-13	1019720	123	OPTICS-NAV BASE SHIPPING CONTAINER
																					X	X	X	X	X	1- 7	1019984-011	122	OPTICS CLEANING KIT
																						X	X			1- 8	1019926-011	121	G & N FIXTURE STAND
																						X	X			1- 7	1019970-011	120	STAR-HORIZON SIMULATOR CERT. FIXT.
																						X	X			1- 8	1019977	119	STAR-HORIZON SIMULATOR
																								X	X	1- 3	1016948	118	TESTER ASSY, MAP & DATA VIEWER
																						X	X	X	X	1- 7	1019840	117	RETROREFLECTING PRISM
																						X	X	X	X	1- 9	1019837	116	PORTABLE LIGHT ASSY
																						X	X	X	X	1- 9	1017376	115	WEDGE, VARIABLE DEVIATION
																						X	X	X	X	1- 5	1019759	114	ADJ MIRROR & PEDESTAL ASSY
																						X	X	X	X	1	1019758	113	TOOLING BAR ASSY
																					X	X	X	X	X	1- 7	1017447	112	THEODOLITE & SUPPORT ASSY
																						X	X	X	X		1021640	111	LIFTING FIXT., G&N INST. QUAL/AZ REF FIXT.
																						X	X	X	X	1- 3	1019760	110	G & N REFERENCE CERTIFICATION FIXT.
																						X	X	X	X	1- 3	1017383	109	G & N INSTALL. QUALIFICATION FIXT.
															X					1017382-011					X	1- 5	1017382	108	AZIMUTH REFERENCE FIXT.
																						X	X	X	X	1-12	1017381	107	45° AUTOCOLLIMATOR PLATE ASSY
																						X	X	X	X	1-22	1017380	106	0° AUTOCOLLIMATOR PLATE ASSY
															X	X	X	X	6-	1017387-011				X	X	1- 5	1017387	105	ALIGNMENT MIRROR CERTIFICATION FIXT
															X	X	X	X	6-	1016951-011				X	X	1- 5	1016951	104	ALIGNMENT MIRROR ASSY
																					X					1-	6014003	103	AOT TESTER
																						X	X	X	X	1- 3	1019769	102	SHAFT ACCURACY TESTER
															X	X	X	X	3-	1016949-011				X	X	1- 2	1016949	101	FUNCTIONAL TESTER ASSY
															X	X				1022942-011*				X	X	1- 3	1022942-000	100	PTF CALIBRATION KIT
																						X	X			1-4	1019962-011	99	AUX PTF STAND
															X	X	X	X	3-	1016910-011				X	X	1-2	1016910	98	PRECISION TEST FIXTURE
																												97	
																												96	
																												95	
																												94	
																												93	
																												92	
																					X	X				1-32	2014013-011	91	AGC UNIV. DSKY HANDLING FIXTURE
																					X	X					1006422	90	AGC UNIV. DSKY SHIPPING CONTAINER
																							X			1-22	1020338	89	AGC MOUNTING KIT
																								X	X	1-22	1020339	88	AGC MOUNTING KIT
																							X	X	X	1-20	1020423	87	CONNECTOR COVERS (AGC)
																							X	X	X	1-20	1006231	86	AGC NAV DSKY SHIPPING CONTAINER
																							X	X	X	1-20	1006229	85	AGC MAIN DSKY SHIPPING CONTAINER
														X	X				21-	1006421			X	X	X	1-20	1006230	84	AGC SHIPPING CONTAINER
																							X	X	X	1-25	1014334	83	AGC NAV DSKY HANDLING FIXTURE
																							X	X	X	1-26	1014377	82	AGC MAIN DSKY HANDLING FIXTURE
							X	X					2014282-011			X	X	X		1020001-003					X	1-22	1020001	81	AGC HANDLING FIXTURE
																									X	1-4	1020225	80	FIXTURE ASSY, ALIGN AGC NAV DSKY
																											1020393	79	INTERCONNECT KIT, P&M
														X	X	X			16-22	2014255-011			X	X	X	3-15	1020313	78	AGC GSE INTERCONNECT KIT, G&N
														X	X	X			10-13	2014268-011			X	X	X	3-9	1020312	77	AGC GSE INTERCONNECT KIT, SUB-SYS
								X	X			1-11	2014014-011			X	X		10-11	1020343					X	1-9	1020195	76	MAIN DSKY MTG STAND
							X	X	X			10-13	2014024-011			X	X		9	1020342					X	1-8	1014465	75	AGC/CTS OPERATION CONSOLE
																					X	X	X			1-9	2014059	74	AUX CALIB SYS CONSOLE
							X	X	X			7-9	2014049-011			X	X	X	1-6 *	1020344-011					X	1-6	1014217	73	COMP CALIB. SYS CONSOLE
							X	X	X			20-26	2014042-011			X	X	X	17-19	1020341					X	3-16	1014156	72	AGC TEST SET
							X	X	X			16-27	2014048-011			X	X	X	12-15	1014061-011					X	3-11	1014061	71	COMP SIMULATOR

NOTES

Ⓐⓜ THIS SHEET ADDED

1000000	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C
NASA APPROVAL
MIT APPROVAL 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE ——
WT
SHEET 7 OF 7

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REVISIONS 00995

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3. REVISED PER TDRR 17228 Cal 3/5/65	4/9/65	
AH	REVISED PER TDRR - 17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	WK
AK	REVISED PER TDRR 18999	5-10-65	
AL	REVISED PER TDRR 19719	5-17-65	WK
AM	REVISED PER TDRR 21939	8-18-65	MGM
AN	REVISED PER TDRR 23280	10-15-65	WK
AP	REVISED PER TDRR 23537	10-25-65	
AR	REVISED PER TDRR 25028	1-4-66	WK

NOTES:

PRE-BASELINE: notes 2–4. POST-BASELINE: notes 6–8.

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓)
6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	PS	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-254		K	1										74	1022942-000	PTF CALIBRATION KIT
				H-23-207	DWG	M						✓				1	73	1021640	LIFTING SLING, G & N INST QUAL. FIXT./AZ REF. FIXT.
				A-23-201		A										1	72	1902431-011	PSA ADAPTER MODULE (CARRY ON)
	1021034			H-23-122	DWG	A			1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	——	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	——	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-250	DWG	A							1		1		67	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
				A-23-251	DWG	A							1	1			66	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
				A 23-114	DWG	A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	——	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	——	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	——	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
																	59		
																	58		
																	57		
				A-23-205	DWG	R						✓					56	1020339	AGC MOUNTING KIT
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	——	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802-011	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB. TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011/021	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	——	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	——	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	——	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005-011	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	——	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	——	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017331	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	——	R		1	1				1				9	1014465	AGC/CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	——	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	——	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	——	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

DOCUMENT NO.	DOCUMENT DESCRIPTION
2900224	PSA ADAPTER MODULE MECH. DIAG. (CARRY ON)
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MISCELLANEOUS DOCUMENTS

MASTER

MASTER

BLOCK I, 0 SERIES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Q. Jones DATE 1965
CHECKED 2/2/65
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 7

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NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC		171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	NEXT ASSY	USED ON
					A-23-254		K		1							76	1022942-000	PTF CALIBRATION KIT		
					H-23-207	DWG	M				✓				1	75	1021640	LIFTING FIXT. G & N INST. QUAL. FIXT./AZ REF. FIXT		
					A-23-201		A								1	74	1902431-011	PSA ADAPTER MODULE (CARRY ON)		
					N.A.	——	A					1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)		
		1021034			H-23-185	DWG	A				✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.		
					A-23-250	DWG	A					1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS		
					A-23-251	DWG	A					1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N		
					A-23-114	DWG	A								1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)		
					S-23-101	1901492-011	A								1	68	1901492-011	AUXILIARY BATTERY PACK		
		1021034			H-23-193		A				✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT		
		1021035		1900005	A-23-198	——	A					1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES		
		1021035		1900005	A-23-167	1900931	A					1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER		
		1021034	1002065		A-23-080	——	A					1		1		64	1900926-011	ROTARY TABLE ASSY		
						DWG	K					1	1	1		63	1022934	CABLE W17		
																62				
																61				
																60				
		1021034			A-23-98	DWG	A				✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET		
		1021035		1900005	A-23-100	——	A					1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET		
		1021034			A-23-105	1900804	A				✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER		
		1021034			A-23-094	1900803	A				✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE		
		1021034			A-23-104	1900802	A				✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS		
		1021034			A-23-099	DWG	A				✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET		
		1021034			A-23-101	1900797	A				✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET		
		1021035		1900005	A-23-108	——	A					1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES		
		1021034			A-23-090	DWG	A					1		1		51	1900606-011	PSA MTG FIXTURE		
		1021034			A-23-107	1900491	A					1				50	1900491-011	REMOTE OPTICS CONTROLLER		
	APT 1900433	1021035		1900005	A-23-102	——	A					1	1	1		49	1900433-011 *	GSE-J BOX OVERHEAD		
		——			A-23-197	DWG	A						1			48	1900364-061	BLANK PANEL ASSY		
		1021034			S-23-100	1900342	A				✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER		
		1021034			A-23-103	1900299	A				✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY		
					A-23-106	1901933	A	PART OF 1901930								45	1901933-011	GSE PSA-J BOX		
		1021035		1900005	C-23-411	——	A					1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE		
		1021034			A-23-093	DWG	A					1	1			43	1900014-011	G&N MTG FIXTURE		
		1021034			A-23-092	DWG	A					1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE		
		1021034			A-23-091	DWG	A					1		1		41	1900012-011	IMU MTG FIXTURE		
		1021034			H-23-123	1900010	A				✓					40	1900010-011	IMU SHIPPING CONTAINER		
		1021034			H-23-122	DWG	A				✓	1	1	1		39	1900009-021	TRANSPORTATION CART G & N ASSY		
		1021035		1900005	N.A.	1900005	A									38	1900005-021	OPTICS INERTIAL TEST SET		
		1021035		1900005	C-23-404	——	A					1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER		
		1021035		1900005	C-23-500	——	A					1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE		
					C-23-425	——	R					1				35	1020393	INTERCONNECT KIT P & M		
					C-23-403	——	R			1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE		
					C-23-501	1020342	R			1		1				33	1020342	AGC/CTS OPERATION CONSOLE		
					C-23-402	——	R			1		1	1			32	1020341	AGC TEST SET		
					A-23-205	——	R			1		1				31	1020339	MOUNTING KIT		
					C-23-424	——	R			1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N		
					C-23-423	——	R			1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS		
		——			A-23-081		R					1	1			28	1020343	MAIN DSKY MTG STAND		
		——			H-23-190		R					1	1			27	1020001-003	AGC HANDLING FIXTURE		
		1021066		1019840	A-23-200	1019840	K					1	1		1	26	1019840	RETRO REFLECTING PRISM		
		1021066			A-23-196	1019837	K		1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.		
		1021066			C-23-593	1019769	K					1	1			24	1019769	SHAFT ACCURACY TESTER		
		1021066			A-23-109	1019759	K					1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.		
		1021066			A-23-199	1019758	K				✓	1	1			22	1019758	TOOLING BAR ASSY		
		1021066		1019721	H-23-197	1019721	K				✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER		
		1021066		1019720	H-23-186	1019720	K				✓					20	1019720-011	OPTICS-NAV BASE, SHIPPING CONTAINER		
		1021066			H-23-199	1019700	K				✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT		
		1021066			A-23-079	1017447	K				✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY		
		1021066		1017383	A-23-097	1017383	K								1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE		
		1021066		1017382	A-23-096	1017382	K								1	16	1017382	AZIMUTH REFERENCE FIXTURE		
		1021066			A-23-111	1017381	K					1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY		
		1021066			A-23-110	1017380	K					2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY		
					A-23-077	1017376	K					1	1			13	1017376	WEDGE VARIABLE DEVIATION		
				1016951	A-23-067	1016951	K					1	1			12	1016951	ALIGNMENT MIRROR ASSY		
		1021068		1016949	C-23-502	1016949	K		1							11	1016949	FUNCTIONAL TESTER ASSY		
		1021071		1016948	C-23-421	1016948	K		1							10	1016948	TESTER ASSY, MAP & DATA VIEWER		
		1021070		1016910	A-23-095	1016910	K		1							9	1016910	PRECISION TEST FIXTURE		
					H-23-198	SCD	M				✓	1	1	1		8	1015462	IMU LIFTING FIXTURE		
					A-23-162	SCD	M								1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.		
					H-23-191	DWG	R			1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE		
					H-23-192	DWG	R			1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE		
					C-23-401	——	R					1		1		4	1014061-011	COMP SIMULATOR		
					H-23-189	SCD	R				✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER		
					H-23-187	SCD	R				✓					2	1006230	AGC SHIPPING CONTAINER		
					H-23-188	SCD	R				✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER	1000000	

DOCUMENTS — QUANTITY REQUIRED — END ITEM — APPLICATION

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR-17571			3-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK
AK		REVISED PER TDRR 18999	F.P.G		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
Ⓝ AP		REVISED PER TDRR 23537	F.P.G.		10-28-65	WK
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900224	MECH. DWG, PSA ADAPTER MODULE (CARRY ON)	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S. S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

(AG) THIS SHEET ADDED

BLOCK I
50 SERIES

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Sperling 3/9/65
APPROVED MIT M.W. Morley 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE ——
SHEET 2 OF 7

NOTICE WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

DOCUMENTS							QUANTITY REQUIRED											END ITEM		
NOTES	MISC	MANUAL	N D	F T M	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-204	1019926	K				1							84	1019926-011	G&N FIXTURE STAND
					A-23-254		K				1							83	1022942-011	PTF CALIBRATION KIT
					A-23-252	1019962	K				1							82	1019962-011	AUX PTF STAND
		ND 1021039			H-23-209	DWG	A						✓					81	1902430-011	COVER SET, ELECTRICAL CONN.
		ND 1021039			H-23-208	DWG	R						✓					80	1020423	CONNECTOR COVERS (AGC)
		ND 1021039			A-23-042		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND 1021039			H-23-206		K						✓					78	TBA	OUA PURGE VALVE COVERS
		ND 1021039			S-23-04		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
		ND 1021039			H-23-194		K						✓				1	76	1022970-011	CONNECTOR COVERS (OPTICS)
		ND 1021039			A-23-166		K						✓				1	75	1022880	OPTICS COVERS
		ND 1021040			A-23-203	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR CERT. FIXTURE
		ND 1021040			A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
		ND 1021039			H-23-185	DWG	A						✓	1	1		1	72	1901846-021	G&N HARNESS HANDL. & SHIPPING FIXTURE
					A-23-250	DWG	A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G&N
		ND 1021039			A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND 1021039			S-23-101	1901492	A										1	68	1901492-021	AUXILIARY BATTERY PACK
		ND 1021039			H-23-193	DWG	A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
					A-23-201		A										1	66	1902431-021	PSA ADAPTER MODULE (CARRY ON)
		ND 1021040			A-23-167	1901981	A							1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND 1021040	1002065		A-23-080	——	A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
																		61		
					H-23-207	DWG	M						✓				1	60	1021640	LIFTING FIXT, G&N INST. QUAL. FIXT./AZ REF. FIXT.
		ND 1021040			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND 1021040			A-23-100	*	A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND 1021040			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND 1021040			A-23-094	DWG	A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND 1021039			A-23-104	1900802	A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		ND 1021040			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND 1021040			A-23-101	1900797-021	A						✓	1	1	1		53	1900797-021/031	LOAD & SIGNAL SIMULATOR SET
		ND 1021040			A-23-108	DWG	A							1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND 1021040			A-23-090	DWG	A							1		1		51	1900806-021	PSA MTG FIXTURE
		ND 1021040			A-23-107	1902046	A							1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND 1021040			A-23-102	1901959	A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
		ND 1021040			A-23-197	DWG.	A								1			48	1900364-061	BLANK PANEL ASSY
		ND 1021039			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND 1021039			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND 1021040			A-23-106	1900268-031	A							1		1		45	1902195-011	GSE/PSA-J BOX
		ND 1021040			C-23-411	*	A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND 1021040			A-23-093	DWG	A							1	1			43	1902204-011	G&N MTG FIXTURE
		ND 1021040			A-23-092	DWG	A							1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND 1021040			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		ND 1021039			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND 1021039			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G&N, ASSY
		ND 1021040		190005-031	NA	1900005-031	A											38	1902300-011	OPTICS INERTIAL TEST SET
		ND 1021040			C-23-404	*	A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND 1021040			C-23-500	*	A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND 1021040			C-23-425	DWG	R							1				35	1020393	INTERCONNECT KIT, P&M
		ND 1021040		1020344	C-23-403	1014217	R					1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE
		ND 1021040		1020342	C-23-501	1020342	R					1		1				33	1020342	AGC/CTS OPERATION CONSOLE
		ND 1021040		1020341	C-23-402	1020341	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R							1				31	1020338	MOUNTING KIT
		ND 1021040			C-23-424	DWG	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G&N
		ND 1021040			C-23-423	DWG	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND 1021040			A-23-081	DWG	R							1	1			28	1020343	MAIN DSKY MTG STAND
		ND 1021039			H-23-190	DWG	R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		ND 1021039			A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND 1021039			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND 1021040			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		ND 1021040			A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND 1021040			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
																		21		
		ND 1021039			H-23-186	1019720	K						✓					20	1019720-011	OPTICS–NAV BASE, SHIPPING CONTAINER
		ND 1021039			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND 1021040			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND 1021039			A-23-097	1017383	K										1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
		ND 1021039			A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND 1021040			A-23-111	1017381	K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-110	1017380	K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-077	1017376	K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND 1021040			A-23-067	1016951	K							1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
		ND 1021040			C-23-502	2010605	K				1							11	1016949-011	FUNCTIONAL TESTER ASSY.
																		10		
		ND 1021040			A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE
		ND 1021040			H-23-198	DWG	M							1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND 1021039			A-23-162	DWG	M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND 1021039			H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND 1021039			H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE		ND 1021040		014061	C-23-401	1014061	R							1		1		4	1014061-011	COMP. SIMULATOR
		ND 1021039			H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND 1021039			H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
		ND 1021039			H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11 P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			3-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.			WK
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
Ⓐ AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	WK
AR		REVISED PER TDRR 25028	J.E.F.		1-4-66	WK

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1022866	DIAG. MECH. AZIMUTH REF. FIXTURE	
2900221	DIAG. MECH. PSA ADAPTER MODULE (CARRY ON)	
ND 1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND 1021041	G&N SYSTEM MANUAL	
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G&N FIXTURE STAND	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

Ⓐ THIS SHEET ADDED

BLOCK I
100 SERIES

LIST OF MATERIALS

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

APPLICATION

NEXT ASSY	USED ON
1000000	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED C. Sorley 3-4-65
APPROVED MIT M. Hurley 3-9-65
APPROVED MSC R. C. 3-4-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE ——
SHEET 3 OF 7

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	JK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	WK
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK

NOTES:

1. 411 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING
2. 421 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING
3. 431 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G&N) TESTING
4. 441 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N)
5. 451 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 461 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS TESTING)
7. 471 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R&I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

NOTES	MISC	MANUAL	N D	MODEL NO.	P S	PC				471	461	451	441	431	421	411	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-256		A							1	1	1		86	2900145-011	PTA/PEA TEST POINT ADAPTER
				A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MTG FIXTURE
				A-23-409		R							1	1	1		84	2014059-011	AGC AUX CALIB. SYS. CONSOLE
						K				1		✓	1	1		1	83		CONNECTOR COVERS, OPTICS
						A							1	1	1		82		CABLE BREAK-OUT BOXES
				S-23-105		A										1	81	2900063-011	LIFTING TEMP. CONTROLLER
																	80		
MECH. DWG G014001						K				1							79	6014003	AOT TESTER
				H-23-205		K						✓					78		AOT PURGE VALVE COVERS
				S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
						A						✓	1	1	1	1	76	6900001-011	CONNECTOR COVERS
				A-23-112		K						✓				1	75		OPTICS COVER, AOT
						R					1	✓	1	1		1	74		CONNECTOR COVERS, LGC SUBSYS.
																	73		
																	72		
																	71		
																	70		
				A-23-114		A										1	69		CABLE, INTERCONNECT
																	68		
																	67		
																	66		
				A-23-67		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
				A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																	63		
																	62		
						A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G&N
				A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
																	58		
				A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
				A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
				A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
																	54		
														1	1		53	6900043-011	CABLE SET, INTERCONNECT
				A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
				A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
				A-23-257		A									1		50	6900007-011	MOUNTING PLATE, COMPONENT
				A-23-102		A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
				A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY
				S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP TEMP CONTROLLER
				A-23-103		A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY
																	45		
				C-23-411		A							1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE
																	43		
																	42		
				A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE
				H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER
				H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART G&N ASSY
				NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
				C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYSER
				C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
						R							1				35	2014064-011	INTERCONNECT KIT, P&M
				C-23-403		R					1		1	1	1		34	2014049-011	COMP CALIB SYS CONSOLE
				C-23-501		R					1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE
				C-23-402		R					1		1	1			32	2014042-011	AGC TEST SET
																	31		
				C-23-424		R					1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G&N
				C-23-423		R					1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS
																	28		
				H-23-190		R						✓					27	2014282-011	AGC HANDLING FIXTURE
																	26		
																	25		
																	24		
																	23		
																	22		
																	21		
																	20		
MECH. DWG G014002				A-23-128		K						✓					19	6014000	LEM AOT SHIPPING CONTAINER
				A-23-079		K						✓					18	1017447	THEODOLITE & SUPPORT ASSY
																	17		
																	16		
																	15		
																	14		
																	13		
																	12		
																	11		
																	10		
																	9		
				H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE
				A-23-162		A										1	7		JUMPER BY-PASS ASSY COOLANT FL.
																	6		
				H-23-192		R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
				C-23-401		R							1		1		4	2014048-011	COMP SIMULATOR
																	3		
				H-23-187		R						✓					2	1006421	AGC SHIPPING CONTAINER
				H-23-188		R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

DOCUMENTS

QUANTITY REQUIRED

END ITEM

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G&N INTERFACE	
2900225	MECH. DIAG., TEST POINT ADAPTER	
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	
6014010	MECH. DWG, LEM AOT PROTECTIVE COVERS	
2900213	MECH. DIAG., GROUNDING	
2900210	MECH. DIAG., AC POWER PROTECTION & POW. DIST.	
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	
2900206	MECH. DIAG., TEST SELECTOR	
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	
2900203	MECH. DIAG., TEMP MONITOR & CONTROL	
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	
2900219	MECH. DIAG., COUNTER SIGNAL SELECTION	
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	
2900215	MECH. DIAG., MEASUREMENT REF. POWER SUPPLIES	
2900212	MECH. DIAG., PIP & IRIG MONITORING	
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	
2900207	MECH. DIAG., MONITOR PANEL	
2900205	MECH. DIAG., PORTABLE TEMP CONTROLLER	
2900201	MECH. DIAG., TEST CONTROL PANEL	
2900200	MECH. DIAG., GYRO CAGING PANEL	

THIS SHEET
ADDED
LEM

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN F. P. Gr[illegible] 5-13-65
CHECKED 5/18/65
APPROVED
APPROVED C. Spading 5/18/65
APPROVED MIT W Kupfer 2 June 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 5 OF 7

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	
AN	REVISED PER TDDR 23280	10-13-65	
AP	REVISED PER TDRR 23537	11-1-65	
AR	REVISED PER TDRR 25028	-6-66	

NOTES:
1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER, AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB)
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ACSP), 8104002 (RAY), 8106001 (KIC)
3. INCORPORATED IN P/N 1901875-011 & 1901876-011
4. EFF (S/N) FOLLOWED BY ✱ ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.
5. P/N 1902299-011 REPLACES P/N 1900740-011 AND P/N 1901308-011.
6. + THREE (3) NEW BUY OIA'S BUILT TO I/O CONFIGURATION AND RETROFITTED IN LINE.

	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N		
	L	2	1	5	0			L	2	1	5	0			L	2	1	5	0			L	2	1	5	0				
																													70	
																													69	
																													68	
																													67	
																													66	
																													65	
																													64	
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																													61	
																													60	
																													59	
																													58	
																													57	
																													56	
																						X					1-	6900043-011	55	CABLE SET, INTERCONNECT
																							X				1-	2900677-011	54	MOUNTING PLATE, COMPONENT
CONFIG V & UP																								X			1-	1902195-011	53	GSE PSA J-BOX
SEE NOTE 3																									X	X		1901663-021	52	PLASTIC TUBING
SEE NOTE 3																									X	X		1900866-021	51	HOSE, COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-021	50	HOSE, COOLANT INTERCONNECT F-F
								X						6900001-011		X					2900065-011			X				1902430	49	CONNECTOR COVERS (ISS)
								X	X	X	X	X		1900009-031			X	X	X	11-	1900009-021					X	2-10	1900009-011	48	TRANSPORTATION CART G & N ASSY
															X	X				15-	1900010-021			X	X	X	1-14	1900010-011	47	IMU SHIPPING CONTAINER
										X	X	X	15-	1901846-031			X	X	X	7-14	1901846-021				X	X	1-6	1901846-011	46	G & N HARNESS HANDL. & SHIPPING FIXT.
																													45	
																						X	X				1-	2900060-011	44	PORTABLE TEMP. CONTROLLER
																						X	X				1-	2900145-011	43	PTA/PEA TEST POINT ADAPTER
																						X	X				1-	2900066-011	42	PTA/PEA MTG FIXTURE
																													41	CABLE BREAK-OUT BOXES
																						X	X				1-	2900070-011	40	FIXTURE, MOUNTING, SUBSYS.
																						X	X				3-	2900024-011	39	GUIDANCE DIST. BOX
																								X	X	X	1-	1901520-011	38	CABLE INTERCONNECT (NAA-P2 TO IMU)
									X	X				1902046-021			X			1-	1902046-011				X	X	2-9	1900491-011	37	REMOTE OPTICS CONTROLLER
																						X	X				1-	2900063-011	36	LIFTING TEMP CONTROLLER
																X	X				1901492-021				X	X	1-	1901492-011	35	AUXILIARY BATTERY PACK
																	X	X	X	15-	1900342-021			X	X	X	2-14	1900342-011	34	INERTIAL COMP TEMP CONTROLLER
SEE ITEM 53 FOR CONT				X		1-2	1901933-011			X		X	3-12 ✱	1900268-031					X	3-12 ✱	1900268-021					X	3-12	1900268-011	33	GSE PSA J-BOX
										X				1900797-031			X		X		1900797-021				X	X	1-	1900797-011	32	LOAD & SIGNAL SIMULATOR SET
															X	X				7-	1900299-021			X	X	X	1- 6	1900299-011	31	DEGAUSSER ASSY
																						X	X	X	X	X	1-	1900804-011	30	IMU PRESSURE SEAL TESTER
															X	X	X	X	X	6-	1902371-011				X	X	1-5	1900803-011	29	FILLING & PURGING FIXT.
																								X	X	X		1015419	28	JUMPER BY-PASS ASSY, COOLANT FL.
																						X	X	X	X	X	1-	1900802-011	27	IMU SNAP-ON BELLOWS
																								X	X	X	1-	1900800-011	26	IMU MTG ALIGN CALIB. TOOL SET
																						X	X	X	X	X	1-	1900810-011	25	ROTARY TABLE CALIB. SET
															X	X	X			12-	1900926-021				X	X	1-11	1900926-011	24	ROTARY TABLE ASSY
																								X	X	X	1-13	1901426-011	23	NAV BASE/OPT ASSY HAND & INST FIXT.
	X						TBA		X					TBA			X				1902431-021				X	X		1902431-011	22	PSA ADAPTER MODULE
																	X	X	X	15-	1900606-021					X	3-14	1900606-011	21	PSA MTG FIXTURE
									X				10-	2900067-011			X	X	X	2-9 ✱	1902204-011					X	2-9	1900014-011	20	G & N MTG FIXTURE
									X				2-9 ✱	2900072-011			X	X	X	2-9 ✱	1902301-011					X	2-9	1900013-011	19	OPTICS/NAV BASE MTG FIXTURE
																								X	X	X	1-	1015462	18	IMU LIFTING FIXTURE
															X	X				1-	2900000-011			X	X	X	3-16	1900012-011	17	IMU MTG FIXTURE
SEE NOTE 3																									X	X		1901663-011	16	TUBING, PLASTIC
SEE NOTE 3																									X	X		1900866-011	15	HOSE COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-011	14	HOSE COOLANT INTERCONNECT, F-F
																								X	X	X		1901876-011	13	HOSE SET, GSE COOLANT INTERCONN, G & N
																								X	X	X		1901875-011	12	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
SEE NOTE 5																									X	X	1-15	1901308-011	11	GSE TO G & N INTERCONNECT CABLES
SEE NOTE 5																									X	X	1-15	1900740-011	10	GSE TO GSE INTERCONNECT CABLES
SEE NOTE 5															X	X				16-	2900025-011			X	X	X	1-15	1902299-011	9	CABLE SET INTERCONNECT
																								X	X	X	3-17	1900805-011	8	PSA TRAY EXTENDER SET
								X	X				18-	2900037-011			X	X	X	15-17	1901981-011					X	2-3,5-14	1900931-011	7	PSA TEST POINT ADAPTER
										X	X	X	15-17	1901959-011				X	X	3-14 ✱	1900433-021					X	3-14	1900433-011	6	GSE J-BOX OVERHEAD
								X					17-	1902134-021			X	X	X	15-16	1902134-011					X	3-14	1900145-011	5	G & N COOLANT & POWER CONSOLE
															X	X	X	X	X	15-	1900000-021	X	X	X	X	X	3-14	1900000-011	4	OSCILLOGRAPH CONSOLE
																						X	X	X	X	X	1-	1900364-061	3	BLANK PANEL ASSY
	X	X	X			18-	2900023-011			X	X	X	3-17+	1901976-011				X	X	3-14 ✱	1900004-021					X	3-14	1900004-011	2	OPTICS INERTIAL ANALZER
	X	X					2900022-011			X				1902300-011				X		15-17	1900005-021					X	3-14	1900005-011	1	OPTICS INERTIAL TEST SET

1000000	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AM
THIS SHEET ADDED

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN F.P. DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C. Sparling
NASA APPROVAL
MIT APPROVAL 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	D	1900030

SCALE — WT SHEET 6 OF 7

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	
AN	REVISED PER TDRR 23280	10-13-65	wk
AP	REVISED PER TDRR 23537	10-28-65	wk
AR	REVISED PER TDRR 25028	1-4-66	wk

NOTES:
1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB).
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ASCP), 8104002 (RAY), 8106001 (KIC).
3. EFF (S/N) FOLLOWED BY AN ASTERISK (*) ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.

NOTES	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N		
																													134	
																													133	
																													132	
																							X	X	X	X	1-36	1022880	131	SCT/SXT LENS COVERS
																						X							130	AOT LENS COVERS
																						X							129	AOT PURGE VALVE COVERS
																							X	X	X	X			128	OUA PURGE VALVE COVERS
																							X	X			1-37	1022970-011	127	CONNECTOR COVERS (OPTICS)
																						X						6014000	126	LEM AOT SHIPPING CONTAINER
																									X	X	1- 3	1019721	125	CASE ASSY, STORAGE MAP & DATA VIEWER
																								X	X	X	1- 5	1019700	124	SHIPPING & STORAGE CONT. OPT UNIT (INTERIM)
																X				9- *	1019720-011				X	X	1-13	1019720	123	OPTICS-NAV BASE SHIPPING CONTAINER
																						X	X	X	X	X	1- 7	1019984-011	122	OPTICS CLEANING KIT
																							X	X			1- 8	1019926-011	121	G & N FIXTURE STAND
																							X	X			1- 7	1019970-011	120	STAR-HORIZON SIMULATOR CERT. FIXT.
																							X	X			1- 8	1019977	119	STAR-HORIZON SIMULATOR
																									X	X	1- 3	1016948	118	TESTER ASSY, MAP & DATA VIEWER
																							X	X	X	X	1- 7	1019840	117	RETROREFLECTING PRISM
																							X	X	X	X	1- 9	1019837	116	PORTABLE LIGHT ASSY
																							X	X	X	X	1- 9	1017376	115	WEDGE, VARIABLE DEVIATION
																							X	X	X	X	1- 5	1019759	114	ADJ MIRROR & PEDESTAL ASSY
																							X	X	X	X	1	1019758	113	TOOLING BAR ASSY
																						X	X	X	X	X	1- 7	1017447	112	THEODOLITE & SUPPORT ASSY
																							X	X	X	X		1021640	111	LIFTING FIXT., G & N INST. QUAL/AZ REF FIXT.
																							X	X	X	X	1- 3	1019760	110	G & N REFERENCE CERTIFICATION FIXT.
																							X	X	X	X	1- 3	1017383	109	G & N INSTALL. QUALIFICATION FIXT.
															X						1017382-011					X	1- 5	1017382	108	AZIMUTH REFERENCE FIXT.
																							X	X	X	X	1-12	1017381	107	45° AUTOCOLLIMATOR PLATE ASSY
																							X	X	X	X	1-22	1017380	106	0° AUTOCOLLIMATOR PLATE ASSY
															X	X	X	X		6-	1017387-011				X	X	1- 5	1017387	105	ALIGNMENT MIRROR CERTIFICATION FIXT
															X	X	X	X		6-	1016951-011				X	X	1- 5	1016951	104	ALIGNMENT MIRROR ASSY
																						X					1-	6014003	103	AOT TESTER
																							X	X	X	X	1- 3	1019769	102	SHAFT ACCURACY TESTER
															X	X	X	X		3-	1016949-011				X	X	1- 2	1016949	101	FUNCTIONAL TESTER ASSY
															X	X					1022942-011*				X	X	1- 3	1022942-000	100	PTF CALIBRATION KIT
																							X	X			1- 4	1019962-011	99	AUX PTF STAND
															X	X	X	X		3-	1016910-011				X	X	1-2	1016910	98	PRECISION TEST FIXTURE
																													97	
																													96	
																													95	
																													94	
																													93	
																													92	
																						X	X				1-32	2014013-011	91	AGC UNIV. DSKY HANDLING FIXTURE
																						X	X					1006422	90	AGC UNIV. DSKY SHIPPING CONTAINER
																								X			1-22	1020338	89	AGC MOUNTING KIT
																									X	X	1-22	1020339	88	AGC MOUNTING KIT
																								X	X	X	1-20	1020423	87	CONNECTOR COVERS (AGC)
																								X	X	X	1-20	1006231	86	AGC NAV DSKY SHIPPING CONTAINER
																								X	X	X	1-20	1006229	85	AGC MAIN DSKY SHIPPING CONTAINER
															X	X				21-	1006421			X	X	X	1-20	1006230	84	AGC SHIPPING CONTAINER
																								X	X	X	1-25	1014334	83	AGC NAV DSKY HANDLING FIXTURE
																								X	X	X	1-26	1014377	82	AGC MAIN DSKY HANDLING FIXTURE
								X	X					2014282-011			X	X	X		1020001-003					X	1-22	1020001	81	AGC HANDLING FIXTURE
																										X	1-4	1020225	80	FIXTURE ASSY, ALIGN AGC NAV DSKY
																												1020393	79	INTERCONNECT KIT, P & M
															X	X	X			16-22	2014255-011			X	X	X	3-15	1020313	78	AGC GSE INTERCONNECT KIT, G & N
															X	X	X			10-13	2014268-011			X	X	X	3-9	1020312	77	AGC GSE INTERCONNECT KIT, SUB-SYS
									X	X			1-11	2014014-011			X	X		10-11	1020343					X	1-9	1020195	76	MAIN DSKY MTG STAND
								X	X	X			10-13	2014024-011			X	X		9	1020342					X	1-8	1014465	75	AGC/CTS OPERATION CONSOLE
																						X	X	X			1-9	2014059	74	AUX CALIB SYS CONSOLE
								X	X	X			7-9	2014049-011			X	X	X	1-6 *	1020344-011					X	1-6	1014217	73	COMP CALIB. SYS CONSOLE
								X	X	X			20-26	2014042-011			X	X	X	17-19	1020341					X	3-16	1014156	72	AGC TEST SET
								X	X	X			16-27	2014048-011			X	X	X	12-15	1014061-011					X	3-11	1014061	71	COMP SIMULATOR

(AM)
THIS
SHEET
ADDED

NEXT ASSY	USED ON
1000000	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO CONTRACT
DRAWN F.P. Bosco DATE 8-12-65
CHECKED Stuttle 8-24-65
APPROVAL
APPROVAL C Spooling
NASA APPROVAL
MIT APPROVAL M C Mead, 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 7 OF 7

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REVISIONS 00995

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3, REVISED PER TDRR 17228 Cag 2/5/65	4/1/65	
AH	REVISED PER TDRR-17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	WK
AK	REVISED PER TDRR 18999	5-10-65	
AL	REVISED PER TDRR 19719	5-17-65	WK
AM	REVISED PER TDRR 21939	8-18-65	MGM
AN	REVISED PER TDRR 23280	10-15-65	WK
AP	REVISED PER TDRR 23537	10-28-65	
AR	REVISED PER TDRR 25028	1-4-66	WK
AS	REVISED PER TDRR 25330	1-17-66	WK

NOTES:

PRE-BASELINE

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓).

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.
9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

MISC	CMRM	ND	FTM	MODEL NO.	PS	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-254		K	1										74	1022942-000	PTF CALIBRATION KIT
				H-23-207	DWG	M						✓				1	73	1021640	LIFTING SLING, G & N INST QUAL. FIXT./AZ REF. FIXT.
				A-23-201		A										1	72	1902431-011	PSA ADAPTER MODULE (CARRY ON)
	1021034			H-23-122	DWG	A			1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	——	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	——	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-250	DWG	A							1		1		67	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
				A-23-251	DWG	A							1	1			66	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-114	DWG	A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	——	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	——	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	——	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
																	59		
																	58		
																	57		
				A-23-205	DWG	R						✓					56	1020339	AGC MOUNTING KIT
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	——	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802-011	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB. TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011/021	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	——	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	——	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	——			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	——	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005-011	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	——	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	——	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	——			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	——			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	O° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	——	R		1	1				1				9	1014465	AGC/CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	——	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	——	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	——	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER
DOCUMENTS						QUANTITY REQUIRED											END ITEM		

DOCUMENT NO.	DOCUMENT DESCRIPTION
2900224	PSA ADAPTER MODULE MECH. DIAG. (CARRY ON)
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH. DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MISCELLANEOUS DOCUMENTS

MASTER

MASTER

BLOCK I, O SERIES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±— DECIMALS ±— ANGLES ±—
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN R. G. Jones DATE 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C. Dooley 2/2/65
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 7

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NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC		171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-254		K		1							76	1022942-000	PTF CALIBRATION KIT
					H-23-207	DWG	M				✓				1	75	1021640	LIFTING FIXT. G & N INST. QUAL. FIXT./AZ REF. FIXT
					A-23-201		A								1	74	1902431-011	PSA ADAPTER MODULE (CARRY ON)
					N.A.	——	A					1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A				✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.
					A-23-250	DWG	A					1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A					1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-114	DWG	A								1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A								1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A				✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198	——	A					1	1	1		66	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A					1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080	——	A					1		1		64	1900926-011	ROTARY TABLE ASSY
						DWG	K					1	1	1		63	1022934	CABLE W17
																62		
																61		
																60		
		1021034			A-23-98	DWG	A				✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100	——	A					1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A				✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A				✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A				✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A				✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A				✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108	——	A					1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A					1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A					1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900C05	A-23-102	——	A					1	1	1		49	1900433-011 *	GSE-J BOX OVERHEAD
		——			A-23-197	DWG	A						1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A				✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A				✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901333	A	PART OF 1901930								45	1901333-011	GSE PSA-J BOX
		1021035		1900005	C-23-411	——	A					1	1	1		44	1900145-011 *	G & N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A					1	1			43	1900014-011	G & N MTG FIXTURE
		1021034			A-23-092	DWG	A					1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-031	DWG	A					1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A				✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A				✓	1	1	1		39	1900009-021	TRANSPORTATION CART G & N ASSY
		1021035		1900005	N.A.	1900005	A									38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404	——	A					1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500	——	A					1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					C-23-425	——	R					1				35	1020393	INTERCONNECT KIT F & M
					C-23-403	——	R			1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE
					C-23-501	1020342	R			1		1				33	1020342	AGC/CTS OPERATION CONSOLE
					C-23-402	——	R			1		1	1			32	1020341	AGC TEST SET
					A-23-205	——	R			1		1				31	1020339	MOUNTING KIT
					C-23-424	——	R			1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					C-23-423	——	R			1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		——			A-23-081		R					1	1			28	1020343	MAIN DSKY MTG STAND
		——			H-23-190		R					1	1			27	1020001-003	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K					1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K		1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K					1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K					1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K				✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K				✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K				✓					20	1019720-011	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K				✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K				✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K								1	17	1017383	G & N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K								1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K					1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K					2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K					1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K					1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K		1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K		1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K		1							9	1016910	PRECISION TEST FIXTURE
					H-23-98	SCD	M				✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M								1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R			1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R			1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	——	R					1		1		4	1014061-011	COMP SIMULATOR
					H-23-183	SCD	R				✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R				✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R				✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER
NOTES	DOCUMENTS						QUANTITY REQUIRED									END ITEM		

NEXT ASSY	USED ON
1000000	

APPLICATION

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17226	RJ			
AH		REVISED PER TDRR -17571			8-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK
AK		REVISED PER TDRR 18999	F.P.G		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
Ⓜ AP		REVISED PER TDRR 23537	F.P.G.		10-28-65	WK
Ⓜ AR		REVISED PER TDRR 25028	JEF		1-4-66	WK
AS		REVISED PER TDRR 25330	JEF		1-17-66	WK

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900224	MECH DWG, PSA ADAPTER MODULE (CARRY ON)	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S. S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

(AG) THIS SHEET ADDED

BLOCK I
50 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED 3/9/65
APPROVED MIT 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE ——
SHEET 2 OF 7

8 7 6 5 4 3 2 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	DOCUMENTS						PC	QUANTITY REQUIRED										END ITEM		
	MISC	MANUAL	ND	FTM	MODEL NO.	PS					271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-204	1019926	K				1							84	1019926-011	G&N FIXTURE STAND
					A-23-254		K				1							83	1022942-011	PTF CALIBRATION KIT
					A-23-252	1019962	K				1							82	1019962-011	AUX PTF STAND
		ND 1021039			H-23-209	DWG	A						✓					81	1902430-011	COVER SET, ELECTRICAL CONN.
		ND 1021039			H-23-208	DWG	R						✓					80	1020423	CONNECTOR COVERS (AGC)
		ND 1021039			A-23-042		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND 1021039			H-23-206		K						✓					78	TBA	OUA PURGE VALVE COVERS
		ND 1021039			S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
		ND 1021039			H-23-194		K						✓				1	76	1022970-011	CONNECTOR COVERS (OPTICS)
		ND 1021039			A-23-166		K						✓				1	75	1022880	OPTICS COVERS
		ND 1021040			A-23-203	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR CERT. FIXTURE
		ND 1021040			A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
		ND 1021039			H-23-185	DWG	A						✓	1	1		1	72	1901646-021	G&N HARNESS HANDL. & SHIPPING FIXTURE
					A-23-250	DWG	A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G&N
		ND 1021039			A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND 1021039			S-23-101	1901492	A										1	68	1901492-021	AUXILIARY BATTERY PACK
		ND 1021039			H-23-193	DWG	A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
					A-23-201		A										1	66	1902431-021	PSA ADAPTER MODULE (CARRY ON)
		ND 1021040			A-23-197	1901981	A							1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND 1021040	1002065		A-23-080	——	A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
																		61		
					H-23-207	DWG	M						✓				1	60	1021640	LIFTING FIXT, G&N INST. QUAL. FIXT./AZ REF. FIXT.
		ND 1021040			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND 1021040			A-23-100	*	A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND 1021040			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND 1021040			A-23-094	DWG	A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND 1021039			A-23-104	1900802	A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		ND 1021040			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND 1021040			A-23-101	1900797/021	A						✓	1	1	1		53	1900797-021/031	LOAD & SIGNAL SIMULATOR SET
		ND 1021040			A-23-108	DWG	A							1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND 1021040			A-23-090	DWG	A							1		1		51	1900606-021	PSA MTG FIXTURE
		ND 1021040			A-23-107	1902046	A							1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND 1021040			A-23-102	1901959	A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
		ND 1021040			A-23-197	DWG.	A								1			48	1900364-061	BLANK PANEL ASSY
		ND 1021039			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND 1021039			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND 1021040			A-23-106	1900268-031	A							1		1		45	1902195-011	GSE/PSA-J BOX
		ND 1021040			C-23-411	*	A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND 1021040			A-23-093	DWG	A							1	1			43	1902204-011	G&N MTG FIXTURE
		ND 1021040			A-23-092	DWG	A							1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND 1021040			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		ND 1021039			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND 1021039			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G&N, ASSY
		ND 1021040		190005-031	NA	1900005-031	A											38	1902300-011	OPTICS INERTIAL TEST SET
		ND 1021040			C-23-404	*	A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND 1021040			C-23-500	*	A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND 1021040			C-23-425	DWG	R							1				35	1020393	INTERCONNECT KIT, P&M
		ND 1021040		1020344	C-23-403	1014217	R					1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE
		ND 1021040		1020342	C-23-501	1020342	R					1		1				33	1020342	AGC/CTS OPERATION CONSOLE
		ND 1021040		1020341	C-23-402	1020341	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R							1				31	1020338	MOUNTING KIT
		ND 1021040			C-23-424	DWG	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G&N
		ND 1021040			C-23-423	DWG	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND 1021040			A-23-081	DWG	R							1	1			28	1020343	MAIN DSKY MTG STAND
		ND 1021039			H-23-190	DWG	R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		ND 1021039			A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND 1021039			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND 1021040			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		ND 1021040			A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND 1021040			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
																		21		
		ND 1021039			H-23-186	1019720	K						✓					20	1019720-011	OPTICS-NAV BASE, SHIPPING CONTAINER
		ND 1021039			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND 1021040			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND 1021039			A-23-097	1017383	K										1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
		ND 1021039			A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND 1021040			A-23-111	1017381	K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-110	1017380	K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-077	1017376	K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND 1021040			A-23-067	1016951	K							1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
		ND 1021040			C-23-502	2010605	K				1							11	1016949-011	FUNCTIONAL TESTER ASSY.
																		10		
		ND 1021040			A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE
		ND 1021040			H-23-198	DWG	M							1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND 1021039			A-23-162	DWG	M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND 1021039			H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND 1021039			H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11		ND 1021040		014061	C-23-401	1014061	R							1		1		4	1014061-011	COMP. SIMULATOR
		ND 1021039			H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND 1021039			H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
		ND 1021039			H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES:

1-271 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11 P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			8-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.			WK
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	WK
AR		REVISED PER TDRR 25028	J.E.F.		1-4-66	WK
AS		REVISED PER TDRR 25330	J.E.F.		1-17-66	WK

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1022866	DIAG. MECH. AZIMUTH REF. FIXTURE	
2900221	DIAG. MECH. PSA ADAPTER MODULE (CARRY ON)	
ND 1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND 1021041	G&N SYSTEM MANUAL	
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G & N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I

100 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 2/25/65
CHECKED
APPROVED
APPROVED 3/4/65
APPROVED MIT 3-9-65
APPROVED MSC 3-4-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE ——
SHEET 3 OF 7

8 7 6 5 4 3 2 1

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	DOCUMENTS						QUANTITY REQUIRED											END ITEM			APPLICATION	
	MISC	CMRM	N D		MODEL NO.	P S	P C				371	361	351	341	331	321	311	ITEM NO.	PART NO. IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	NEXT ASSY	USED ON
					A-23-256		A									1		88	2900145-011	PTA/PEA TEST POINT ADAPTER		
							A											87		CABLE BREAK-OUT BOXES		
SEE NOTE 11					C-23-409	2014059	R							1	1	1		86	2014059-011	AUX CALIB SYS CONSOLE		
					A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MOUNTING FIXTURE		
					S-23-105	2900063	A						✓				1	84	2900063-011	LIFTING TEMP CONTROLLER		
MECH DWG 1022868					H-23-194		K						✓				1	83	1022970-011	CONNECTOR COVERS (OPTICS)		
					H-23-208	DWG	R						✓				1	82		CONNECTOR COVERS (AGC)		
					H-23-209		A						✓				1	81	2900065-011	CONNECTOR COVERS (ISS)		
MECH DWG 1019899					A-23-204	1019926	K				1							80	1019926-011	GEN FIXTURE STAND		
																		79				
					H-23-206		K						✓					78		DUA PURGE VALVE COVERS		
MECH DWG 1022864	& 1022870				S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT		
					A-23-254		K				1							76	1022942	PTF CALIBRATION KIT		
MECH DWG 1022865					A-23-166		K						✓				1	75	1022880	OPTICS COVERS		
MECH DWG 1019883					A-23-203	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR CERT FIXTURE		
MECH DWG 1019901					A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR		
																		72				
																		71				
																		70				
					A-23-114		A										1	69		CABLE, INTERCONNECT (NAA-P2 TO IMU)		
																		68				
																		67				
					A-23-258		A									1		66	2900277-011	MOUNTING PLATE, COMPONENT		
					A-23-167		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER		
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY		
																		63				
																		62				
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS		
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N		
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET		
																		58				
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER		
					A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE		
					A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS		
							A											54				
																		53				
					A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT		
					A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.		
					A-23-107	1902046	A							1				50	1902046-021	REMOTE OPTICS CONTROLLER		
					A-23-192	2900024	A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX		
					A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY.		
					S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP. TEMP. CONTROLLER		
					A-23-103	2010602	A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY.		
					H-23-207		M						✓				1	45	1021640	LIFTING SLING, G & N INST. QUAL. FIXT./AZ REF. FIXT.		
					C-23-411		A							1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE		
					A-23-093		A							1	1			43	2900067-011	G&N MTG FIXTURE		
					A-23-092		A							1	1			42	2900012-011	OPTICS MTG FIXTURE		
					A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE		
					H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER		
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G&N, ASSY.		
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET		
					C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYZER		
1900000-011 USABLE					C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE		
					C-23-425	DWG	R							1				35		INTERCONNECT KIT, P & M		
SEE NOTE 11					C-23-403	2014049	R					1	✓					34	2014049-011	COMP CALIB SYS CONSOLE		
					C-23-501	TBA	R					1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE		
					C-23-402	TBA	R					1		1	1			32	2014042-011	AGC TEST SET		
																		31				
					C-23-424	TBA	R					1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G&N		
					C-23-423	DWG	R					1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS.		
					A-23-081		R							1	1			28	2014014-011	DSKY MTG STAND		
					H-23-190	DWG	R						✓	1	1			27	2014282-011	AGC HANDLING FIXTURE		
					A-23-200		K							1	1		1	26	1019840	RETRO REFLECTING PRISM		
					A-23-196		K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY		
					C-23-593		K							1	1			24	1019769	SHAFT ACCURACY TESTER		
					A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY		
					A-23-199		K						✓	1	1			22	1019758	TOOLING BAR ASSY.		
					A-23-252	1019962	K				1							21	1019962-011	AUX PTF STAND		
MECH. DWG 1022903																		20				
					H-23-199		K						✓					19		SHIPPING & STORAGE CONTAINER, OPT UNIT		
					A-23-079		K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.		
					A-23-097		K										1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE		
MECH DWG 1022866	& 1022902				A-23-096		K										1	16		AZIMUTH REFERENCE FIXTURE		
					A-23-111		K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY.		
					A-23-110		K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY.		
					A-23-077		K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION		
					A-23-067		K							1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.		
MECH DWG 1019890					C-23-502	2010605	K				1							11	1016949-011	FUNCTIONAL TESTER ASSY.		
																		10				
					A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE		
					H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE		
					A-23-162		A										1	7	1021646	JUMPER BY-PASS ASSY, COOLANT FL.		
																		6				
					H-23-192	DWG	R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE		
					C-23-401	2014048	R							1		1		4	2014048-011	COMP. SIMULATOR		
																		3				
					H-23-187	SCD	R						✓					2	1006421	AGC SHIPPING CONTAINER		
					H-23-188	SCD	R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER	1000000	

NOTES

1. 311 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 321 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 331 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 341 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/ OSS/ G&N/ CSS).
5. 351 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 361 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
7. 371 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.
11. CALIB. SYS CONSOLE CAN BE USED IN LIEU OF AUX. CALIB. SYS CONSOLE.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
AP		REVISED PER TDRR 23537	F.P.G.		11--65	WK
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK
AS		REVISED PER TDRR 25330	JEF		1-17-66	WK

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	II, LEM
2900225	MECH. DIAG., TEST POINT ADAPTER	II, LEM
2014022	MECH. DIAG., AGC TEST SET	I, II, LEM
2014021	MECH. DIAG., AGC SIMULATOR	I, II, LEM
2014020	MECH. DIAG., AGC/CTS OPER. CONSOLE	I, II, LEM
2014019	MECH. DIAG., AUX. CALIB. SYS. CONSOLE	I, II, LEM
2014018	MECH. DIAG., AGC CALIB. SYS. CONSOLE	I, II, LEM
2900224	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/0, I/50
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	I/100, II, LEM
2900221	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/100
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	II, LEM
2900216	MECH. DIAG., OPTICS CONTROL	I/100, II
2900214	MECH. DIAG., GROUNDING	I/100, II
2900213	MECH. DIAG., GROUNDING	II, LEM
2900210	MECH. DIAG., AC POWER PROTECTION & POWER DIST.	I/100, II, LEM
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	I/100, II, LEM
2900206	MECH. DIAG., TEST SELECTOR	I/100, II, LEM
2900202	MECH. DIAG., TEST CONTROL	I/100, II
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900204	MECH. DIAG., TEMP MONITOR & CONTROL	FOR I/100 TESTING ONLY
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	I/100, II, LEM
2900203	MECH. DIAG., TEMP MONITOR & CONTROL PANEL	II, LEM
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	I/100, II, LEM
2900219	MECH. DIAG., COUNTER SIGNAL COLLECTION	I/100, II, LEM
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	I/100, II, LEM
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	I/100, II, LEM
2900215	MECH. DIAG., MEASUREMENTS REF. POWER SUPPLIES	I/100, II, LEM
2900212	MECH. DIAG., PIP & IRIG MONITORING	I/100, II, LEM
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	I/100, II, LEM
2900205	MECH. DIAG., PORT TEMP CONTROLLER	I/100, II, LEM
2900207	MECH. DIAG., MONITOR PANEL	I/100, II, LEM
2900201	MECH. DIAG., TEST CONTROL PANEL	II, LEM
2900200	MECH. DIAG., GYRO CAGING PANEL	I/100, II, LEM

MISCELLANEOUS DOCUMENTS

THIS SHEET ADDED

BLOCK II

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R.A. Jones 3-19-65
CHECKED 5/18/65
APPROVED
APPROVED C. Sparling 5/18/65
APPROVED MIT
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 4 OF 7

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					A-23-256		A							1	1	1		86	2900145-011	PTA/PEA TEST POINT ADAPTER
					A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MTG FIXTURE
					A-23-409		R							1	1	1		84	2014059-011	AGC AUX CALIB. SYS. CONSOLE
							K				1		✓	1	1		1	83		CONNECTOR COVERS, OPTICS
							A							1	1	1		82		CABLE BREAK-OUT BOXES
					S-23-105		A										1	81	2900063-011	LIFTING TEMP. CONTROLLER
																		80		
MECH. DWG 6014001							K				1							79	6014003	AOT TESTER
					H-23-205		K						✓					78		AOT PURGE VALVE COVERS
					S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
							A						✓	1	1	1	1	76	6900001-011	CONNECTOR COVERS
					A-23-112		K						✓				1	75		OPTICS COVER, AOT
							R					1	✓	1	1		1	74		CONNECTOR COVERS, LGC SUBSYS.
																		73		
																		72		
																		71		
																		70		
					A-23-114		A											69		CABLE, INTERCONNECT
																		68		
																		67		
																		66		
					A-23-167		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET
																		58		
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
																		54		
															1	1		53	6900043-011	CABLE SET INTERCONNECT
					A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
					A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
					A-23-257		A									1		50	6900007-011	MOUNTING PLATE, COMPONENT
					A-23-102		A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
					A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY
					S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP TEMP CONTROLLER
					A-23-103		A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY
																		45		
					C-23-411		A							1	1	1		44	1902134-021*	G & N COOLANT & POWER CONSOLE
																		43		
																		42		
					A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART G & N ASSY
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYSER
					C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
							R							1				35	2014064-011	INTERCONNECT KIT, P & M
					C-23-403		R					1		1	1	1		34	2014049-011	COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32	2014042-011	AGC TEST SET
																		31		
					C-23-424		R					1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G & N
					C-23-423		R					1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS
																		28		
					H-23-190		R						✓					27	2014282-011	AGC HANDLING FIXTURE
																		26		
																		25		
																		24		
																		23		
																		22		
																		21		
																		20		
MECH. DWG 6014002					A-23-128		K						✓					19	6014000	LEM AOT SHIPPING CONTAINER
					A-23-079		K						✓					18	1017447	THEODOLITE & SUPPORT ASSY
																		17		
																		16		
																		15		
																		14		
																		13		
																		12		
																		11		
																		10		
																		9		
					H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE
					A-23-162		A										1	7		JUMPER BY-PASS ASSY COOLANT FL.
																		6		
					H-23-192		R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
					C-23-401		R							1		1		4	2014048-011	COMP SIMULATOR
																		3		
					H-23-187		R						✓					2	1006421	AGC SHIPPING CONTAINER
					H-23-188		R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER
NOTES	MISC	MANUAL	N D		MODEL NO.	P S	PC				471	461	451	441	431	421	411	ITEM NO	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		

NOTES:

1. 411 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING
2. 421 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING
3. 431 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING
4. 441 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N)
5. 451 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 461 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS TESTING)
7. 471 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	JK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	WK
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK
AS		REVISED PER TDRR 25330	JEF		1-17-66	WK

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021591	CTS-G & N INTERFACE	
2900225	MECH. DIAG., TEST POINT ADAPTER	
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	
6014010	MECH. DWG, LEM AOT PROTECTIVE COVERS	
2900213	MECH. DIAG., GROUNDING	
2900210	MECH. DIAG., AC POWER PROTECTION & POW. DIST.	
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	
2900206	MECH. DIAG., TEST SELECTOR	
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	
2900203	MECH. DIAG., TEMP MONITOR & CONTROL	
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	
2900219	MECH. DIAG., COUNTER SIGNAL SELECTION	
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	
2900215	MECH. DIAG., MEASUREMENT REF. POWER SUPPLIES	
2900212	MECH. DIAG., PIP & IRIG MONITORING	
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	
2900207	MECH. DIAG., MONITOR PANEL	
2900205	MECH. DIAG., PORTABLE TEMP CONTROLLER	
2900201	MECH. DIAG., TEST CONTROL PANEL	
2900200	MECH. DIAG., GYRO CAGING PANEL	
MISCELLANEOUS DOCUMENTS		

THIS SHEET
ADDED
LEM

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON
1000000	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN F.P. 5-13-65
CHECKED 5/18/65
APPROVED
APPROVED C Sparling 5/18/65
APPROVED MIT W Kupfer 2 June 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 5 OF 7

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	WW
AN	REVISED PER TDDR 23280	10-13-65	WK
AP	REVISED PER TDRR 23537	11-1-65	WK
AR	REVISED PER TDRR 25028	-4-66	WK
AS	REVISED PER TDRR 25330	- -66	WK

NOTES:

1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER, AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB)
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ACSP), 8104002 (RAY), 8106001 (KIC)
3. INCORPORATED IN P/N 1901875-011 & 1901876-011
4. EFF (S/N) FOLLOWED BY * ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.
5. P/N 1902299-011 REPLACES P/N 1900740-011 AND P/N 1901308-011.
6. + THREE (3) NEW BUY 01A'S BUILT TO I/O CONFIGURATION AND RETROFITTED IN LINE.

	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I								
	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	CAPABILITY L	2	1	5	0	EFF. S/N	END ITEM P/N	ITEM	NOMENCLATURE OR DESCRIPTION
																													70	
																													69	
																													68	
																													67	
																													66	
																													65	
																													64	
																													63	
																													62	
																													61	
																													60	
																													59	
																													58	
																													57	
																													56	
																						X					1-	6900043-011	55	CABLE SET, INTERCONNECT
																							X				1-	2900677-011	54	MOUNTING PLATE, COMPONENT
CONFIG V & UP																								X			1-	1902195-011	53	GSE PSA J-BOX
SEE NOTE 3																									X	X		1901663-021	52	PLASTIC TUBING
SEE NOTE 3																									X	X		1900866-021	51	HOSE, COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-021	50	HOSE, COOLANT INTERCONNECT F-F
								X						6900001-011		X					2900065-011			X				1902430	49	CONNECTOR COVERS (ISS)
								X	X	X	X	X		1900009-031			X	X	X	11-	1900009-021					X	2-10	1900009-011	48	TRANSPORTATION CART G & N ASSY
															X	X				15-	1900010-021			X	X	X	1-14	1900010-011	47	IMU SHIPPING CONTAINER
										X	X	X	15-	1901846-031			X	X	X	7-14	1901846-021				X	X	1-6	1901846-011	46	G & N HARNESS HANDL. & SHIPPING FIXT.
																													45	
																						X	X				1-	2900060-011	44	PORTABLE TEMP. CONTROLLER
																						X	X				1-	2900145-011	43	PTA/PEA TEST POINT ADAPTER
																						X	X				1-	2900066-011	42	PTA/PEA MTG FIXTURE
																													41	CABLE BREAK-OUT BOXES
																						X	X				1-	2900070-011	40	FIXTURE, MOUNTING, SUBSYS.
																						X	X				3-	2900024-011	39	GUIDANCE DIST. BOX
																								X	X	X	1-	1901520-011	38	CABLE INTERCONNECT (NAA-P2 TO IMU)
									X	X				1902046-021			X			1-	1902046-011				X	X	2-9	1900491-011	37	REMOTE OPTICS CONTROLLER
																						X	X				1-	2900063-011	36	LIFTING TEMP CONTROLLER
																X	X				1901492-021				X	X	1-	1901492-011	35	AUXILIARY BATTERY PACK
																	X	X	X	15-	1900342-021			X	X	X	2-14	1900342-011	34	INERTIAL COMP TEMP CONTROLLER
SEE ITEM 53 FOR CONT				X		1-2	1901933-011			X		X	3-12 *	1900268-031					X	3-12 *	1900268-021					X	3-12	1900268-011	33	GSE PSA J-BOX
										X				1900797-031			X		X		1900797-021				X	X	1-	1900797-011	32	LOAD & SIGNAL SIMULATOR SET
															X	X				7-	1900299-021			X	X	X	1-6	1900299-011	31	DEGAUSSER ASSY
																						X	X	X	X	X	1-	1900804-011	30	IMU PRESSURE SEAL TESTER
															X	X	X	X	X	6-	1902371-011				X	X	1-5	1900803-011	29	FILLING & PURGING FIXT.
																								X	X	X		1015419	28	JUMPER BY-PASS ASSY, COOLANT FL.
																						X	X	X	X	X	1-	1900802-011	27	IMU SNAP-ON BELLOWS
																									X	X	1-	1900800-011	26	IMU MTG ALIGN CALIB. TOOL SET
																						X	X	X	X	X	1-	1900810-011	25	ROTARY TABLE CALIB. SET
															X	X	X			12-	1900926-021				X	X	1-11	1900926-011	24	ROTARY TABLE ASSY
																								X	X	X	1-13	1901426-011	23	NAV BASE/OPT ASSY HAND & INST FIXT.
							TBA		X					TBA			X				1902431-021				X	X		1902431-011	22	PSA ADAPTER MODULE
																	X	X	X	15-	1900606-021					X	3-14	1900606-011	21	PSA MTG FIXTURE
									X				10-	2900067-011			X	X	X	2-9 *	1902204-011					X	2-9	1900014-011	20	G & N MTG FIXTURE
									X				2-9 *	2900072-011			X	X	X	2-9 *	1902301-011				X	X	2-9	1900013-011	19	OPTICS/NAV BASE MTG FIXTURE
																								X	X	X	1-	1015462	18	IMU LIFTING FIXTURE
															X	X				1-	2900000-011			X	X	X	3-16	1900012-011	17	IMU MTG FIXTURE
SEE NOTE 3																									X	X		1901663-011	16	TUBING, PLASTIC
SEE NOTE 3																									X	X		1900866-011	15	HOSE COOLANT INTERCONNECT M-F
SEE NOTE 3																									X	X		1900867-011	14	HOSE COOLANT INTERCONNECT, F-F
																								X	X	X		1901876-011	13	HOSE SET, GSE COOLANT INTERCONN, G & N
																								X	X	X		1901875-011	12	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
SEE NOTE 5																									X	X	1-15	1901308-011	11	GSE TO G & N INTERCONNECT CABLES
SEE NOTE 5																									X	X	1-15	1900740-011	10	GSE TO GSE INTERCONNECT CABLES
SEE NOTE 5															X	X				16-	2900025-011			X	X	X	1-15	1902299-011	9	CABLE SET INTERCONNECT
																								X	X	X	3-17	1900805-011	8	PSA TRAY EXTENDER SET
								X	X				18-	2900037-011			X	X	X	15-17	1901981-011					X	2-3,5-14	1900931-011	7	PSA TEST POINT ADAPTER
										X	X	X	15-17	1901959-011				X	X	3-14 *	1900433-021					X	3-14	1900433-011	6	GSE J-BOX OVERHEAD
								X					17-	1902134-021			X	X	X	15-16	1902134-011					X	3-14	1900145-011	5	G & N COOLANT & POWER CONSOLE
															X	X	X	X	X	15-	1900000-021	X	X	X	X	X	3-14	1900000-011	4	OSCILLOGRAPH CONSOLE
																						X	X	X	X	X	1-	1900364-061	3	BLANK PANEL ASSY
	X	X	X			18-	2900023-011			X	X	X	3-17+	1901976-011				X	X	3-14 *	1900004-021					X	3-14	1900004-011	2	OPTICS INERTIAL ANALZER
	X	X					2900022-011			X				1902300-011				X		15-17	1900005-021					X	3-14	1900005-011	1	OPTICS INERTIAL TEST SET

NEXT ASSY	USED ON
1000000	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

AM
THIS
SHEET
ADDED

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO.
CONTRACT

DRAWN F P Greene DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C Sarlin
NASA APPROVAL
MIT APPROVAL 8.25.65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 6 OF 7

8 7 6 5 4 3 2 1

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939.	8-18-65	
AN	REVISED PER TDRR 23280	0-3-65	W/C
AP	REVISED PER TDRR 23537	10-28-65	W/C
AR	REVISED PER TDRR 25028	1-4-66	W/C
AS	REVISED PER TDRR 25330	1-?-66	W/C

NOTES:
1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB).
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ASCP), 8104002 (RAY), 8106001 (KIC).
3. EFF (S/N) FOLLOWED BY AN ASTERISK (*) ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.

NOTES	CONFIGURATION IV							CONFIGURATION III							CONFIGURATION II							CONFIGURATION I							ITEM	NOMENCLATURE OR DESCRIPTION
	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N	CAPABILITY					EFF. S/N	END ITEM P/N		
	L	2	1	5	0			L	2	1	5	0			L	2	1	5	0			L	2	1	5	0				
																													134	
																													133	
																													132	
																							X	X	X	X	1-36	1022880	131	SCT/SXT LENS COVERS
																						X							130	AOT LENS COVERS
																						X							129	AOT PURGE VALVE COVERS
																							X	X	X	X			128	OUA PURGE VALVE COVERS
																							X	X			1-37	1022970-011	127	CONNECTOR COVERS (OPTICS)
																						X						6014000	126	LEM AOT SHIPPING CONTAINER
																									X	X	1- 3	1019721	125	CASE ASSY, STORAGE MAP & DATA VIEWER
																								X	X	X	1- 5	1019700	124	SHIPPING & STORAGE CONT. OPT UNIT (INTERIM)
																	X			9-	*1019720-011				X	X	1-13	1019720	123	OPTICS-NAV BASE SHIPPING CONTAINER
																						X	X	X	X	X	1- 7	1019984-011	122	OPTICS CLEANING KIT
																							X	X			1- 8	1019926-011	121	G & N FIXTURE STAND
																							X	X			1- 7	1019970-011	120	STAR-HORIZON SIMULATOR CERT. FIXT.
																							X	X			1- 8	1019977	119	STAR-HORIZON SIMULATOR
																									X	X	1- 3	1016948	118	TESTER ASSY, MAP & DATA VIEWER
																							X	X	X	X	1- 7	1019840	117	RETROREFLECTING PRISM
																							X	X	X	X	1- 3	1019837	116	PORTABLE LIGHT ASSY
																							X	X	X	X	1- 9	1017376	115	WEDGE, VARIABLE DEVIATION
																							X	X	X	X	1- 5	1019759	114	ADJ MIRROR & PEDESTAL ASSY
																							X	X	X	X	1	1019758	113	TOOLING BAR ASSY
																						X	X	X	X	X	1- 7	1017447	112	THEODOLITE & SUPPORT ASSY
																							X	X	X	X		1021640	111	LIFTING FIXT., G&N INST. QUAL/AZ REF FIXT.
																							X	X	X	X	1- 3	1019760	110	G & N REFERENCE CERTIFICATION FIXT.
																							X	X	X	X	1- 3	1017383	109	G & N INSTALL. QUALIFICATION FIXT.
																X					1017382-011					X	1- 5	1017382	108	AZIMUTH REFERENCE FIXT.
																							X	X	X	X	1-12	1017381	107	45° AUTOCOLLIMATOR PLATE ASSY
																							X	X	X	X	1-22	1017380	106	0° AUTOCOLLIMATOR PLATE ASSY
																X	X	X	X	6-	1017387-011				X	X	1- 5	1017387	105	ALIGNMENT MIRROR CERTIFICATION FIXT
																X	X	X	X	6-	1016951-011				X	X	1- 5	1016951	104	ALIGNMENT MIRROR ASSY
																						X					1-	6014003	103	AOT TESTER
																							X	X	X	X	1- 3	1019769	102	SHAFT ACCURACY TESTER
																X	X	X	X	3-	1016949-011				X	X	1- 2	1016949	101	FUNCTIONAL TESTER ASSY
																X	X				1022942-011*				X	X	1- 3	1022942-000	100	PTF CALIBRATION KIT
																							X	X			1- 4	1019962-011	99	AUX PTF STAND
																X	X	X	X	3-	1016910-011				X	X	1-2	1016910	98	PRECISION TEST FIXTURE
																													97	
																													96	
																													95	
																													94	
																													93	
																													92	
																						X	X				1-32	2014013-011	91	AGC UNIV. DSKY HANDLING FIXTURE
																						X	X					1006422	90	AGC UNIV. DSKY SHIPPING CONTAINER
																								X			1-22	1020338	89	AGC MOUNTING KIT
																									X	X	1-22	1020339	88	AGC MOUNTING KIT
																								X	X	X	1-20	1020423	87	CONNECTOR COVERS (AGC)
																								X	X	X	1-20	1006231	86	AGC NAV DSKY SHIPPING CONTAINER
																								X	X	X	1-20	1006229	85	AGC MAIN DSKY SHIPPING CONTAINER
															X	X				21-	1006421			X	X	X	1-20	1006230	84	AGC SHIPPING CONTAINER
																								X	X	X	1-25	1014334	83	AGC NAV DSKY HANDLING FIXTURE
																								X	X	X	1-26	1014377	82	AGC MAIN DSKY HANDLING FIXTURE
								X	X					2014282-011			X	X	X		1020001-003					X	1-22	1020001	81	AGC HANDLING FIXTURE
																										X	1-4	1020225	80	FIXTURE ASSY, ALIGN AGC NAV DSKY
																												1020393	79	INTERCONNECT KIT, P&M
															X	X	X			16-22	2014255-011			X	X	X	3-15	1020313	78	AGC GSE INTERCONNECT KIT, G & N
															X	X	X			10-13	2014268-011			X	X	X	3-9	1020312	77	AGC GSE INTERCONNECT KIT, SUB-SYS
									X	X			1-11	2014014-011			X			10-11	1020343					X	1-9	1020195	76	MAIN DSKY MTG STAND
								X	X	X			10-13	2014024-011			X	X		9	1020342					X	1-8	1014465	75	AGC/CTS OPERATION CONSOLE
																						X	X	X			1-9	2014059	74	AUX CALIB SYS CONSOLE
								X	X	X			7-9	2014049-011			X	X	X	1-6 *	1020344-011					X	1-6	1014217	73	COMP CALIB. SYS CONSOLE
								X	X	X			20-26	2014042-011			X	X	X	17-19	1020341					X	3-16	1014156	72	AGC TEST SET
								X	X	X			16-27	2014048-011			X	X	X	12-15	1014061-011					X	3-11	1014061	71	COMP SIMULATOR

(AM)
THIS SHEET ADDED

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
1000000	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN F.P. Bosse DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C Sporling
NASA APPROVAL
MIT APPROVAL M C Mead 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE ——
WT
SHEET 7 OF 7

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK

REV															
SHEET															
REV STATUS OF SHEETS	REV		BJ	BC	BH	BC	BF	BF	BF	BF	BJ	BJ	BJ	BE	BE
	SHEET		1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 13

ML 1377A6 12-65

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 6 OF 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 7 OF 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	.0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 8 OF 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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SCALE-NONE	REV LTR BJ	SHEET 9 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1431	051	34	1902204-011	G&N MTG.FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BJ	SHEET 10 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BJ	SHEET 11 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48.	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE.LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH.TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE.AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE.AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE.AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2 of 13

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BH	SHEET 3 OF 13

FORM 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 4 of 13

MIL 2084 9-65

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 5 OF 13

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	BF	SHEET 6 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	BF	SHEET 7 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	BF	SHEET 8 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	BJ	SHEET 9 OF 13

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APPLICATION	
NEXT ASSY	USED ON
1000000	

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REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK

REV STATUS OF SHEETS														
REV	BL	BC	BL	BL	BF	BF	BF	BF	BJ	BJ	BK	BE	BE
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 13

ML 1377A6 12-65

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
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BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK

(M)

REV														
SHEET														
REV STATUS OF SHEETS	REV	BL	BC	BL	BL	BF	BF	BF	BF	BJ	BJ	BK	BE	BE
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

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CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 13

MIL 1577A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BC | SHEET 22 of 13

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BL | SHEET 3 OF 13

FORM 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY, S.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BF | SHEET 5 OF 13

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RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT..UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	C512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	AGED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.RELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	
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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	
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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK
BR	REVISED PER TDRR 32806	31 JAN 67	JRK JAC

REV															
SHEET															
REV STATUS OF SHEETS	REV	BR	BC	BL	BL	BF	BF	BP	BP	BP	BP	BP	BR	BP	BP
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER GPUKK 2FEB65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2FEB65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-65

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 6

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 7

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 8

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 9

FORM 2084 9-65

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                     APOLLO G+N GSE                           06-14-66                                         1
                          1900030   REVISION BB                                                            OF 10

                                    KOLLSMAN
ITEM  CAPI-    TEST      PART NO.             TITLE                           REMARKS
 NO.  BILITY CONFIG
      0512LR 12345678

0010  XX           7  1016910-000  PRECISION TEST FIXTURE
0011  0512         7  1016910-011  PRECISION TEST FIXTURE
0020  0512         7  1022962-011  AUX PTF STAND                              NOT END ITEM
0030  XX12         7  1022942-000  PTF CALIBRATION KIT                        NOT END ITEM
0031  0512         7  1022942-011  PTF CALIBRATION KIT                        NOT END ITEM
0040  XX           7  1016949-000  FUNCTIONAL TESTER ASSY
0041  XX12         7  1016949-011  FUNCTIONAL TESTER ASSY
0042  051X         7  1016949-021  FUNCTIONAL TESTER ASSY
0043  0512         7  1016949-031  FUNCTIONAL TESTER ASSY
0050  0512          8 1019769-000  SHAFT ACCURACY TESTER
0060      L        7  6014003-000  AOT TESTER
0070  051           8 1016951-000  ALIGNMENT MIRROR ASSY
0080  XXX2         7  1017387-000  ALIGNMENT MIRROR ASSY CERT. FIXT.
0081  051          7  1017387-011  ALIGNMENT MIRROR ASSY CERT. FIXT.
0090  0512     3    8 1017380-000  0 DEGREE AUTOCOLL. PLATE ASSY
0100  0512     3    8 1017381-000  45 DEGREE AUTOCOLL. PLATE ASSY
0110  XX              1017382-000  AZIMUTH REF FIXTURE                        OBSOLETE
0111  XX12            1017382-011  AZIMUTH REF FIXTURE                        OBSOLETE
0120  XX     1        1017383-000  G+N INSTALL.QUAL.FIXTURE
0121  0512   1        1017383-011  G+N INSTALL.QUAL.FIXTURE
0130  0512         7  1019760-000  G+N REF.CERT.FIXTURE
0140  0512   1        1021640-000  LIFTING FIX.G+N QUAL.AND AZIMUTH REF       MIT BUILT
0150  0512L      5    1017447-000  THEODOLITE AND SUPPORT ASSY
0151  0512       5    1017447-011  THEODOLITE AND SUPPORT ASSY
0160  0512          8 1019758-000  TOOLING BAR ASSEMBLY                       ACED ONLY
0170  0512L      5    1019759-000  ADJ.MIRROR AND PEDESTAL ASSY.
0180  0512          8 1017376-000  WEDGE,VARIABLE DEVIATION
0190  XX     1        1019837-000  PORTABLE LIGHT ASSEMBLY
0191  0512       5    1019837-011  PORTABLE LIGHT ASSEMBLY
0200  0512     3    8 1019840-000  RETROREFLECTING PRISM
0210  X            7  1016948-000  TESTER ASSY MDV                            OBSOLETE
0220    XX   1 3   78 1019977-011  STAR+HORIZON SIMULATOR                     OBSOLETE
0221  0512          8 1019977-021  STAR + HORIZON SIMULATOR
0230  05XX         7  1019970-011  STAR + HORIZON SIMULATOR CERT. FIXT.
0231    12L      5    1019970-021  STAR + HORIZON SIMULATOR CERT. FIXT.
0240    XX            1019926-011  G+N FIXTURE STAND                          OBSOLETE
0250  0512L  1        1019984-011  OPTICS CLEANING KIT
0260  XX         5    1019720-000  OPTICS N/B SHIPPING CONT.                  OBSOLETE
0261  0512            1019720-011  OPTICS N/B SHIPPING CONT.                  OBSOLETE
0270  XX              1019700-000  SHIPPING + STORAGE CONT.(OUA)              OBSOLETE
0280  X               1019721-000  CASE ASSY STORAGE MDV                      OBSOLETE
0290      L      5    6014000-000  LEM AOT SHIPPING CONT.
0291      L      5    6014000-011  LEM AOT SHIPPING CONT.
```

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD

REV STATUS OF SHEETS	REV	BB	BB	BB	BB	BB	BB	BB	BB	BB	BB	BB	BB	BB	BB
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
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ENGINEER
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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-65

8 7 6 5 4 3 2 1

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REVISIONS 00995

SYM	DESCRIPTION	DATE	APPROVAL
AF	REVISED PER TDRR 15981	2-2-65	
AG	CHANGED NUMBER OF SHEETS FROM 1 TO 3 REVISED PER TDRR 17228 Cal 3/9/65	3/9/65	
AH	REVISED PER TDRR - 17571	3-18-65	
AJ	REVISED PER TDRR 18580	4/23/65	WK
AK	REVISED PER TDRR 18999	5-10-65	
AL	REVISED PER TDRR 19719	5-17-65	WK
AM	REVISED PER TDRR 21939	8-18-65	MGM
AN	REVISED PER TDRR 23280	10-15-65	WK
AP	REVISED PER TDRR 23537	10-28-65	WK
AR	REVISED PER TDRR 25028	1-4-66	WK
AS	REVISED PER TDRR 25330	1-17-66	WK
AT	" " " 27541	7-1-66	MGM
AU	" " " 27716	"	MGM
AV	" " " 28561	"	MGM
AW	" " " 28560	"	MGM
AY	" " " 28997	"	MGM
AZ	" " " 28996	"	MGM
BA	" " " 29234	"	MGM
BB	REPLACED " " 29695	"	MGM

NOTES:

1. 011 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

PRE-BASELINE

2. 021 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 041 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS).
5. 051 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS (✓)

POST-BASELINE

6. 061 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING WITH GYRO CAGING.
7. 071 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING WITH GYRO CAGING.
8. 081 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N/CSS) WITH GYRO CAGING.

9. 091 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
10. 001 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
11. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).
12. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
13. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

DOCUMENTS						QUANTITY REQUIRED											END ITEM		
MISC	CMRM	ND	FTM	MODEL NO.	PS	PC	-001	-091	-081	-071	-061	-051	-041	-031	-021	-011	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				A-23-254		K	1										74	1022942-000	PTF CALIBRATION KIT
				H-23-207	DWG	M						✓				1	73	1021640	LIFTING SLING, G & N INST QUAL. FIXT./AZ REF. FIXT.
				A-23-201		A										1	72	1902431-011	PSA ADAPTER MODULE (CARRY ON)
	1021034			H-23-122	DWG	A			1	1	1	✓					71	1900009-021	G & N TRANSPORTATION CART
				A-23-102	—	A			1	1	1						70	1900433-021 *	GSE J-BOX OVERHEAD
				C-23-404	—	A			1	1	1						69	1900004-021 *	OPTICS INERTIAL ANALYZER
	1021034			H-23-185	DWG	A			1	1		✓	1	1		1	68	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT
				A-23-250	DWG	A							1		1		67	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
				A-23-251	DWG	A							1	1			66	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-114	DWG	A										1	65	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
				S-23-101	1901492-011	A										1	64	1901492-011	AUXILIARY BATTERY PACK
	1021034			H-23-193	—	A			1	1		✓	1	1		1	63	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
	1021035		1900005	A-23-198	—	A			1	1	1		1	1	1		62	1901308-011 *	GSE TO G & N INTERCONNECT CABLES
	1021035		1900005	A-23-167	1900931	A			1	1	1		1	1	1		61	1900931-011 *	PSA TEST POINT ADAPTER
	1021034	1002065		A-23-080	—	A			1		1		1		1		60	1900926-011	ROTARY TABLE ASSY
																	59		
																	58		
																	57		
				A-23-205	DWG	R						✓					56	1020339	AGC MOUNTING KIT
	1021034			A-23-98	DWG	A			1		1	✓	1		1		55	1900810-011	ROTARY TABLE CALIB SET
	1021035		1900005	A-23-100	—	A			1	1	1		1	1	1	1	54	1900805-011 *	PSA TRAY EXTENDER SET
	1021034			A-23-105	1900804	A			1	1	1	✓	1	1	1		53	1900804-011	IMU PRESSURE SEAL TESTER
	1021034			A-23-094	1900803	A			1	1	1	✓	1	1	1	1	52	1900803-011	FILLING & PURGING FIXTURE
	1021034			A-23-104	1900802	A			1	1	1	✓	1	1	1	1	51	1900802-011	IMU SNAP-ON BELLOWS
	1021034			A-23-099	DWG	A			1		1	✓	1		1		50	1900800-011	IMU MTG ALIGN CALIB TOOL SET
	1021034			A-23-101	1900797	A			1	1	1	✓	1	1	1		49	1900797-011/021	LOAD & SIGNAL SIMULATOR SET
	1021035		1900005	A-23-108	—	A			1	1	1		1	1	1		48	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
	1021034			A-23-090	DWG	A			1		1		1		1		47	1900606-011	PSA MTG FIXTURE
	1021034			A-23-107	1900491	A			1				1				46	1900491-011	REMOTE OPTICS CONTROLLER
ATP 1900433	1021035		1900005	A-23-102	—	A							1	1	1		45	1900433-011 *	GSE-J BOX OVERHEAD
	—			A-23-197	DWG	A				1				1			44	1900364-061	BLANK PANEL ASSY
	1021034			S-23-100	1900342	A			1	1	1	✓	1	1	1	1	43	1900342-011	INERTIAL COMP TEMP CONTROLLER
	1021034			A-23-103	1900299	A			1	1	1	✓	1	1	1	1	42	1900299-011	DEGAUSSER ASSY
	1021034			A-23-106	1900268	A			1		1		1		1		41	1900268-011	GSE PSA-J BOX
	1021035		1900005	C-23-411	—	A			1	1	1		1	1	1		40	1900145-011 *	G & N COOLANT & POWER CONSOLE
	1021034			A-23-093	DWG	A			1	1			1	1			39	1900014-011	G & N MTG FIXTURE
	1021034			A-23-092	DWG	A			1	1			1	1			38	1900013-011	OPTICS NAV BASE MTG FIXTURE
	1021034			A-23-091	DWG	A			1		1		1		1		37	1900012-011	IMU MTG FIXTURE
	1021034			H-23-123	1900010	A						✓					36	1900010-011	IMU SHIPPING CONTAINER
	1021034			H-23-122	DWG	A			1	1	1	✓	1	1	1		35	1900009-011	TRANSPORTATION CART, G & N ASSY
	1021035		1900005	NA	1900005	A											34	1900005-011	OPTICS INERTIAL TEST SET
	1021035		1900005	C-23-404	—	A							1	1	1		33	1900004-011 *	OPTICS INERTIAL ANALYZER
	1021035		1900005	C-23-500	—	A			1	1	1		1	1	1		32	1900000-011 *	OSCILLOGRAPH CONSOLE
	—			A-23-081	DWG	R			1	1			1	1			31	1020195	MAIN DSKY MTG STAND
	—			H-23-190	DWG	R			1	1			1	1			30	1020001	AGC HANDLING FIXTURE
	1021066		1019840	A-23-200	1019840	K			1	1			1	1		1	29	1019840	RETROREFLECTING PRISM
	1021066			A-23-196	1019837	K	1		1	1			1	1		1	28	1019837	PORTABLE LIGHT ASSY
	1021066			C-23-593	1019769	K			1	1			1	1			27	1019769	SHAFT ACCURACY TESTER
	1021066			A-23-109	1019759	K			1	1			1	1			26	1019759	ADJ MIRROR & PEDESTAL ASSY
	1021066			A-23-199	1019758	K			1	1		✓	1	1			25	1019758	TOOLING BAR ASSY
	1021066		1019721	H-23-197	1019721	K						✓					24	1019721	CASE ASSY. STORAGE MAP & DATA VIEWER
	1021066		1019720	H-23-186	1019720	K						✓					23	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
	1021066			H-23-199	1019700	K						✓					22	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT (INTERIM)
	1021066			A-23-079	1017447	K			1	1		✓	1	1		1	21	1017447	THEODOLITE & SUPPORT ASSY.
	1021066		1017383	A-23-097	1017383	K										1	20	1017383	G & N INSTALL QUALIFICATION FIXTURE
	1021066		1017382	A-23-096	1017382	K										1	19	1017382	AZIMUTH REFERENCE FIXTURE
	1021066			A-23-111	1017381	K			1	1			1	1			18	1017381	45° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-110	1017380	K			2	1			2	1			17	1017380	0° AUTOCOLLIMATOR PLATE ASSY
	1021066			A-23-077	1017376	K			1	1			1	1			16	1017376	WEDGE VARIABLE DEVIATION
	1021066		1016951	A-23-067	1016951	K			1	1			1	1			15	1016951	ALIGNMENT MIRROR ASSY
	1021068		1016949	C-23-502	1016949	K	1										14	1016949	FUNCTIONAL TESTER ASSY
	1021071		1016948	C-23-421	1016948	K	1										13	1016948	TESTER ASSY, MAP & DATA VIEWER
	1021070		1016910	A-23-095	1016910	K	1										12	1016910	PRECISION TEST FIXTURE
				H-23-198	SCD	M			1	1	1		1	1	1		11	1015462	IMU LIFTING FIXTURE
				A-23-162	SCD	M										1	10	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
ND1002222	1021000	1021001	1014465	C-23-501	—	R		1	1				1				9	1014465	AGC/CTS OPERATION CONSOLE
				H-23-191	DWG	R		1	1				1				8	1014377	AGC MAIN DSKY HANDLING FIXTURE
				H-23-192	DWG	R		1	1				1				7	1014334	AGC NAV DSKY HANDLING FIXTURE
ND1002194	1021002	1021001	1014217	C-23-403	—	R		1	1	1	1		1	1	1		6	1014217	COMP CALIB SYS CONSOLE
ND1002192	1021000	1021001	1014156	C-23-402	—	R		1	1	1			1	1			5	1014156	AGC TEST SET
ND1002193	1021003	1021001	1014061	C-23-401	—	R			1		1		1		1		4	1014061	COMP SIMULATOR
				H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
				H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
				H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

DOCUMENT NO.	DOCUMENT DESCRIPTION
2900224	PSA ADAPTER MODULE MECH. DIAG. (CARRY ON)
E-1432	APOLLO GSE FAMILIARIZATION MANUAL
ND1002205	TEST SPEC OSCILLOGRAPH GROUP
ND1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP
ND1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL
1900262	APOLLO - GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.
1900258	TEST CONTROL MECH. DIAG.
1900144	GSE POWER CONT. & DISTR. MECH. DIAG.
1900100	GSE OPTICS TEST MECHANIZATION DIAG.
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONTROL MECH. DIAG.
1900077	GSE COUNTER SIGNAL SELECT MECH. DIAG.
1900066	AGC-GSE SIGNAL SELECT MECH. DIAG.
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.

MISCELLANEOUS DOCUMENTS

REPLACED With CHANGE (Computer Printout) By Rev. BB

MASTER

BLOCK I, 0 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN R. G. Jones DATE 1965
CHECKED 2/2/65
APPROVAL
APPROVAL C. Dudley
NASA APPROVAL
MIT APPROVAL 2/2/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 1 OF 7

BB 1900030

8 7 6 5 4 3 2 1

APOLLO G&N GSE

GLOSSARY

ITEM NO. | CAPA-BILITY 0512LR | PART NUMBER | TITLE | MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET 2 of 14

MIL 2084 9.65

APOLLO G&N GSE

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	0512	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE.VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET 3 of 14

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APOLLO G&N GSE

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET 4 of 14

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APOLLO G&N GSE

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520.	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	512L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.KIT SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.KIT S/S	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET 5 of 14

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A P O L L O G & N G S E

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
582	12L	34 6	2014255-021	INTERCONN. KIT SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	5	5	2014282-011	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016315-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET 6 ~~5~~ of ~~35~~ 14

A P O L L O G & N G S E

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1030	05	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	PART OF 1901930
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	✓ 1901933-011	GSE PSA J-BOX	
1074	5	2 4	✓ 1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	✓ 1901933-031	GSE PSA J-BOX	PART OF 1901930
					PART OF 1901930

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET 7 ~~4~~ of ~~35~~ 14

A P O L L O G & N G S E

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	PART OF 1901930
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	051	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	2L	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1172	051	234	1902134-021	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1900876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET [illegible] of ~~35~~ 14

A P O L L O G & N G S E

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1071 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1071 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1320	L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1321	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1330	2	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	✓ 2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR BB	SHEET 9 ~~6~~ of ~~35~~ 14

APOLLO G&N GSE

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1421	051	34 8	1902301-011	OPTIC/NB.MTG.FIXTURE	
1422	2L	34 8	2900072-011	OPTIC/NB.MTG.FIXTURE	
1430	0	34	1900014-011	G&N MTG.FIXTURE	
1431	051	34	1902204-011	G&N MTG.FIXTURE	
1432	2L	34	2900067-011	G&N MTG. FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART.G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART.G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART.G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE.PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE.CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	L	2 4	2900677-011	MTG PLATE.COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE.COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE.COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	

SIZE	CODE IDENT NO.		
A	80230	1900030	
SCALE-NONE	REV LTR BB		SHEET 10 ~~9~~ of ~~13~~ 14

APOLLO G&N GSE

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1581	051	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	2LR	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	1	1	1902431-031	PSA ADAPTER MODULE	
1603	2	1	2901143-011	PSA ADAPTER MODULE(BLK II)	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12L	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.		
A	80230	1900030	
SCALE-NONE	REV LTR BB		SHEET 11 ~~10~~ of ~~13~~ 14

APOLLO G&N GSE

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	H-23-126(GAEC LS
07	9C 420-11075)			
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
16	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	S-23-114(GAEC LS
20	9C 410-31058)			
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267

SIZE	CODE IDENT NO.		
A	80230	1900030	
SCALE-NONE	REV LTR BB		SHEET 12 ~~11~~ of ~~13~~ 14

APOLLO G&N GSE

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE.LEM	GAEC LSC 410-310
50	980			
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254

SIZE	CODE IDENT NO.		
A	80230	1900030	
SCALE-NONE	REV LTR BB		SHEET 13 ~~12~~ of ~~13~~ 14

APOLLO G&N GSE

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
56	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR 88	SHEET 14 ~~13~~ of ~~15~~ 14

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                                  APOLLO G+N GSE                        06-14-66                  2
        P                              1900030   REVISION BB                                          OF 10

                                                  KOLLSMAN
      ITEM   CAPI-    TEST      PART NO.               TITLE                         REMARKS
       NO.   BILITY  CONFIG
             0512LR  12345678

      0300       L       5      6014056-011   AOT LENS COVERS
      0310   0512        5      1022980-011   SCT/SXT LENS COVERS
      0320       L       5      6014319       CONNECTOR COVERS AOT
      0330    51     1          1022963-011   STAR TRACKER COVERS                     DELETED SEE ITEM 360
      0340   0512    1          1001844-004   SYSTEM CONN. COVERS                     DELETED SEE ITEM 360
      0350   0512    1          1001844-005   SYSTEM CONN. COVERS
      0360   0512        5      1022787-011   CONN.COVER PROTECT (OUA)
      0370    5            7    1022934-011   CABLE ASSY W-17                         USE WITH FUNCTIONAL TESTER
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8 7 6 5 4 3 2 1

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NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
					A-23-254		K				1							76	1022942-000	PTF CALIBRATION KIT
					H-23-207	DWG	M						✓				1	75	1021640	LIFTING FIXT. G & N INST. QUAL. FIXT./AZ REF. FIXT
					A-23-201		A										1	74	1902431-011	PSA ADAPTER MODULE (CARRY ON)
					N.A.	——	A							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.
					A-23-250	DWG	A							1		1		71	1901875-011	HOSE SET GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198	——	A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080	——	A							1		1		64	1900926-011	ROTARY TABLE ASSY
						DWG	K							1	1	1		63	1022934	CABLE W17
																		62		
																		61		
																		60		
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100	——	A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108	——	A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102	——	A							1	1	1		49	1900433-011 *	GSE-J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901333	A	PART OF 1901930										45	1901333-031	GSE PSA-J BOX
		1021035		1900005	C-23-411	——	A							1	1	1		44	1900145-011*	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G & N ASSY
		1021035		1900005	N.A.	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404	——	A							1	1	1		37	1900004-021*	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500	——	A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
					C-23-425	——	R							1				35	1020393	INTERCONNECT KIT P & M
					C-23-403	——	R					1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE
					C-23-501	1020342	R					1		1				33	1020342	AGC/CTS OPERATION CONSOLE
					C-23-402	——	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	——	R					1		1				31	1020339	MOUNTING KIT
					C-23-424	——	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					C-23-423	——	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-190		R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720-011	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	——	R							1		1		4	1014061-011	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR -17571			3-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.		4/23/65	WK
AK		REVISED PER TDRR 18999	F.P.G		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-13-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
Ⓝ AP		REVISED PER TDRR 23537	F.P.G.		10-28-65	WK
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK
AS		REVISED PER TDRR 25330	JEF		1-17-66	WK
AT		" " " 27541	RAJ		7-1-66	MGM
AU		" " " 27716	"		"	MGM
AV		" " " 28561	"		"	MGM
AW		" " " 28560	"		"	MGM
AY		" " " 28997	"		"	MGM
AZ		" " " 28996	"		"	MGM
BA		" " " 29234	"		"	MGM
BB		REPLACED " " 29695	"		"	MGM

REPLACED With CHANGE
(Computer Printout) By Rev BB

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900224	MECH. DWG, PSA ADAPTER MODULE (CARRY ON)	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S.S.)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

MISCELLANEOUS DOCUMENTS

Ⓐ THIS SHEET ADDED

BLOCK I
50 SERIES

1900030 BB

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. A. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Sparling 3/9/65
APPROVED MIT W. Marley 3-9-65
APPROVED MSC G. C. Mott 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 2 OF 7

```
                        APOLLO G+N GSE                            06-14-66                                            3
P                            1900030   REVISION BB                                                                OF 10

                                          RAYTHEON

 ITEM   CAPI-    TEST       PART NO.              TITLE                                REMARKS
  NO.   BILITY  CONFIG
        0512LR  12345678

 0510   05       2         1014061       COMPUTER SIMULATOR
 0511   051      2         1014061-011   COMPUTER SIMULATOR
 0512   051      2         1014061-011   COMPUTER SIMULATOR (MOD 1)
 0513   0512L    2         2014048-011   COMPUTER SIMULATOR
 0520   0         34 6     1014156       AGC TEST SET
 0521   051       34 6     1020341       AGC TEST SET
 0522     12L     34 6     2014042-011   AGC TEST SET
 0523     12L     34 6     2014042-021   AGC TEST SET
 0524     12L     34 6     2014042-031   AGC TEST SET
 0530   05        34 6     1014217       AGC CALIBRATION CONSOLE
 0531   051       34 6     1020344-011   AGC CALIBRATION CONSOLE
 0532     12L     34 6     2014049-011   AGC CALIBRATION CONSOLE
 0533     12L     34 6     2014049-021   AGC CALIBRATION CONSOLE
 0540    512L     34 6     2014059-011   AUX AGC CALIBR.CONSOLE
 0541     12L     34 6     2014059-021   AUX AGC CALIBRATION CONSOLE
 0550   0          4 6     1014465       OPERATION CONSOLE
 0551   051        4 6     1020342       OPERATION CONSOLE
 0552     12L      4 6     2014024-011   OPERATION CONSOLE
 0553     12L      4 6     2014024-021   OPERATION CONSOLE
 0560   05        34       1020195       MAIN DSKY PEDESTAL MOUNT
 0561   051       34       1020343       MAIN DSKY PEDESTAL MOUNT
 0562   051       34       1020343-011   MAIN DSKY PEDESTAL MOUNT
 0563   051       34       1020343-021   MAIN DSKY PEDESTAL MOUNT
 0564     12L     34       2014014-011   MAIN DSKY PEDESTAL MOUNT
 0570   051        4 6     1020312       INTERCONN.KIT SUB-SYSTEM
 0571     12L      4 6     2014268-011   INTERCONN.KIT SUB-SYSTEM
 0572     12L      4 6     2014268-021   INTERCONN.KIT S/S
 0580   051       34 6     1020313       INTERCONN.KIT SYSTEM
 0581     12L     34 6     2014255-011   INTERCONN.KIT SYSTEM
 0582     12L     34 6     2014255-021   INTERCONN. KIT SYSTEM
 0590   0       1          1020225       ALIGNMENT FIXT.NAV. DSKY
 0600   0           5      1020001-001   HANDLING FIXTURE AGC
 0601   0           5      1020001-002   HANDLING FIXTURE AGC
 0602    51         5      1020001-003   HANDLING FIXTURE AGC
 0603    51         5      1020001-004   HANDLING FIXTURE AGC
 0604    5          5      2014282-011   HANDLING FIXTURE AGC
 0610   051         5      1014377       HANDLING FIXT.MAIN DSKY
 0611   051         5      1014377-011   HANDLING FIXT.MAIN DSKY
 0620   051         5      1014334       HANDLING FIXTURE.NAV. DSKY
 0621   051         5      1014334-011   HANDLING FIXT.NAV. DSKY
 0630   051         5      1006230       SHIPPING CONTAINER AGC                         UPDATED TO ITEM  0631
 0631      2L       5      1006421       SHIPPING CONTAINER AGC
 0640   051         5      1006229       SHIPPING CONTAINER MAIN DSKY                   UPDATED TO ITEM 0670,PT OF 0730
 0650   051         5      1006231       SHIPPING CONTAINER NAV. DSKY                   UPDATED TO ITEM 0670,PT OF 0720
```

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	MISC	MANUAL	N D	F T M	MODEL NO.	P S	PC				271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
					A-23-204	1019926	K				1							84	1019926-011	G&N FIXTURE STAND
					A-23-254		K				1							83	1022942-011	PTF CALIBRATION KIT
					A-23-252	1019962	K				1							82	1019962-011	AUX PTF STAND
		ND102 039			H-23-209	DWG	A						✓					81	1902430-011	COVER SET, ELECTRICAL CONN.
		ND 1021039			H-23-208	DWG	R						✓					80	1020423	CONNECTOR COVERS (AGC)
		ND 1021039			A-23-042		R										1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND 1021039			H-23-206		K						✓					78	TBA	OUA PURGE VALVE COVERS
		ND 1021039			S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
		ND 1021039			H-23-194		K						✓				1	76	1022970-011	CONNECTOR COVERS (OPTICS)
		ND 1021039			A-23-166		K						✓				1	75	1022880	OPTICS COVERS
		ND 1021040			A-23-202	1019970	K						✓					74	1019970	STAR – HORIZ SIMULATOR CERT. FIXTURE
		ND 1021040			A-23-202	1019977	K							1	1			73	1019977	STAR – HORIZ SIMULATOR
		ND 1021039			H-23-185	DWG	A						✓	1	1		1	72	1901846-021	G & N HARNESS HANDL. & SHIPPING FIXTURE
					A-23-250	DWG	A							1		1		71	1901875-011	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
					A-23-251	DWG	A							1	1			70	1901876-011	HOSE SET, GSE COOLANT INTERCONN, G&N
		ND102 039			A-23-114	DWG	A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND 1021039			S-23-101	1901492	A										1	68	1901492-021	AUXILIARY BATTERY PACK
		ND 1021039			H-23-193	DWG	A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
					A-23-201		A										1	66	1902431-021	PSA ADAPTER MODULE (CARRY ON)
		ND 1021040			A-23-167	1901981	A							1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND 1021040	1002065		A-23-080	—	A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
																		61		
					H-23-207	DWG	M						✓				1	60	1021640	LIFTING FIXT, G&N INST. QUAL. FIXT./AZ REF. FIXT.
		ND 1021040			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND 1021040			A-23-100	*	A							1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND 1021040			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND 1021040			A-23-094	DWG	A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND 1021039			A-23-104	1900802	A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
		ND 1021040			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND 1021040			A-23-101	1900797-021	A						✓	1	1	1		53	1900797-021/031	LOAD & SIGNAL SIMULATOR SET
		ND 1021040			A-23-108	DWG	A							1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND 1021040			A-23-090	DWG	A							1		1		51	1900606-021	PSA MTG FIXTURE
		ND 1021040			A-23-107	1902046	A							1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND 1021040			A-23-102	1901959	A							1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
		ND 1021040			A-23-197	DWG.	A								1			48	1900364-061	BLANK PANEL ASSY
		ND 1021039			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND 1021039			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND 1021040			A-23-106	1900268-031	A							1		1		45	1902195-021	GSE/PSA-J BOX
		ND 1021040			C-23-411	*	A							1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND 1021040			A-23-093	DWG	A							1	1			43	1902204-011	G&N MTG FIXTURE
		ND 1021040			A-23-092	DWG	A							1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND 1021040			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		ND 1021039			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND 1021039			H-23-122	DWG	A						✓	1	1	1		39	1900005-021	TRANSPORTATION CART, G & N, ASSY
		ND 1021040		1900005-031	NA	1900005-031	A											38	1902300-011	OPTICS INERTIAL TEST SET
		ND 1021040			C-23-404	*	A							1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND 1021040			C-23-500	*	A							1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND 1021040			C-23-425	DWG	R							1				35	1020393	INTERCONNECT KIT, P&M
		ND 1021040		1020344	C-23-403	1014217	R					1		1	1	1		34	1020344-011	COMP CALIB SYS CONSOLE
		ND 1021040		1020342	C-23-501	1020342	R					1		1				33	1020342	AGC/CTS OPERATION CONSOLE
		ND 1021040		1020341	C-23-402	1020341	R					1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R							1				31	1020338	MOUNTING KIT
		ND 1021040			C-23-424	DWG	R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
		ND 1021040			C-23-423	DWG	R					1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND 1021040			A-23-081	DWG	R							1	1			28	1020343	MAIN DSKY MTG STAND
		ND 1021039			H-23-190	DWG	R							1	1			27	1020001-003	AGC HANDLING FIXTURE
		ND 1021039			A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND 1021039			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND 1021040			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		ND 1021040			A-23-109	1019759	K							1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND 1021040			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
																		21		
		ND 1021039			H-23-186	1019720	K						✓					20	1019720-011	OPTICS–NAV BASE, SHIPPING CONTAINER
		ND 1021039			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND 1021040			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND 1021039			A-23-097	1017383	K										1	17	1017383	G & N INSTALL. QUALIFICATION FIXTURE
		ND 1021039			A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND 1021040			A-23-111	1017381	K							1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-110	1017380	K							2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND 1021040			A-23-077	1017376	K							1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND 1021040			A-23-067	1016951	K							1	1			12	1016951-011	ALIGNMENT MIRROR ASSY.
		ND 1021040			C-23-502	2010605	K				1							11	1016943-011	FUNCTIONAL TESTER ASSY.
																		10		
		ND 1021040			A-23-095	2010606	K				1							9	1016910-011	PRECISION TEST FIXTURE
		ND 1021040			H-23-198	DWG	M							1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND 1021039			A-23-162	DWG	M										1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND 1021039			H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND 1021039			H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11		ND 1021040		1014061	C-23-401	1014061	R							1		1		4	1014061-011	COMP. SIMULATOR
		ND 1021039			H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND 1021039			H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
		ND 1021039			H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

DOCUMENTS — QUANTITY REQUIRED — END ITEM

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11 P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			3-16-65	
AJ		REVISED PER TDRR 18580	F.P.G.			
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65	
AL		REVISED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	
AR		REVISED PER TDRR 25028	J.E.F.		1-4-66	
AS		REVISED PER TDRR 25330	J.E.F.		1-17-66	
AT		" " " 27541	RAJ		7-1-66	
AU		" " " 27716	"		"	
AV		" " " 28561	"		"	
AW		" " " 28560	"		"	
AY		" " " 28997	"		"	
AZ		" " " 28996	"		"	
BA		" " " 29234	"		"	
BB		REPLACED " " 29695	"		"	

REPLACED With CHANGE
(Computer Printout) By Rev BB

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
1022866	DIAG. MECH. AZIMUTH REF. FIXTURE	
2900221	DIAG. MECH. PSA ADAPTER MODULE (CARRY ON)	
ND1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND1021041	G&N SYSTEM MANUAL	
1019890	DIAG. MECH FUNCTIONAL TESTER	
1019883	DIAG. MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG. MECH STAR & HORIZON SIMULATOR	
1019899	DIAG. MECH G&N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I
100 SERIES

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R. a. Jones 2/25/65
CHECKED
APPROVED
APPROVED C. Sparling 3/4/65
APPROVED MIT M. B. Murley 3-9-65
APPROVED MSC 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 3 OF 7

BB
1900030

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                         APOLLO G+N GSE                          06-14-66                              4
   P                         1900030   REVISION BB                                                  OF 10

                                            RAYTHEON

 ITEM  CAPI-    TEST      PART NO.            TITLE                                   REMARKS
  NO.  BILITY  CONFIG
       0512LR  12345678

 0660  0           5     1020339       MOUNTING KIT AGC (BLK I)
 0661   51         5     1020338       MOUNTING KIT AGC (100 SERIES)
 0670     2L       5     1006422       SHIPPING CONTAINER, UNIVERSAL DSKY        PART OF ITEM 0690
 0680     2L       5     2014013-011   HANDLING FIXT.,UNIVERSAL DSKY
 0690     2L       5     2016316-011   SHIPPING KIT UNIVERSAL DSKY
 0700     2L       5     2016318-011   AGC CONN.COVER GROUP
 0710     2L         7   2014399       CONNECTOR COVER KIT BLKII                 PART OF ITEM 0700
 0720  051         5     2016312-011   SHIPPING KIT,NAV. DSKY
 0730  051         5     2016313-011   SHIPPING KIT,MAIN DSKY
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REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	WK
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK
AS		REVISED PER TDRR 25330	JEF		1-17-66	WK
AT		" " " 27541	RAJ		6-30-66	
AU		" " " 27716	"		"	
AV		" " " 28561	"		"	
AW		" " " 28560	"		"	
AY		" " " 28997	"		7-1-66	
AZ		" " " 28996	"		"	
BA		" " " 29234	"		"	
BB		REPLACED " " 29695	"		"	

NOTES

1. 311 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.
2. 321 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.
3. 331 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.
4. 341 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/ OSS/ G&N/ CSS).
5. 351 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 361 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.
7. 371 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET.
9. THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.
11. CALIB. SYS CONSOLE CAN BE USED IN LIEU OF AUX. CALIB. SYS CONSOLE.

NOTES	MISC	CMRM	N D	MODEL NO.	P S	P C	371	361	351	341	331	321	311	ITEM NO.	PART NO. IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
						A			✓					89	2900998-011	PSA HANDLING FIXTURE BLK II
				A-23-256		A						1		88	2900145-011	PTA/PEA TEST POINT ADAPTER
						A								87		CABLE BREAK-OUT BOXES
SEE NOTE 11				C-23-409	2014059	R				1	1	1		86	2014059-011	AUX CALIB SYS CONSOLE
				A-23-255		A				1	1	1		85	2900066-011	PTA/PEA MOUNTING FIXTURE
				S-23-105	2900063	A			✓				1	84	2900063-011	LIFTING TEMP CONTROLLER
MECH DWG 1022838				H-23-194		K			✓				1	83	1022970-011	CONNECTOR COVERS (OPTICS)
				H-23-208	DWG	R			✓				1	82		CONNECTOR COVERS (AGC)
				H-23-209		A			✓				1	81	2900065-011	CONNECTOR COVERS (ISS)
MECH DWG 1019899				A-23-204	1019926	K	1							80	1019926-011	G&N FIXTURE STAND
									1				1	79	2901380-011	OPTICS INSTAL. HANDLING FIXT. ASSY
				H-23-206		K			✓					78		DUA PURGE VALVE COVERS
MECH DWG 1022864	& 1022870			S-23-104		K			✓				1	77	1019984-011	OPTICS CLEANING KIT
				A-23-254		K	1							76	1022942	PTF CALIBRATION KIT
MECH DWG 1022865				A-23-166		K			✓				1	75	1022880	OPTICS COVERS
MECH DWG 1019883				A-23-203	1019970	K			✓					74	1019970	STAR – HORIZ SIMULATOR CERT FIXTURE
MECH DWG 1019901				A-23-202	1019977	K				1	1			73	1019977	STAR – HORIZ SIMULATOR
														72		
														71		
														70		
				A-23-114		A							1	69		CABLE, INTERCONNECT (NAA-P2 TO IMU)
														68		
														67		
				A-23-258		A						1		66	2900277-011	MOUNTING PLATE, COMPONENT
				A-23-167		A				1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
				A-23-080		A				1		1		64	1900926-021	ROTARY TABLE ASSY
														63		
														62		
						A				1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
						A				1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
				A-23-98		A			✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET
														58		
				A-23-105		A			✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
				A-23-094		A			✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
				A-23-104		A			✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
						A								54		
														53		
				A-23-108		A				1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
				A-23-206		A				1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
				A-23-107	1902046	A				1				50	1902046-021	REMOTE OPTICS CONTROLLER
				A-23-192	2900024	A				1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
				A-23-197		A					1			48	1900364-061*	BLANK PANEL ASSY.
				S-23-100		A			✓	1	1	1	1	47	2900060-011	INERTIAL COMP. TEMP. CONTROLLER
				A-23-103	2010602	A			✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY.
				H-23-207		M			✓				1	45	1021640	LIFTING SLING, G & N INST. QUAL. FIXT./AZ REF FIXT.
				C-23-411		A				1	1	1		44	1902134-021*	G&N COOLANT & POWER CONSOLE
				A-23-093		A				1	1			43	2900067-011	G&N MTG FIXTURE
				A-23-092		A				1	1			42	2900072-011	OPTICS MTG FIXTURE
				A-23-091		A				1		1		41	2900000-011	IMU MTG FIXTURE
				H-23-123		A			✓					40	1900010-021	IMU SHIPPING CONTAINER
				H-23-122		A			✓	1	1	1		39	1900009-031	TRANSPORTATION CART, G&N, ASSY.
				NA		A								38	2900022-011	OPTICS INERTIAL TEST SET
				C-23-404		A				1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYZER
1900000-011 USABLE				C-23-300		A				1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
				C-23-425	DWG	R				1				35		INTERCONNECT KIT, P & M
SEE NOTE 11				C-23-403	2014049	R		1	✓	1				34	2014049-011	COMP CALIB SYS CONSOLE
				C-23-501	TBA	R		1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE
				C-23-402	TBA	R		1		1	1			32	2014042-011	AGC TEST SET
														31		
				C-23-424	TBA	R		1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G&N
				C-23-423	DWG	R		1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS.
				A-23-081		R				1	1			28	2014014-011	DSKY MTG STAND
				H-23-190	DWG	R			✓	1	1			27	2014282-011	AGC HANDLING FIXTURE
				A-23-200		K				1	1		1	26	1019840	RETRO REFLECTING PRISM
				A-23-196		K	1			1	1		1	25	1019337	PORTABLE LIGHT ASSY
				C-23-393		K				1	1			24	1019769	SHAFT ACCURACY TESTER
				A-23-109	1019759	K				1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
				A-23-199		K			✓	1	1			22	1019758	TOOLING BAR ASSY.
				[illegible]	[illegible]	K								21	1019962-011	AUX PTF STAND
MECH DWG 1022903														20		
				H-23-199		K			✓					19		SHIPPING & STORAGE CONTAINER, OPT UNIT
				A-23-079		K			✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
				A-23-097		K							1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
MECH DWG 1022866	& 1022902			A-23-096		K							1	16		AZIMUTH REFERENCE FIXTURE
				A-23-111		K				1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY.
				A-23-110		K				2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY.
				A-23-077		K				1	1			13	1017376	WEDGE, VARIABLE DEVIATION
				A-23-067		K				1	1			12	1016951-011	ALIGNMENT MIRROR ASSY
MECH DWG 1019890				C-23-502	2010605	K	1							11	1016949-011	FUNCTIONAL TESTER ASSY.
														10		
				A-23-095	2010606	K	1							9	1016910-011	PRECISION TEST FIXTURE
				H-23-198		A				1	1	1		8	2900064-011	IMU LIFTING FIXTURE
				A-23-162		A							1	7	1021646	JUMPER BY-PASS ASSY. COOLANT FL.
										1	1	1		6	2900066-021	PTA/PEA MTG FIXT.
				H-23-192	DWG	R		1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
				C-23-401	2014048	R				1		1		4	2014048-011	COMP. SIMULATOR
						A			✓					3	2900999-011	CDU HANDLING FIXTURE BLK II/LEM
				H-23-187	SCD	R			✓					2	1006421	AGC SHIPPING CONTAINER
				H-23-188	SCD	R			✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

DOCUMENTS — QUANTITY REQUIRED — END ITEM

REPLACED With CHANGE (Computer Print out) By Rev BB

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900228	PTC INTERFACE BLK II/LEM	I, LEM
ND1021591	CTS-G & N INTERFACE	II, LEM
2900225	MECH. DIAG., TEST POINT ADAPTER	II, LEM
2014022	MECH. DIAG., AGC TEST SET	I, II, LEM
2014021	MECH. DIAG., AGC SIMULATOR	I, II, LEM
2014020	MECH. DIAG., AGC/CTS OPER. CONSOLE	I, II, LEM
2014019	MECH. DIAG., AUX. CALIB. SYS. CONSOLE	I, II, LEM
2014018	MECH. DIAG., AGC CALIB. SYS. CONSOLE	I, II, LEM
2900224	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/0, I/50
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	I/100, II, LEM
2900221	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	I/100
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	II, LEM
2900216	MECH. DIAG., OPTICS CONTROL	I/100, II
2900214	MECH. DIAG., GROUNDING	I/100, II
2900213	MECH. DIAG., GROUNDING	II, LEM
2900210	MECH. DIAG., AC POWER PROTECTION & POWER DIST.	I/100, II, LEM
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	I/100, II, LEM
2900206	MECH. DIAG., TEST SELECTOR	I/100, II, LEM
2900202	MECH. DIAG., TEST CONTROL	I/100, II
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900204	MECH. DIAG., TEMP MONITOR & CONTROL	FOR I/100 TESTING ONLY
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	I/100, II, LEM
2900203	MECH. DIAG., TEMP MONITOR & CONTROL PANEL	II, LEM
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	I/100, II, LEM
2900219	MECH. DIAG., COUNTER SIGNAL COLLECTION	I/100, II, LEM
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	I/100, II, LEM
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	I/100, II, LEM
2900215	MECH. DIAG., MEASUREMENTS REF. POWER SUPPLIES	I/100, II, LEM
2900212	MECH. DIAG., PIP & IRIG MONITORING	I/100, II, LEM
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	I/100, II, LEM
2900205	MECH. DIAG., PORT TEMP CONTROLLER	I/100, II, LEM
2900207	MECH. DIAG., MONITOR PANEL	I/100, II, LEM
2900201	MECH. DIAG., TEST CONTROL PANEL	II, LEM
2900200	MECH. DIAG., GYRO CAGING PANEL	I/100, II, LEM

MISCELLANEOUS DOCUMENTS

THIS SHEET ADDED

BLOCK II

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN µf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN R.A. Jones 5-19-65
CHECKED 5/18/65
APPROVED
APPROVED 5/18/65
APPROVED MIT
APPROVED MSC 6/3/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 4 OF 7

1900030 BB

AC ELECTRONICS

ITEM NO.	CAPI- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1030	05	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	PART OF 1901930
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	PART OF 1901930
1077	1	2 4	1902195-021	GSE PSA J-BOX	PART OF 1901930
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	051	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	2L	4 8	1902046-021	REMOTE OPTICS CONTROLLER	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

	DOCUMENTS						QUANTITY REQUIRED											END ITEM		
NOTES	MISC	MANUAL	ND		MODEL NO.	PS	PC				471	461	451	441	431	421	411	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
														1	1	1		88	2900066-021	PTA/PEA MTG FIXT.
							A						✓					87	6900129-011	FIXT., HANDLING, LEM PSA
					A-23-256		A							1	1	1		86	2900145-011	PTA/PEA TEST POINT ADAPTER
					A-23-255		A							1	1	1		85	2900066-011	PTA/PEA MTG FIXTURE
					A-23-409		R							1	1	1		84	2014059-011	AGC AUX CALIB. SYS. CONSOLE
							K				1		✓	1	1		1	83		CONNECTOR COVERS, OPTICS
							A							1	1	1		82		CABLE BREAK-OUT BOXES
					S-23-105		A										1	81	2900063-011	LIFTING TEMP. CONTROLLER
																		80		
							K				1							79	6014003	AOT TESTER
MECH. DWG G014001					H-23-205		K						✓					78		AOT PURGE VALVE COVERS
					S-23-104		K						✓				1	77	1019984-011	OPTICS CLEANING KIT
							A						✓	1	1	1	1	76	6900001-011	CONNECTOR COVERS
					A-23-112		K						✓				1	75		OPTICS COVER, AOT
							R					1	✓	1	1		1	74		CONNECTOR COVERS, LGC SUBSYS.
																		73		
																		72		
																		71		
																		70		
					A-23-114		A										1	69		CABLE, INTERCONNECT
																		68		
																		67		
																		66		
					A-23-167		A							1	1	1		65	2900037-011*	PSA TEST POINT ADAPTER
					A-23-080		A							1		1		64	1900926-021	ROTARY TABLE ASSY
																		63		
																		62		
							A							1		1		61		HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
							A							1	1			60		HOSE SET, GSE COOLANT INTERCONN, G & N
					A-23-98		A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB. SET
																		58		
					A-23-105		A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
					A-23-094		A						✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
					A-23-104		A						✓	1	1	1	1	55	1900802-011	IMU SNAP-ON BELLOWS
																		54		
															1	1		53	6900043-011	CABLE SET, INTERCONNECT
					A-23-108		A							1	1	1		52	2900025-011*	CABLE KIT, INTERCONNECT
					A-23-206		A							1	1	1		51	2900070-011	FIXTURE, MOUNTING, SUBSYS.
					A-23-257		A									1		50	6900007-011	MOUNTING PLATE, COMPONENT
					A-23-102		A							1	1	1		49	2900024-011*	GUIDANCE DIST. BOX
					A-23-197		A								1			48	1900364-061*	BLANK PANEL ASSY
					S-23-100		A						✓	1	1	1	1	47	2900060-011	INERTIAL COMP TEMP CONTROLLER
					A-23-103		A						✓	1	1	1	1	46	1900299-021	DEGAUSSER ASSY
																		45		
					C-23-411		A							1	1	1		44	1902134-021*	G & N COOLANT & POWER CONSOLE
																		43		
																		42		
					A-23-091		A							1		1		41	2900000-011	IMU MTG FIXTURE
					H-23-123		A						✓					40	1900010-021	IMU SHIPPING CONTAINER
					H-23-122		A						✓	1	1	1		39	1900009-031	TRANSPORTATION CART G & N ASSY
					NA		A											38	2900022-011	OPTICS INERTIAL TEST SET
					C-23-404		A							1	1	1		37	2900023-011*	OPTICS INERTIAL ANALYSER
					C-23-500		A							1	1	1		36	1900000-021*	OSCILLOGRAPH CONSOLE
							R							1				35	2014064-011	INTERCONNECT KIT, P & M
					C-23-403		R					1		1	1	1		34	2014049-011	COMP CALIB SYS CONSOLE
					C-23-501		R					1		1				33	2014024-011	AGC/CTS OPERATION CONSOLE
					C-23-402		R					1		1	1			32	2014042-011	AGC TEST SET
																		31		
					C-23-424		R					1		1	1			30	2014255-011	AGC GSE INTERCONNECT KIT G & N
					C-23-423		R					1		1				29	2014268-011	AGC GSE INTERCONNECT KIT SUB-SYS
																		28		
					H-23-190		R						✓					27	2014282-011	AGC HANDLING FIXTURE
																		26		
																		25		
																		24		
																		23		
																		22		
																		21		
																		20		
MECH. DWG G014002					A-23-128		K						✓					19	6014000	LEM AOT SHIPPING CONTAINER
					A-23-079		K						✓					18	1017447	THEODOLITE & SUPPORT ASSY
																		17		
																		16		
																		15		
																		14		
																		13		
																		12		
																		11		
																		10		
																		9		
					H-23-198		A							1	1	1		8	2900064-011	IMU LIFTING FIXTURE
					A-23-162		A										1	7		JUMPER BY-PASS ASSY COOLANT FL.
																		6		
					H-23-192		R					1		1				5	2014013-011	AGC UNIV DSKY HANDLING FIXTURE
					C-23-401		R							1		1		4	2014048-011	COMP SIMULATOR
																		3		
					H-23-187		R						✓					2	1006421	AGC SHIPPING CONTAINER
					H-23-188		R						✓					1	1006422	AGC UNIV DSKY SHIPPING CONTAINER

NOTES:
1. 411 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING
2. 421 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING
3. 431 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING
4. 441 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G & N)
5. 451 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.
6. 461 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS TESTING)
7. 471 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.
8. LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF OPTICS INERTIAL TEST SET
9. THIS DRAWING DENOTES "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.
10. THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AL		SHEET ADDED PER TDRR 19719	F.P.G.		5-17-65	WK
AM		REVISED PER TDRR 21939	F.P.G.		8-18-65	
AN		REVISED PER TDRR 23280	F.P.G.		10-15-65	WK
AP		REVISED PER TDRR 23537	F.P.G.		11-1-65	WK
AR		REVISED PER TDRR 25028	JEF		1-4-66	WK
AS		REVISED PER TDRR 25330	JEF		1-17-66	WK
AT		" " " 27541	RAJ		6-30-66	
AU		" " " 27716	"		"	
AV		" " " 28561	"		"	
AW		" " " 28560	"		"	
AY		" " " 28997	"		7-1-66	
AZ		" " " 28996	"		"	
BA		" " " 29234	"		"	
BB		REPLACED " " 29695	"		"	

REPLACED With Change (Computer Printout) By Rev. BB

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
2900228	PTC INTERFACE BLK II/LEM	II, LEM
ND1021591	CTS-G & N INTERFACE	
2900225	MECH. DIAG, TEST POINT ADAPTER	
2900222	MECH. DIAG., PSA ADAPTER MODULE TESTER	
2900220	MECH. DIAG., PSA ADAPTER MODULE (CARRY-ON)	
6014010	MECH. DWG, LEM AOT PROTECTIVE COVERS	
2900213	MECH. DIAG., GROUNDING	
2900210	MECH. DIAG., AC POWER PROTECTION & POW. DIST.	
2900209	MECH. DIAG., COMPUTER SIMULATOR INTERFACE	
2900206	MECH. DIAG., TEST SELECTOR	
2900021	APOLLO GSE FAMILY TREE, BLOCK II/LEM	
2900211	MECH. DIAG., AUX. INPUT-OUTPUT	
2900203	MECH. DIAG., TEMP MONITOR & CONTROL	
2900223	MECH. DIAG., GIMBAL POSITION CONTROL PANEL	
2900219	MECH. DIAG., COUNTER SIGNAL SELECTION	
2900218	MECH. DIAG., OSCILLOGRAPH SIGNAL SELECTION	
2900217	MECH. DIAG., SIGNAL SELECTION & MEASUREMENT	
2900215	MECH. DIAG., MEASUREMENT REF. POWER SUPPLIES	
2900212	MECH. DIAG., PIP & IRIG MONITORING	
2900208	MECH. DIAG., POWER & DUMMY LOAD PANEL	
2900207	MECH. DIAG., MONITOR PANEL	
2900205	MECH. DIAG., PORTABLE TEMP CONTROLLER	
2900201	MECH. DIAG., TEST CONTROL PANEL	
2900200	MECH. DIAG., GYRO CAGING PANEL	

MISCELLANEOUS DOCUMENTS

THIS SHEET ADDED

LEM

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN 5-13-65
CHECKED 5/18/65
APPROVED
APPROVED 5/18/65
APPROVED MIT 2 June 65
APPROVED MSC 6/2/65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE —
SHEET 5 OF 7

AC ELECTRONICS

ITEM NO.	CAPI- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1170	05	234	1900145-011	G+N COOLANT + PWR CONSOLE	
1171	051	234	1902134-011	G+N COOLANT + PWR CONSOLE	PART OF 1901930
1172	051	234	1902134-021	G+N COOLANT + PWR CONSOLE	PART OF 1901930
1173	12LR	234	1902134-031	G+N COOLANT + PWR CONSOLE	PART OF 1901930
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCONN.	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE ISS/OSS	
1200	051	34	1900876-011	HOSE SET,GSE COOLANT INTERFACE G+N	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLES	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1071 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1071 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1320	L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1321	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1330	2	1	2900863	CABLE ASSY W-198	NAA INSTALL. CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL SET	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	2L	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	

NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21930	8-18-65	
AN	REVISED PER TDDR 23280	10-18-65	WK
AP	REVISED PER TDRR 23537	11-1-65	WK
AR	REVISED PER TDRR 25028	-4-66	WK
AS	REVISED PER TDRR 25330		WK
AT	" " " 2754	6-30-66	
AU	" " " 27716	"	MGM
AV	" " " 28561	"	MGM
AW	" " " 28560	"	MGM
AY	" " " 28997	"	MGM
AZ	" " " 28996	7-1-66	MGM
BA	" " " 29234	"	MGM
BB	REPLACED " " 29695	"	MGM

NOTES:
1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB)
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ACSP), 8104002 (RAY), 8106001 (KIC)
3. INCORPORATED IN P/N 1901875-011 & 1901876-011
4. EFF (S/N) FOLLOWED BY * ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.
5. P/N 1902299-011 REPLACES P/N 1900740-011 AND P/N 1901308-011.
6. + THREE (3) NEW BUY OIA'S BUILT TO I/O CONFIGURATION AND RETROFITTED IN LINE.

	CONFIGURATION IV			CONFIGURATION III			CONFIGURATION II			CONFIGURATION I				
	CAPABILITY L 2 1 5 0	EFF. S/N	END ITEM P/N	CAPABILITY L 2 1 5 0	EFF. S/N	END ITEM P/N	CAPABILITY L 2 1 5 0	EFF. S/N	END ITEM P/N	CAPABILITY L 2 1 5 0	EFF. S/N	END ITEM P/N	ITEM	NOMENCLATURE OR DESCRIPTION
													70	
													69	
													68	
													67	
													66	
													65	
													64	
													63	
													62	
													61	
													60	
													59	
										X	1	6900129-011	57	FIXT, HANDLING, LEM PSA
										X	1-	6900043-011	55	CABLE SET, INTERCONNECT
										X	1-	2900677-011	54	MOUNTING PLATE; COMPONENT
CONFIG V & UP				X		1902195-021	X		1901933-031	X	1-	1902195-011	53	GSE PSA J-BOX
SEE NOTE 3										XX		1901663-021	52	PLASTIC TUBING
SEE NOTE 3										XX		1900866-021	51	HOSE, COOLANT INTERCONNECT M-F
SEE NOTE 3										XX		1900867-021	50	HOSE, COOLANT INTERCONNECT F-F
				X		6900001-011	X		2900065-011	X		1902430	49	CONNECTOR COVERS (ISS)
				XXXXX		1900009-031	XXX	11-	1900009-021	X	2-10	1900009-011	48	TRANSPORTATION. CART G & N ASSY
							XX	15-	1900010-021	XXX	1-14	1900010-011	47	IMU SHIPPING CONTAINER
				XXX	15-	1901846-031	XXX	7-14	1901846-021	XX	1-6	1901846-011	46	G & N HARNESS HANDL. & SHIPPING FIXT.
													45	
										XX	1-	2900060-011	44	PORTABLE TEMP. CONTROLLER
										XX	1-	2900145-011	43	PTA/PEA TEST POINT ADAPTER
							XX	20-	2900066-021	XX	1-19	2900066-011	42	PTA/PEA MTG FIXTURE
													41	CABLE BREAK-OUT BOXES
										XX	1-	2900070-011	40	FIXTURE, MOUNTING, SUBSYS.
										XX	3-	2900024-011	39	GUIDANCE DIST. BOX
							XXX		1902625	XXX	1-	1901520-011	38	CABLE INTERCONNECT (NAA-P2 TO IMU) W103
				XX		1902046-021	X	1-	1902046-011	XX	2-9	1900491-011	37	REMOTE OPTICS CONTROLLER
										XX	1-	2900063-011	36	LIFTING TEMP CONTROLLER
							XX		1901492-021	XX	1-	1901492-011	35	AUXILIARY BATTERY PACK
							XXX	15-	1900342-021	XXX	2-14	1900342-011	34	INERTIAL COMP TEMP CONTROLLER
SEE ITEM 53 FOR CONT	X	1-2	1901933-011	XX	3-12*	1900268-031	X	3-12*	1900268-021	X	3-12	1900268-011	33	GSE PSA J-BOX
				X		1900797-031	XX		1900797-021	X	1-	1900797-011	32	LOAD & SIGNAL SIMULATOR SET
							XX	7-	1900299-021	XXX	1-6	1900299-011	31	DEGAUSSER ASSY
										XXXX	1-	1900804-011	30	IMU PRESSURE SEAL TESTER
							XXXXX	6-	1902371-011	XX	1-5	1900803-011	29	FILLING & PURGING FIXT.
										XXX		1015419	28	JUMPER BY-PASS ASSY, COOLANT FL.
										XXXX	1-	1900802-011	27	IMU SNAP-ON BELLOWS
										XXX	1-	1900800-011	26	IMU MTG ALIGN CALIB. TOOL SET
										XXXX	1-	1900810-011	25	ROTARY TABLE CALIB. SET
							XXX	12-	1900926-021	XX	1-11	1900926-011	24	ROTARY TABLE ASSY
										XXX	1-13	1901426-011	23	NAV BASE/OPT ASSY HAND & INST FIXT.
	X		TBA	X		TBA	X		1902431-021	XX		1902431-011	22	PSA ADAPTER MODULE
							XXX	15-	1900606-021	X	3-14	1900606-011	21	PSA MTG FIXTURE
				X	10-	2900067-011	XXX	2-9*	1902204-011	X	2-9	1900014-011	20	G & N MTG FIXTURE
				X	2-9*	2900072-011	XXX	2-9*	1902301-011	XX	2-9	1900013-011	19	OPTICS/NAV BASE MTG FIXTURE
										XXX	1-	1015462	18	IMU LIFTING FIXTURE
							XX	1-	2900000-011	XXX	3-16	1900012-011	17	IMU MTG FIXTURE
SEE NOTE 3										XX		1901663-011	16	TUBING, PLASTIC
SEE NOTE 3										XX		1900866-011	15	HOSE COOLANT INTERCONNECT M-F
SEE NOTE 3										XX		1900867-011	14	HOSE COOLANT INTERCONNECT, F-F
										XXX		1901876-011	13	HOSE SET, GSE COOLANT INTERCONN, G & N
										XXX		1901875-011	12	HOSE SET, GSE COOLANT INTERCONN, ISS/OSS
SEE NOTE 5										XX	1-15	1901308-011	11	GSE TO G & N INTERCONNECT CABLES
SEE NOTE 5										XX	1-15	1900740-011	10	GSE TO GSE INTERCONNECT CABLES
SEE NOTE 5							XX	16-	2900025-011	XXX	1-15	1902299-011	9	CABLE SET INTERCONNECT
										XXX	3-17	1900805-011	8	PSA TRAY EXTENDER SET
				XX	18-	2900037-011	XXX	15-17	1901981-011	X	2-3,5-14	1900931-011	7	PSA TEST POINT ADAPTER
				XXX	15-17	1901959-011	XX	3-14*	1900433-021	X	3-14	1900433-011	6	GSE J-BOX OVERHEAD
				X	7-	1902134-021	XXX	15-16	1902134-011	X	3-14	1900145-011	5	G & N COOLANT & POWER CONSOLE
							XXXXX	15-	1900000-021	XXXXX	3-14	1900000-011	4	OSCILLOGRAPH CONSOLE
										XXXXX	1-	1900364-061	3	BLANK PANEL ASSY
	XXX	18-	2900023-011	XXX	3-17+	1901976-011	XX	3-14*	1900004-021	X	3-14	1900004-011	2	OPTICS INERTIAL ANALZER
	XX		2900022-011	X		1902300-011	X	15-17	1900005-021	X	3-14	1900005-011	1	OPTICS INERTIAL TEST SET

AM

THIS SHEET ADDED

REPLACED With Change (Computer Printout) By Rev. BB

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN F.P. DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C. Sparling
NASA APPROVAL
MIT APPROVAL McMurtry 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE ——
WT
SHEET 6 OF 7

AC ELECTRONICS

ITEM NO.	CAPI- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1430	0	34	1900014-011	G+N MTG.FIXTURE	
1431	051	34	1902204-011	G+N MTG.FIXTURE	
1432	2L	34	2900067-011	G+N MTG. FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL. FIXTURE	
1460	05	1 5	1901846-011	G+N HANDLING + SHIPPING FIXTURE	
1461	051	1 5	1901846-021	G+N HANDLING + SHIPPING FIXTURE	
1462	051	1 5	1901846-031	G+N HANDLING + SHIPPING FIXTURE	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G+N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G+N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G+N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	L	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING + PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING + PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD + SIGNAL SIMUL. SET	
1581	051	5	1900797-021	LOAD + SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD + SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	2LR	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	1	1	1902431-031	PSA ADAPTER MODULE	
1603	2	1	2901143-011	PSA ADAPTER MODULE(BLK II)	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING FIXTURE	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12L	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION + TEST ASSY SCM/PSAAM	

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REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
AM	SHEET ADDED PER TDRR 21939	8-18-65	
AN	REVISED PER TDRR 23280	10-13-65	W/C
AP	REVISED PER TDRR 23537	10-28-65	W/C
AR	REVISED PER TDRR 25028	1-4-66	W/C
AS	REVISED PER TDRR 25330		W/C
AT	" " " 27541	6-30-66	
AU	" " " 27716	"	
AV	" " " 28561	7-1-66	
AW	" " " 28560	"	
AY	" " " 28997	"	
AZ	" " " 28996	"	
BA	" " " 29234	"	
BB	REPLACED " " 29695	"	

NOTES:

1. THE PURPOSE OF SHEETS 6 & 7 OF THIS DRAWING IS TO SHOW GSE END ITEM CONFIGURATION AND CAPABILITY BY PART NUMBER AND SERIAL NUMBER AS DESIGNED (I.E. AS APPROVED AND RELEASED BY CCB).
2. FOR END ITEMS THAT HAVE BEEN RETROFITTED SEE DRAWINGS 1021201 (ASCP), 8104002 (RAY), 8106001 (KIC).
3. EFF (S/N) FOLLOWED BY AN ASTERISK (✱) ARE OBTAINED BY RETROFIT. NO NEW BUY TO THIS CONFIGURATION.

CONFIGURATION IV EFF S/N	CONFIGURATION IV END ITEM P/N	CONFIGURATION III EFF S/N	CONFIGURATION III END ITEM P/N	CONFIGURATION II EFF S/N	CONFIGURATION II END ITEM P/N	CONFIGURATION I EFF S/N	CONFIGURATION I END ITEM P/N	ITEM	NOMENCLATURE OR DESCRIPTION
						1-	2900863	137	CABLE ASSEMBLY - W198
						1-	2900858	136	CABLE ASSEMBLY - W193
						1-	1902602	135	CABLE, SPECIAL PURPOSE - W111
								134	
								133	
								132	
						1-36	1022880	131	SCT/SXT LENS COVERS
								130	AOT LENS COVERS
								129	AOT PURGE VALVE COVERS
								128	OUA PURGE VALVE COVERS
						1-37	1022970-011	127	CONNECTOR COVERS (OPTICS)
							6014000	126	LEM AOT SHIPPING CONTAINER
						1-3	1019721	125	CASE ASSY, STORAGE MAP & DATA VIEWER
						1-5	1019700	124	SHIPPING & STORAGE CONT. OPT UNIT (INTERIM)
				9-	*1019720-011	1-13	1019720	123	OPTICS-NAV BASE SHIPPING CONTAINER
						1-7	1019984-011	122	OPTICS CLEANING KIT
						1-8	1019926-011	121	G & N FIXTURE STAND
						1-7	1019970-011	120	STAR-HORIZON SIMULATOR CERT. FIXT.
						1-8	1019977	119	STAR-HORIZON SIMULATOR
						1-3	1016948	118	TESTER ASSY, MAP & DATA VIEWER
						1-7	1019840	117	RETROREFLECTING PRISM
						1-9	1019837	116	PORTABLE LIGHT ASSY
						1-9	1017376	115	WEDGE, VARIABLE DEVIATION
						1-5	1019759	114	ADJ MIRROR & PEDESTAL ASSY
						1	1019758	113	TOOLING BAR ASSY
						1-7	1017447	112	THEODOLITE & SUPPORT ASSY
							1021640	111	LIFTING FIXT., G&N INST. QUAL/AZ REF FIXT.
						1-3	1019760	110	G & N REFERENCE CERTIFICATION FIXT.
						1-3	1017383	109	G & N INSTALL. QUALIFICATION FIXT.
					1017382-011	1-5	1017382	108	AZIMUTH REFERENCE FIXT.
						1-12	1017381	107	45° AUTOCOLLIMATOR PLATE ASSY
						1-22	1017380	106	0° AUTOCOLLIMATOR PLATE ASSY
				6-	1017387-011	1-5	1017387	105	ALIGNMENT MIRROR CERTIFICATION FIXT
				6-	1016951-011	1-5	1016951	104	ALIGNMENT MIRROR ASSY
						1-	6014003	103	AOT TESTER
						1-3	1019769	102	SHAFT ACCURACY TESTER
				3-	1016949-011	1-2	1016949	101	FUNCTIONAL TESTER ASSY
					1022942-011✱	1-3	1022942-000	100	PTF CALIBRATION KIT
						1-4	1019962-011	99	AUX PTF STAND
				3-	1016910-011	1-2	1016910	98	PRECISION TEST FIXTURE
								97	
								96	
								95	
								94	
								93	
								92	
						1-32	2014013-011	91	AGC UNIV. DSKY HANDLING FIXTURE
							1006422	90	AGC UNIV. DSKY SHIPPING CONTAINER
						1-22	1020338	89	AGC MOUNTING KIT
						1-22	1020339	88	AGC MOUNTING KIT
						1-20	1020423	87	CONNECTOR COVERS (AGC)
						1-20	1006231	86	AGC NAV DSKY SHIPPING CONTAINER
						1-20	1006229	85	AGC MAIN DSKY SHIPPING CONTAINER
				21-	1006421	1-20	1006230	84	AGC SHIPPING CONTAINER
						1-25	1014334	83	AGC NAV DSKY HANDLING FIXTURE
						1-26	1014377	82	AGC MAIN DSKY HANDLING FIXTURE
			2014282-011		1020001-003	1-22	1020001	81	AGC HANDLING FIXTURE
						1-4	1020225	80	FIXTURE ASSY, ALIGN AGC NAV DSKY
							1020393	79	INTERCONNECT KIT, P&M
				16-22	2014255-011	3-15	1020313	78	AGC GSE INTERCONNECT KIT, G & N
				10-13	2014268-011	3-9	1020312	77	AGC GSE INTERCONNECT KIT, SUB-SYS
		1-11	2014014-011	10-11	1020343	1-9	1020195	76	MAIN DSKY MTG STAND
		10-13	2014024-011	9	1020342	1-8	1014465	75	AGC/CTS OPERATION CONSOLE
						1-9	2014059	74	AUX CALIB SYS CONSOLE
		7-9	2014049-011	1-6	*1020344-011	1-6	1014217	73	COMP CALIB. SYS CONSOLE
		20-26	2014042-011	17-19	1020341	3-16	1014156	72	AGC TEST SET
		16-27	2014048-011	12-15	1014061-011	3-11	1014061	71	COMP SIMULATOR

NOTES

L 2 1 5 0 CAPABILITY

Ⓐⓜ THIS SHEET ADDED

REPLACED With CHANGE (Computer Printout) By Rev BB

EFFECTIVITY & CAPABILITY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
1000000	

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN F. P. Busco DATE 8-12-65
CHECKED 8-24-65
APPROVAL
APPROVAL C Sporling
NASA APPROVAL
MIT APPROVAL McNeale, 8-25-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
NASA DRAWING NO. 1900030
SCALE —
WT
SHEET 7 OF 7

1900030 BB

315567

APPENDIX I

GSE ITEMS USED OUTSIDE G+N LAB

ITEM NO.	CAPA- BILITY 0512L	PART NUMBER	TITLE	MODEL NO.
01	0512	1017383-011	G+N INSTALL. AND QUAL. F [illegible]	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.+AZ.REF.([illegible] T)	H-23-207
03	0512	1017447-011	THEODOLITE + SUPPORT ASS [illegible]	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAI [illegible]	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	H-23-128(GAEC LSC 420-11075)
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	(PART OF ITEM 14)
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	S-23-114(GAEC LSC 410-31058)
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019540	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING + INSTALL.FIXT.	H-23-193
30	051	1901846-031	G+N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM PART OF ITEM 19 LTC GAEC LSC 410-31090
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END ITEM PART OF ITEM 9
43	12	2901075-011	BREAKOUT BOX + ADAPTER SET BASIC	A-23-300

APPENDIX I

GSE ITEMS USED OUTSIDE G+N LAB

ITEM NO.	CAPA-BILITY 0512L	PART NUMBER	TITLE	MODEL NO.
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	GAEC LSC 410-31080
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORGUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

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        NOTES

         I  GLOSSARY OF SYMBOLS

          A.  CAPABILITIES

            0 = BLOCK I SERIES 0
            5 = BLOCK I SERIES 50
            1 = BLOCK I SERIES 100
            2 = BLOCK II
            L = LEM
            R = LORS
           X = OBSOLETE DESIGN FOR COLUMN INDICATED


         B.  TEST CONFIGURATION

            1 = POST INSTALLATION
            2 = ISS INERTIAL SUB-SYSTEM TEST
            3 = G+N TEST
            4 = UNIVERSAL TEST STATION
            5 = G+N SUPPORT EQUIPMENT
            6 = CSS COMPUTER SUB-SYSTEM TEST
            7 = R+I (RECEIVING + INSPECTION - OPTICS)
            8 = OSS OPTICAL SUB-SYSTEM TEST
```

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL

REV STATUS OF SHEETS	REV	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC	BC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PURK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 13

17A6 12-65

GLOSSARY

ITEM NO. | CAPA- BILITY 0512LR | PART NUMBER | TITLE | MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BC | SHEET 2 of 13

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	0512	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BC | SHEET 3 of 13

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BC | SHEET 4 of 13

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	512L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.KIT SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.KIT S/S	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.KIT SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. KIT SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE NONE | REV LTR BC | SHEET 5 of 13

RAYTHECN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	5	5	2014282-011	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BC	SHEET 6 of 1[illegible]

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1030	05	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	PART OF 1901930
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	PART OF 1901930
1077	1	2 4	1902195-021	GSE PSA J-BOX	PART OF 1901930
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BC	SHEET 7 of 1[illegible]

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	051	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	2L	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1172	051	234	1902134-021	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1900876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1071 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1071 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BC	SHEET 8 of 1[illegible]

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1320	L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1321	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1330	2	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	2L	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1432	2L	34	2900067-011	G&N MTG, FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BC	SHEET 9 of 1[illegible]

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	L	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	051	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	2LR	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	1	1	1902431-031	PSA ADAPTER MODULE	
1603	2	1	2901143-011	PSA ADAPTER MODULE(BLK II)	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 10 of 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12L	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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SCALE-NONE	REV LTR BC	SHEET 11

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&A7.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2015318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019640	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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SCALE-NONE	REV LTR BC	SHEET 12 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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SCALE-NONE	REV LTR BC	SHEET 13

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
		BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
1000000		BD	REVISED PER TDRR 30095	10 OCT 66	JJ

REV STATUS OF SHEETS	REV	BD	BC	BC	BC	BC	BC	BC	BC	BD	BD	BD	BC	BC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER GPUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 13

MIL 1377A6 12-65

GLOSSARY

ITEM NO. | CAPA-BILITY 0512LR | PART NUMBER | TITLE | MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2~~1~~ of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	0512	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 3~~2~~ of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 4~~3~~ of 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	512L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.KIT SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.KIT S/S	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.KIT SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. KIT SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 5~~4~~ of 13

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	5	5	2014282-011	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BC	SHEET 6~~8~~ of 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1030	05	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	PART OF 1901930
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	PART OF 1901930
1077	1	2 4	1902195-021	GSE PSA J-BOX	PART OF 1901930
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BC	SHEET 7~~6~~ of 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	051	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	2L	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1172	051	234	1902134-021	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1900876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1071 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1071 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BC	SHEET 8~~7~~ of 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1320	L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1321	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1330	2	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900900-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	2L	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2L	34	2900067-011	G&N MTG, FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BD	SHEET 9 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	L	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/FTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900603-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	051	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	2LR	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	1	1	1902431-031	PSA ADAPTER MODULE	

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SCALE-NONE | REV LTR BD | SHEET 10 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1603	2	1	2901143-011	PSA ADAPTER MODULE(BLK II)	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12L	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&A7.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2015318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019640	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	16 SEP 66	JJJ
BE	*REVISED PER TDRR 30806*	7 NOV 66	JRK

REV STATUS OF SHEETS	REV	BE	BC	BC	BC	BC	BC	BC	BE	BE	BE	BE	BE	BE
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUHK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 13

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BC		SHEET 2 of 13

KULLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	0512	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BC		SHEET 3 of 13

KULLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BC		SHEET 4 of 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	512L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.KIT SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.KIT S/S	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.KIT SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. KIT SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BC		SHEET 5 of 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	5	5	2014282-011	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1030	05	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	PART OF 1901930
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	PART OF 1901930
1077	1	2 4	1902195-021	GSE PSA J-BOX	PART OF 1901930
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	051	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER.	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1131	51	234	1900805-021	TRAY EXTENDER SET	
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	2L	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1172	051	234	1902134-021	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	PART OF 1901930
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET.GSE COOLANT INTERFAC	
1200	051	34	1900876-011	HOSE SET.GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE.SET.INTERCONN.. BASIC	
1241	12L	234 8	2900025-011	CABLE.SET.INTERCONN..BASIC	
1242	12LR	234 8	2900025-021	CABLE.SET.INTERCONN..BASIC	
1243	12LR	234 8	2900025-031	CABLE.SET.INTERCONN..BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1071 TO 1075 SEE ITEMS 1071 TO 1075.

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SCALE-NONE
REV LTR BE
SHEET 8 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET.INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET.INTERCONN LEM	
1302	L	234	6900043-021	CABLE SET.INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1320	L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1321	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1330	2	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE.SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE.MTG.SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE.MTG.SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB.MTG.FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB.MTG.FIXTURE	
1422	2L	34 8	2900072-011	OPTIC/NB.MTG.FIXTURE	
1430	0	34	1900014-011	G&N MTG.FIXTURE	
1431	051	34	1902204-011	G&N MTG.FIXTURE	QUAL TEST CHANGE (FCP-270)

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1433	1	34	1902204-021	G&N MTG. FIXTURE	
1436	2L	34	2900067-011	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-27C)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART.G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART.G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART.G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE.PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE.CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	L	2 4	2900677-011	MTG PLATE.COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE.COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE.COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	051	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 10 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1600	2LR	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	1	1	1902431-031	PSA ADAPTER MODULE	
1603	2	1	2901143-011	PSA ADAPTER MODULE(BLK II)	
1604	1	1	6900028-011	PSA ADAPTER MODULE(LEM)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12L	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-166
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-165
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

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SCALE-NONE	REV LTR BE	SHEET 12 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-165
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 ETC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE.LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH.TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE.AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE.AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE.AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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SCALE-NONE	REV LTR BE	SHEET 13 OF 13

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.

REV STATUS OF SHEETS													
REV	BF	BC	BC	BC	BF	BF	BF	BF	BF	BF	BF	BE	BE
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS.

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 13

ML 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

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SCALE-NONE	REV LTR BC	SHEET 2 ~~1~~ of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	0512	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BC	SHEET 3 ~~2~~ of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	USE WITH FUNCTIONAL TESTER
370	5	7	1022934-011	CABLE ASSY W-17	

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
591	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM C670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	PART OF ITEM 0700
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	PART OF 1901930
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX.	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM7P	

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
	APPENDIX			
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

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APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BE
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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE.LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH.TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE.AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE.AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE.AGC UNIVERSAL	H-23-251

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SCALE-NONE
REV LTR BE
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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	*REVISED PER TDRR 30806*	9 NOV 66	JRK
BF	*REVISED PER TDRR 30985*	7 NOV 66	JRK.
BG	*REVISED PER TDRR 31329*	9 NOV 66	JRK

REV														
SHEET														
REV STATUS OF SHEETS	REV	BG	BC	BC	BC	BF	BF	BF	BF	BF	BG	BE	BE	BE
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A

CODE IDENT. NO 80230

1900030

SCALE NONE

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MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2 of 13

KULLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	0512	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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SCALE-NONE	REV LTR BC	SHEET 3 of 13

KULLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 4 of 13

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014046-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

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SCALE-NONE	REV LTR BF	SHEET 5 OF 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670.PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670.PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER. UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT..UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900900-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900900-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900510-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	SEE DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900958	CABLE ASSY W 192	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900963	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900313-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	

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REV LTR BF
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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (FCP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (FCP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/FTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BG	SHEET 10 of 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BG	SHEET 11 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&A7.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-165
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	05121	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 ETC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE.LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH.TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE.AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE.AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE.AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
		BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
1000000		BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
		BE	*REVISED PER TDRR 30806*	7 NOV 66	JRK
		BF	*REVISED PER TDRR 30985*	7 NOV 66	JRK.
		BG	*REVISED PER TDRR 31329*	9 NOV 66	JRK
		BH	*REVISED PER TDRR 31492*	11 NOV 66	JRK

REV															
SHEET															
REV STATUS OF SHEETS	REV	BH	BC	BH	BC	BF	BF	BF	BF	BF	BG	BG	BE	BE	
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 13

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2 of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BH	SHEET 3 of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 4 of 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014046-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 5 OF 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670.PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670.PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 6 of 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LP	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LP	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LP	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 7 of 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 8 of 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W193	NAA P2-IMU
1320	2L	1	2900958	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 9 of 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1438	12	34	2900067-031	G&N MTG. FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BG	SHEET 10 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900068-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BG	SHEET 11 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-165
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900068-011	PSA ADAPTER MODULE.LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH.TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE.AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE.AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE.AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2 ~~1~~ of 13

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE	
11	0512	7	1016910-011	PRECISION TEST FIXTURE	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX12	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XX12	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	C512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-000	AOT TESTER	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX2	7	1017387-000	ALIGNMENT MIRROR ASSY CERT. F	
81	051	7	1017387-011	ALIGNMENT MIRROR ASSY CERT. F	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX12		1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	G&N REF.CERT.FIXTURE	
140	C512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	
191	0512	5	1019837-011	PORTABLE LIGHT ASSEMBLY	
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BH	SHEET 3 OF 13

FORM 2-64 9-65

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	0512	8	1019977-021	STAR & HORIZON SIMULATOR	
230	05XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT	
231	.12L	5	1019970-021	STAR & HORIZON SIMULATOR CERT	
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	1	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	OBSOLETE
261	0512		1019720-011	OPTICS N/B SHIPPING CONT.	OBSOLETE
262		5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	L	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT LENS COVERS	
310	0512	5	1022980-011	SCT/SXT LENS COVERS	
320	L	5	6014319	CONNECTOR COVERS AOT	
330	51	1	1022963-011	STAR TRACKER COVERS	DELETED SEE ITEM 360
340	0512	1	1001844-004	SYSTEM CONN. COVERS	DELETED SEE ITEM 360
350	0512	1	1001844-005	SYSTEM CONN. COVERS	
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 4 ~~3~~ of 13

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	C51	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	C51	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014C49-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR RF	SHEET 5 OF 13

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	*REVISED PER TDRR 30806*	7 NOV 66	JRK
BF	*REVISED PER TDRR 30985*	7 NOV 66	JRK.
BG	*REVISED PER TDRR 31329*	9 NOV 66	JRK
BH	*REVISED PER TDRR 31482*	11 NOV 66	JRK
BJ	*REVISED PER TDRR 31534*	11 NOV 66	JRK
BK	*REVISED PER TDRR 31622*	15 NOV 66	JRK

REV														
SHEET														
REV STATUS OF SHEETS	REV	BK	BC	BH	BC	BF	BF	BF	BF	BJ	BJ	BK	BE	BE
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 13

MIL 1377A6 12-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BJ	SHEET 10 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BK	SHEET 11 OF 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

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GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2 ~~2~~ of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	C512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3 of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	C512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4 Of 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 5 OF 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 6 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 7 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 8 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BJ	SHEET 9 of 13

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N.	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BJ	SHEET 10 OF 13	

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BK	SHEET 11 OF 13	

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BE	SHEET 12 OF 13	

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BE	SHEET 13 OF 13	

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BJ	SHEET 10 OF 13

FORM 2054 9-65

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900798-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BK	SHEET 11 OF 13

MIL 2084 9-65

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

MIL 2084 9-65

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE.LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH.TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE.AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE.AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE.AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

MIL 2084 9-65

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK

(14)

REV STATUS OF SHEETS														
REV	BM	BC	BL	BL	BF	BF	BF	BF	BJ	BM	BM	BE	BE
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER H. Brinkman 1 FEB 65
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 13

MIL 1377A6 12-65

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	9 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK

REV STATUS OF SHEETS														
REV		BM	BC	BL	BL	BF	BF	BF	BF	BJ	BM	BM	BE	BE
SHEET		1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER H. Fimbone
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 13

ML 1377A6 12-65

GLOSSARY

ITEM NO. CAPA-BILITY 0512LR PART NUMBER TITLE MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BC | SHEET 2Z of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	C512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	NOT END ITEM
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	AGED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BL | SHEET 3 of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.RELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BL | SHEET 4 Of 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BF | SHEET 5 OF 13

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 6 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 7 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 8 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BJ	SHEET 9 OF 13

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 6 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 7 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 8 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BJ	SHEET 9 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900063-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BM	SHEET 10 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET,LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BM	SHEET 11 OF 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
	APPENDIX			
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,COU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM COU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BM	SHEET 10 OF 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET,LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BM	SHEET 11 OF 13

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	COU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329.	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK

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REV														
SHEET														
REV STATUS OF SHEETS	REV	BN	BC	BL	BL	BF	BF	BF	BF	BJ	BM	BN	BE	BE
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
Cambridge Mass.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAFTSMAN: R JONES 22 JAN 65 (DAY MO YR)
CHECKER: G PUKK 2 FEB 65
ENGINEER:
APPROVAL: C. SPERLING
CONTR NO.:
NASA APPROVAL: A. METZGER 2 FEB 65
MIT APPROVAL: W. KUPFER 2 FEB 65

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE: A
CODE IDENT. NO: 80230
1900030
SCALE: NONE
SHEET 1 OF 13

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 22 of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	- 1900030
SCALE-NONE	REV LTR BL	SHEET 3 Of 13

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4 Of 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014961	COMPUTER SIMULATOR	
511	051	2	1014961-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014040-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 5 OF 13

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT..UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 6 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 7 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 8 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BJ	SHEET 9 OF 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1431	051	34	1902204-011	G&N MTG.FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900063-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BN	SHEET 10 OF 13

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BN	SHEET 11 OF 13

MIL 2084 9-65

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 12 OF 13

MIL 2084 9-65

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET.100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET.BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET.LEM	
47	1	1902545-011	ADAPTER CABLE SET.100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE.BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE.LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH.MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH.TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE.AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE.AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE.AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BE	SHEET 13 OF 13

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APPLICATION	
NEXT ASSY	USED ON
1000000	

Ⓝ

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK

REV															
SHEET															
REV STATUS OF SHEETS	REV	BN	BC	BL	BL	BF	BF	BP	BP	BP	BP	BP	BE	BP	BP
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 14

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

MIL 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

FORM 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY, S.R ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

FORM 2084 9-65

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 5

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT.NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT.MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BF	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BP	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BP	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BP	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 12

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTFRCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31060		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BP	SHEET 14

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GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

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KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	--
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

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KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY, S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

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RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BF	SHEET 5

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900C67-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	290C998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	290C999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	12	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BR	SHEET 12

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899030	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BP	SHEET 14

MIL 2084 9-65

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
Ⓜ BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
Ⓜ BP	REVISED PER TDRR 32153	22 DEC 66	JRK
Ⓜ BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.

REV															
SHEET															
REV STATUS OF SHEETS	REV	BS	BC	BL	BL	BF	BF	BP	BP	BP	BP	BS	BS	BP	BP
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G.PUKK 2FEB65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2FEB65
NASA APPROVAL
W. KUPFER 2 FEB65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-66

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BC		SHEET 2

MIL 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BL		SHEET 3

FORM 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.R. ELECTRICAL, W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BL		SHEET 4

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BF		SHEET 5

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT..UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BF	SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 7

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 8

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BP	SHEET 9

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900C67-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATICN CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	290C998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E 1900030	
SCALE-NONE	REV LTR	BP	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	C512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	190C797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SFT LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E 1900030	
SCALE-NONE	REV LTR	BS	SHEET 11

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	12	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E 1900030	
SCALE-NONE	REV LTR	BS	SHEET 12

FORM 2084 9-65

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTFM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE A	CODE IDENT NO. 80230	A P O L L O G & N G S E 1900030	
SCALE-NONE	REV LTR	BP	SHEET 13

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BP	SHEET 14

MIL 2084 9-65

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	9 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK
BR	REVISED PER TDRR 32806	31 JAN 67	JRK / JAC
BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
BT	REVISED PER TDRR 33476	21 APR 67	JRK

REV															
SHEET															
REV STATUS OF SHEETS	REV	BT	BC	BL	BL	BT	BT	BT	BT	BT	BT	BT	BT	BT	BT
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 4 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A | CODE IDENT. NO 80230 | 1900030

SCALE NONE | SHEET 1 OF 14

ML 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSULETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	C512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	C512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-021	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014034-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR RT	SHEET 5

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020337	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016319-011	AGC CONN.COVER GROUP	
710	2L	7	2014299	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR FT	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR PT	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 103	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-108	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY.
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900603-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900604-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	12	234	2901074-011	ADAPTER SET BLK II/100	
1673	L	234	6900077-011	ADAPTER SET LEM	
1674	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	12	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 12

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017363-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
C7	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-165
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900809-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	SPAR OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR ET	SHEET 14

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK
BR	REVISED PER TDRR 32806	31 JAN 67	JRK JAC
BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
BT	REVISED PER TDRR 33476	21 APR 67	JRK
BU	REVISED PER TDRR 33560	24 APR 67	JRK WD.

REV															
SHEET															
REV STATUS OF SHEETS	REV	BU	BC	BL	BL	BT	BT	BT	BT	BU	BU	BU	BU	BT	BT
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER GPU K 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 14

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = RGI (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	C512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.RELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 6

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 7

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 8

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BU	SHEET 9

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900598-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900598-021	HANDLING FIXTURE PSA	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BU	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1500	2L	1 5	2900599-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900599-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900077-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-0734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BU	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	12	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BU	SHEET 12

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900893	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900068-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31060		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR 6T	SHEET 14

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	
BD	REVISED PER TDRR 30085	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
ⓜ BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
ⓜ BP	REVISED PER TDRR 32153	22 DEC 66	JRK
ⓜ BR	REVISED PER TDRR 32806	31 JAN 67	JRK JRC
ⓜ BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
BT	REVISED PER TDRR 33476	21 APR 67	JRK
BU	REVISED PER TDRR 33560	24 APR 67	JRK WD.

REV STATUS OF SHEETS	REV	BV	BV	BC	BL	BL	BT	BT	BT	BT	BU	BU	BU	BU	BV	BT
	SHEET	1	1A	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A | CODE IDENT. NO 80230 | 1900030
SCALE NONE | SHEET 1 OF 14

MIL 1377A6 12-60

REVISIONS

CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK WD.

SIZE A | CODE IDENT NO. 80230 | 1900030
SCALE NONE | REV LTR BV | SHEET 1A

MIL 1377A8 6-60

GLOSSARY

ITEM NO. | CAPABILITY 0512LR | PART NUMBER | TITLE | MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BC | SHEET 2 ~~[illegible]~~

MIL 2064 9-65

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	NOT END ITEM
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	- 7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	--
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BL | SHEET 3

FORM 2064 9-65

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY,S/S ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BL | SHEET 4

FORM 2064 9-65

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR RT | SHEET 5

FORM 2064 9-65

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0730
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BU	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1370	C51	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	C512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	290CC70-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	290C066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	19C0014-011	G&N MTG,FIXTURE	
1431	C51	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	
1436	2	34	2900067-011	G&N MTG, FIXTURE	QUAL TEST CHANGE (ECP-270)
1437	12	34	2900C67-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	
1439	12	34	2900067-041	G&N MTG FIXTURE	QUAL TEST CHANGE (ECP-270)
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	C51	2 4	19006C6-021	PSA MOUNTING FIXTURE	
1450	C51	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	C5	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	C51	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	C51	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	C512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	C51	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	C512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	C512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	290C998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BU	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2500999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	29C0677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900C07-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	C512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	19C0804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	29C1143-011	PSA ADAPTER MODULE (BLK II)	
1610	C5	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	C51	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BU	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	65C0G01-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901C76-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901C74-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	12	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BU	SHEET 12

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6C14056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1CC1844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	29C0063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	19C0805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1C19840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	19C1520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	19C2602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BV	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 14

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

	LTR	DESCRIPTION	DATE	APPROVED
	BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
	BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	Jal
	BD	REVISED PER TDRR 30085	10 OCT 66	JJJ
	BE	REVISED PER TDRR 30806	7 NOV 66	JRK
	BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
	BG	REVISED PER TDRR 31329	9 NOV 66	JRK
	BH	REVISED PER TDRR 31482	11 NOV 66	JRK
	BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
(M)	BK	REVISED PER TDRR 31622	15 NOV 66	JRK
	BL	REVISED PER TDRR 31983	2 DEC 66	JRK
	BM	REVISED PER TDRR 32115	5 DEC 66	JRK
	BN	REVISED PER TDRR 32122	18 DEC 66	JRK
(M)	BP	REVISED PER TDRR 32153	22 DEC 66	JRK
(M)	BR	REVISED PER TDRR 32806	31 JAN 67	JRK JAC
(M)	BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
	BT	REVISED PER TDRR 33476	21 APR 67	JRK
	BU	REVISED PER TDRR 33560	24 APR 67	JRK WD.

REV																
SHEET																
REV STATUS OF SHEETS — REV	BW	BW	BC	BL	BL	BT	BT	BT	BW	[illegible]	BW	[illegible]	[illegible]	BV	BT
REV STATUS OF SHEETS — SHEET	1	1A	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 14

MIL 1377A6 12-66

REVISIONS

	CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
(M)	TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK JS.
	[illegible]		BW	REVISED PER TDRR 33694	16 MAY 67	JRK EF

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE NONE	REV LTR BW	SHEET 1A

MIL 1377A6 8-66

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BC		SHEET 2

MIL 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	--
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SER NO 5-9

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BL		SHEET 3

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MUV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BL		SHEET 4

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR RT		SHEET 5

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RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 0730
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 0720
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BW	SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BW	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	

SIZE A	CODE IDENT NO. 80230	A P O L L O G&N G S E 1900030	
SCALE-NONE	REV LTR	BW	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1610	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	

SIZE A	CODE IDENT NO. 80230	A P O L L O G&N G S E 1900030	
SCALE-NONE	REV LTR	BW	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	12	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	A P O L L O G&N G S E 1900030	
SCALE-NONE	REV LTR	BW	SHEET 12

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1C01844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	29C0063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	19C0805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	19C1520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	19C2602	CABLE SPECIAL W-111	A-23-269

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SCALE-NONE	REV LTR	BV	SHEET 13

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BT	SHEET 14

FORM 2034 9-65

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

	LTR	DESCRIPTION	DATE	APPROVED
	BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
	BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
	BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
	BE	REVISED PER TDRR 30806	7 NOV 66	JRK
	BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
	BG	REVISED PER TDRR 31329	9 NOV 66	JRK
	BH	REVISED PER TDRR 31482	11 NOV 66	JRK
	BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
Ⓜ	BK	REVISED PER TDRR 31622	15 NOV 66	JRK
	BL	REVISED PER TDRR 31983	2 DEC 66	JRK
	BM	REVISED PER TDRR 32115	5 DEC 66	JRK
	BN	REVISED PER TDRR 32122	12 DEC 66	JRK
Ⓜ	BP	REVISED PER TDRR 32153	22 DEC 66	JRK
Ⓜ	BR	REVISED PER TDRR 32806	31 JAN 67	JRK / JAC
Ⓜ	BS	REVISED PER TDRR 33240	22 MAR 67	RWT / WD.
	BT	REVISED PER TDRR 33476	21 APR 67	JRK
	BU	REVISED PER TDRR 33560	24 APR 67	JRK / WD.

REV																
SHEET																
REV STATUS OF SHEETS	REV	BY	BY	BC	BL	BL	BT	BT	BT	BW	BW	BW	BY	BY	BY	BT
	SHEET	1	1A	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A | CODE IDENT. NO 80230 | 1900030
SCALE NONE | SHEET 1 OF 14

MIL 1377A6 12-65

REVISIONS

	CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
Ⓜ	TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK / WD.
Ⓜ			BW	REVISED PER TDRR 33694	16 MAY 67	JRK / EF
			BY	REVISED PER TDRR 34011	2 AUG 67	JRK

SIZE A | CODE IDENT NO. 80230 | 1900030
SCALE NONE | REV LTR BY | SHEET 1A

MIL 1377A5 8-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

MIL 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

FORM 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.R ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

FORM 2084 9-65

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR RT	SHEET 5

FORM 2084 9-65

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 6

FORM 2064 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 7

FORM 2064 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BW	SHEET 8

FORM 2064 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BW	SHEET 9

FORM 2064 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BW	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDJ	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BY	SHEET 11

FORM 2084 9-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	12	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BY	SHEET 12

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BV	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILTTY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BT	SHEET 14

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
		BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
1000000		BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
		BE	REVISED PER TDRR 30806	7 NOV 66	JRK
		BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
		BG	REVISED PER TDRR 31329	9 NOV 66	JRK
		BH	REVISED PER TDRR 31482	11 NOV 66	JRK
		BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
	(14)	BK	REVISED PER TDRR 31622	15 NOV 66	JRK
		BL	REVISED PER TDRR 31983	2 DEC 66	JRK
		BM	REVISED PER TDRR 32115	5 DEC 66	JRK
		BN	REVISED PER TDRR 32122	18 DEC 66	JRK
		BP	REVISED PER TDRR 32153	22 DEC 66	JRK
		BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
		BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
		BT	REVISED PER TDRR 33476	21 APR 67	JRK
		BU	REVISED PER TDRR 33560	24 APR 67	JRK WD

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	BZ	BZ		BC	EL	BL	BT	BT	BT	BW	BW	BW	BY	BZ	BY	BT
	SHEET	1	1A		2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS.

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER H. [illegible]
APPROVAL C. SPERLING
CONTR NO.
A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A | CODE IDENT. NO 80230 | 1900030
SCALE NONE | SHEET 1 OF 14

MIL 1377A6 12-65

CHANGE NUMBER	REVISIONS				
	ZONE	LTR	DESCRIPTION	DATE	APPROVED
(M) TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK JS
(M)		BW	REVISED PER TDRR 33694	16 MAY 67	JRK EF
(M)		BY	REVISED PER TDRR 34011	2 AUG 67	JRK
		BZ	REVISED PER TDRR 34297	26 SEP 67	JRK

SIZE A | CODE IDENT NO. 80230 | 1900030
SCALE NONE | REV LTR BZ | SHEET 1A

MIL 1377A5 8-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL·NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	UPDATED TO ITEM 0670,PT OF 073
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	UPDATED TO ITEM 0670,PT OF 072
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	PART OF ITEM 0690
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
690	2L	5	2016316-011	SHIPPING KIT UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
720	051	5	2016312-011	SHIPPING KIT,NAV. DSKY	PART OF ITEM 0700
730	051	5	2016313-011	SHIPPING KIT,MAIN DSKY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BT	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BT	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BW	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL -	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMJ
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMJ
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BW	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PFA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PFA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BW	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1491	2	1 5	2900998-021	HANDLING FIXTURE,PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BY	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BZ	SHEET 12

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-126(GAEC LSC 420-11675)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BV	SHEET 13

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	BT	SHEET 14

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	GEN MTG,FIXTURE	
1431	051	34	1902204-011	GEN MTG,FIXTURE	
1433	1	34	1902204-021	GEN MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	GEN MTG, FIXTURE	
1437	12	34	2900067-021	GEN MTG. FIXTURE	
1438	12	34	2900067-031	GEN MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	GEN MTG FIXTURE	
1440	12	34	2900067-051	GEN MTG FIXTURE	
1441	12	34	2900067-061	GEN MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	GEN HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	GEN HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	GEN HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CJ	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CJ	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	±X	1 5	6900001-011	CONN. COVER SET LEM	
1651	±X	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1652	L	1	6900001-031	CONN. COVER SET LEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CL	SHEET 12

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	GEN INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CJ	SHEET 13

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GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = REI (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	*SER NO 5-9*
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM ACT SHIPPING CONT.	
291	L	5	6014000-011	LEM ACT SHIPPING CONT.	
300	L	5	6014056-011	ACT COVERS	
310	0512	5	1022980-011	CUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS ACT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 4

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	1XX	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CN	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	*PART OF 1901930*
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CJ	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	~~L~~ X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	~~L~~ X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	~~L~~ X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1304	L	234	6900043-051	CABLE SET, INTERCONN LEM	
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CK	SHEET 9

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ACAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITFM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902596-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	CJ	SHEET 14

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GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE NONE
REV LTR CH
SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	601400З-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE NONE
REV LTR CH
SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019640-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014060-000	LEM AOT SHIPPING CONT.	
291	L	5	6014060-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE NONE
REV LTR CP
SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE NONE
REV LTR CP
SHEET 5

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016316-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CP		SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CP		SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900149-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CP		SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CP		SHEET 9

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31492	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK
BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
BT	REVISED PER TDRR 33476	21 APR 67	JRK
BU	REVISED PER TDRR 33560	24 APR 67	JRK WD.

REV STATUS OF SHEETS															
REV	CA	CA	BC	BL	BL	BT	CA	BT	BW	BW	BW	BY	BZ	BY	BT
SHEET	1	1A	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUK K 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A | CODE IDENT. NO 80230 | 1900030

SCALE NONE | SHEET 1 OF 14

MIL 1377A6 12-65

REVISIONS

CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK
		BW	REVISED PER TDRR 33694	15 MAY 67	JRK EF
		BY	REVISED PER TDRR 34011	2 AUG 67	JRK
		BZ	REVISED PER TDRR 34297	26 SEP 67	JRK
		CA	REVISED PER TDRR 34348	28 SEP 67	JRK

SIZE A | CODE IDENT NO. 80230 | 1900030

SCALE NONE | REV LTR CA | SHEET 1A

MIL 1377A5 8-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2 ~~3~~

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NOT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
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SCALE-NONE	REV LTR BL	SHEET 3

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.RELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

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SCALE-NONE	REV LTR CA		SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BT		SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	

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SCALE-NONE	REV LTR BW		SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	

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SCALE-NONE	REV LTR BW		SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1362	-2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BY		SHEET 11

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	-1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BZ		SHEET 12

FORM 2084 REV 367

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-126(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BV		SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900609-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9		MODEL NO. GAEC LSC 410-31080	
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 14

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
		BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
1000000		BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
		BE	REVISED PER TDRR 30806	7 NOV 66	JRK
		BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
		BG	REVISED PER TDRR 31329	9 NOV 66	JRK
		BH	REVISED PER TDRR 31482	11 NOV 66	JRK
		BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
		BK	REVISED PER TDRR 31622	15 NOV 66	JRK
		BL	REVISED PER TDRR 31983	2 DEC 66	JRK
		BM	REVISED PER TDRR 32115	5 DEC 66	JRK
		BN	REVISED PER TDRR 32122	12 DEC 66	JRK
		BP	REVISED PER TDRR 32153	22 DEC 66	JRK
		BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
		BS	REVISED PER TDRR 33240	22 MAR 67	RWT / WD.
		BT	REVISED PER TDRR 33476	21 APR 67	JRK
		BU	REVISED PER TDRR 33560	24 APR 67	JRK WD

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	CB	CB		BC	BL	BL	BT	CA	BT	CB	CB	CB	CB	CB	BV	BT
	SHEET	1	1A		2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER H. [illegible]
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A | CODE IDENT. NO 80230 | 1900030
SCALE NONE | SHEET 1 OF 14

ML 1377A6 12-65

CHANGE NUMBER	REVISIONS				
	ZONE	LTR	DESCRIPTION	DATE	APPROVED
TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK WD
		BW	REVISED PER TDRR 33694	15 MAY 67	JRK EF
		BY	REVISED PER TDRR 34011	2 AUG 67	JRK
		BZ	REVISED PER TDRR 34297	26 SEP 67	JRK
		CA	REVISED PER TDRR 34348	28 SEP 67	JRK
		CB	REVISED PER TDRR 34397	3 OCT 67	JRK

SIZE A | CODE IDENT NO. 80230 | 1900030
SCALE NONE | REV LTR CB | SHEET 1A

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET ~~2~~ 2

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	C512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NOT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	C512	5	1019837-021	PORTABLE LIGHT.ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	C512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 5

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1022439	MOUNTING KIT AGC (BLK I)	
661	51	5	1022338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2014318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CA	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902155-011	GSE PSA J-BOX	
1077	1	2 4	1902155-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901961-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CB	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901309-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CB	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1902606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1902606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CB	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP,BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902271-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	

SIZE A	CODE IDENT NO 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CB	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900855-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CB	SHEET 12

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-126(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	BV	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902566-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9		MODEL NO. GAEC LSC 410-31080	
51	1	1699050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1699051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR ET	SHEET 14

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	15 SEP 66	[illegible]
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
[illegible]	[illegible]	[illegible]	[illegible]
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK
BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD
BT	[illegible]	[illegible] APR 67	JRK
BU	REVISED PER TDRR 33560	24 APR 67	JRK

REV STATUS OF SHEETS	REV	CC	CC		BC	EL	EL	BT	CA	BT	CB	CB	CB	CC	CC	BV	BT
	SHEET	1	1A		2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R. JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G.P.J.K. 2 FEB 65
ENGINEER
APPROVAL
CONTR NO.
A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 14

MIL 1377A6 12-65

CHANGE NUMBER	ZONE.	LTR	DESCRIPTION	DATE	APPROVED
TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK
		BW	REVISED PER TDRR 33694	15 MAY 67	JRK EF
		BY	REVISED PER TDRR 34011	2 AUG 67	JRK
		BZ	REVISED PER TDRR 34297	26 SEP 67	JRK
		CA	REVISED PER TDRR 34348	28 SEP 67	JRK
		CB	REVISED PER TDRR 34397	3 OCT 67	JRK
		CC	REVISED PER TDRR 34411	3 OCT 67	JRK

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE NONE	REV LTR CC	SHEET 1A

MIL 1377A5 8-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LCRS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = REI (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BC	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 6	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NOT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BL	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	X	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001944-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001944-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.B.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BL	SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE NONE	REV LTR BT	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CA		SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BT		SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CB		SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CB		SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	FTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	FTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015452	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902201-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CB
SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900077-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900067-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900067-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900085-011	IMU PLATE ASSY IMU/FTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	

~~MIT BUILT~~

SIZE A
CODE IDENT NO 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CC
SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901360-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A
CODE IDENT NO 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CC
SHEET 12

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL.' FIXTURE	A-23-097
02	0512	1021643	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019857-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019964-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-126(GAEC LSC 420-11675)		
08	L	6014038-011	AOT LENS COVERS	A-23-112
09	0512	1022983	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016313-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1015640	RETRO-REFLECTING PRISM	A-23-200
23	2	2901360-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

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CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BV
SHEET 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-021	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-0734132	BREAKOUT BOX PSAAM BLK I	A-23-203
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	SPART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901144-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31050		
51	1	1595050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	ET	SHEET 14

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
Ⓜ BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
Ⓜ BP	REVISED PER TDRR 32153	22 DEC 66	JRK
Ⓜ BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
Ⓜ BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
BT	REVISED PER TDRR 33476	21 APR 67	JRK
BU	REVISED PER TDRR 33560	24 APR 67	JRK WD.

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	CD	CD		BC	BL	BL	BT	CA	BT	CB	CD	CD	CD	CD	BV	BT
	SHEET	1	1A		2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 14

MIL 1377A6 12-65

REVISIONS

CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
Ⓜ TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	29 APRIL 67	JFK WD
Ⓜ		BW	REVISED PER TDRR 33694	16 MAY 67	JRK EF
Ⓜ		BY	REVISED PER TDRR 34011	2 AUG 67	JRK
		BZ	REVISED PER TDRR 34297	26 SEP 67	JRK
		CA	REVISED PER TDRR 34348	28 SEP 67	JRK
		CB	REVISED PER TDRR 34397	3 OCT 67	JRK
		CC	REVISED PER TDRR 34411	3 OCT 67	JRK
		CD	REVISED PER TDRR 34660	4 OCT 67	JRK

SIZE	CODE IDENT NO.		
A	80230	1900030	
SCALE NONE	REV LTR	CD	SHEET 1A

MIL 1377A5 8-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

MIL 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

FORM 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.R ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 4

FORM 2084 9-65

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR RT	SHEET 5

FORM 2084 9-65

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CA	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CB	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CD	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900312-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CD	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY ,	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CD	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CD	SHEET 12

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BV	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 14

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	18 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK
BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
BT	REVISED PER TDRR 33476	21 APR 67	JRK
BU	REVISED PER TDRR 33560	24 APR 67	JRK

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	CE	CE		BC	EL	CE	BT	CA	BT	CB	CD	CD	CD	CD	BV	BT
	SHEET	1	1A		2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 14

MIL 1377A6 12-65

REVISIONS

CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893. ② ADDED SHT 1A	28 APRIL 67	JRK
		BW	REVISED PER TDRR 33694	15 MAY 67	JRK EF
		BY	REVISED PER TDRR 34011	2 AUG 67	JRK
		BZ	REVISED PER TDRR 34297	26 SEP 67	JRK
		CA	REVISED PER TDRR 34348	28 SEP 67	JRK
		CB	REVISED PER TDRR 34397	3 OCT 67	JRK
		CC	REVISED PER TDRR 34411	3 OCT 67	JRK
		CD	REVISED PER TDRR 34660	4 OCT 67	JRK
		CE	REVISED PER TDRR 35009	29 NOV 67	JRK

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE NONE	REV LTR CE	SHEET 1A

MIL 1377A5 8-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSULETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BC
SHEET 2

MIL 2084 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	C512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	NOT END ITEM
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	OBSOLETE
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	MIT BUILT
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	ACED ONLY
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BL
SHEET 3

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	C512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	C512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MCV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE.
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR ~~BE~~ CE
SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-021	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST.SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BT
SHEET 5

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CA
SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345679	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BT
SHEET 7

FORM 2084 9-66

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902155-011	GSE PSA J-BOX	
1077	1	2 4	1902155-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901961-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CB
SHEET 8

FORM 2084 REV 3-67

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CD
SHEET 9

FORM 2084 REV 3-67

AC-ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900312-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901346-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CD	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IPU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CD	SHEET 11

FORM 2084 REV 3-67

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CD	SHEET 12

FORM 2084 REV 3-67

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-126(GAEC LSC 420-11675)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BV	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	GEN HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO GEN GSE
A	60230	1900030
SCALE-NONE	REV LTR BT	SHEET 14

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
BE	REVISED PER TDRR 30806	7 NOV 66	JRK
BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
BG	REVISED PER TDRR 31329	9 NOV 66	JRK
BH	REVISED PER TDRR 31482	11 NOV 66	JRK
BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
BK	REVISED PER TDRR 31622	15 NOV 66	JRK
BL	REVISED PER TDRR 31983	2 DEC 66	JRK
BM	REVISED PER TDRR 32115	5 DEC 66	JRK
BN	REVISED PER TDRR 32122	12 DEC 66	JRK
BP	REVISED PER TDRR 32153	22 DEC 66	JRK
BR	REVISED PER TDRR 32806	3 JAN 67	JRK JAC
BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
BT	REVISED PER TDRR 33476	21 APR 67	JRK
BU	REVISED PER TDRR 33560	24 APR 67	JRK WD.

REV STATUS OF SHEETS																	
REV	CF	CF		BC	BL	CE	BT	CF	BT	CB	CD	CD	CD	CD	BV	BT
SHEET	1	1A		2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-65

REVISIONS

	CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
Ⓜ	TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK WD
Ⓜ			BW	REVISED PER TDRR 33694	16 MAY 67	JRK EF
Ⓜ			BY	REVISED PER TDRR 34011	2 AUG 67	JRK
			BZ	REVISED PER TDRR 34297	26 SEP 67	JRK
			CA	REVISED PER TDRR 34348	28 SEP 67	JRK
			CB	REVISED PER TDRR 34397	3 OCT 67	JRK
			CC	REVISED PER TDRR 34411	3 OCT 67	JRK
Ⓜ			CD	REVISED PER TDRR 34660	4 OCT 67	JRK
			CE	REVISED PER TDRR 35009	29 NOV 67	JRK
			CF	REVISED PER TDRR 35083	30 NOV 67	JRK

SIZE A
CODE IDENT NO. 80230
1900030
SCALE NONE
REV LTR CF
SHEET 1A

MIL 1377A5 8-65

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = CSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BC	SHEET 2

MIL 2084 9-65

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BL	SHEET 3

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KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY. S.RELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CE	SHEET 4

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RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 5

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RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1C20313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2C14255-C11	INTERCONN.SET SYSTEM	
582	12L	34 6	2C14255-C21	INTERCONN. SET SYSTEM	
583	12L	34 6	2C14255-C31	INTERCONN. SET SYSTEM	
590	0	1	1C20225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1C20001-001	HANDLING FIXTURE AGC	
601	0	5	1C20001-002	HANDLING FIXTURE AGC	
602	51	5	1C20001-003	HANDLING FIXTURE AGC	
603	51	5	1C20001-004	HANDLING FIXTURE AGC	
604	51	5	1C20001-005	HANDLING FIXTURE AGC	
607	2L	5	2C14282-011	HANDLING FIXTURE AGC	
608	2L	5	2C14282-021	HANDLING FIXTURE AGC	
610	051	5	1C14377	HANDLING FIXT.MAIN DSKY	
611	051	5	1C14377-C11	HANDLING FIXT.MAIN DSKY	
620	051	5	1C14334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1C14334-C11	HANDLING FIXT.NAV. DSKY	
630	051	5	1C06230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1C06421	SHIPPING CONTAINER AGC	
640	051	5	1C06229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1C06231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1C20339	MOUNTING KIT AGC (BLK I)	
661	51	5	1C20338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1C06422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2C14013-C11	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
710	2L	7	2C14399	CONNECTOR COVER KIT BLKII	
701	2L	5	2016318-021	AGC CONN. COVER GROUP	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CF	SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR BT	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902155-011	GSE PSA J-BOX	
1077	1	2 4	1902155-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	2L	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	2L	1	2900063-021	LIFTING TEMP. CONTROLLER	
1110	2L	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	2L	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CB	SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CD	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CD | SHEET 10
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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

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SCALE-NONE | REV LTR CD | SHEET 11
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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CD | SHEET 12
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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021540	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-011	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-011	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR BV | SHEET 13
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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR BT	SHEET 14

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

	LTR	DESCRIPTION	DATE	APPROVED
	BB	REPLACES REVISION BA WITH CHG. PER TDRR 29695	6 SEP 66	DKD
	BC	REPLACES REV BB WITH CHG PER TDRR 30072	13 SEP 66	JAL
	BD	REVISED PER TDRR 30095	10 OCT 66	JJJ
	BE	REVISED PER TDRR 30806	7 NOV 66	JRK
	BF	REVISED PER TDRR 30985	7 NOV 66	JRK.
	BG	REVISED PER TDRR 31329	9 NOV 66	JRK
	BH	REVISED PER TDRR 31482	11 NOV 66	JRK
	BJ	REVISED PER TDRR 31534	11 NOV 66	JRK
Ⓜ	BK	REVISED PER TDRR 31622	15 NOV 66	JRK
	BL	REVISED PER TDRR 31983	2 DEC 66	JRK
	BM	REVISED PER TDRR 32115	5 DEC 66	JRK
	BN	REVISED PER TDRR 32122	12 DEC 66	JRK
Ⓜ	BP	REVISED PER TDRR 32153	22 DEC 66	JRK
Ⓜ	BR	REVISED PER TDRR 32806	31 JAN 67	JRK JAC
Ⓜ	BS	REVISED PER TDRR 33240	22 MAR 67	RWT/ WD.
	BT	REVISED PER TDRR 33476	21 APR 67	JRK
	BU	REVISED PER TDRR 33560	24 APR 67	JRK WD.

REV																	
SHEET																	
REV STATUS OF SHEETS REV	C6	C6		C	BL	CE	BT	CF	BT	C6	C6	C6	C6	C6	C6	C6	C6
SHEET	1	1A		2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G PUKK 2 FEB 65
ENGINEER
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 15

MIL 1377A6 12-60

REVISIONS

	CHANGE NUMBER	ZONE	LTR	DESCRIPTION	DATE	APPROVED
Ⓜ	TDRR 33636		BV	① ITEM 26, SHT 13 WAS 2900893, ② ADDED SHT 1A	28 APRIL 67	JRK WD.
Ⓜ			BW	REVISED PER TDRR 33694	16 MAY 67	JRK EF
Ⓜ			BY	REVISED PER TDRR 34011	2 AUG 67	JRK
			BZ	REVISED PER TDRR 34297	26 SEP 67	JRK
			CA	REVISED PER TDRR 34348	28 SEP 67	JRK
			CB	REVISED PER TDRR 34397	3 OCT 67	JRK
			CC	REVISED PER TDRR 34411	3 OCT 67	JRK
Ⓜ			CD	REVISED PER TDRR 34660	4 OCT 67	JRK
			CE	REVISED PER TDRR 35009	29 NOV 67	JRK
Ⓜ			CF	REVISED PER TDRR 35083	30 NOV 67	JRK
			C6	REVISED PER TDRR 35344	28 DEC 67	RA.W.

SIZE A
CODE IDENT NO. 80230
1900030
SCALE NONE
REV LTR C6
SHEET 1A

MIL 1377A6 6-60

GLOSSARY

ITEM NO. | CAPA-BILITY 0512LR | PART NUMBER | TITLE | MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A
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APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BC
SHEET 2

MIL 2064 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR BL
SHEET 3

FORM 2064 9-65

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ~~ASSY~~ S.R.ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CE
SHEET 4

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR AT
SHEET 5

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RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1C20313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2C14255-C11	INTERCONN.SET SYSTEM	
582	12L	34 6	2C14255-C21	INTERCONN. SET SYSTEM	
583	12L	34 6	2C14255-C31	INTERCONN. SET SYSTEM	
590	0	1	1C20225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1C20001-001	HANDLING FIXTURE AGC	
601	0	5	1C20001-C02	HANDLING FIXTURE AGC	
602	51	5	1C20001-003	HANDLING FIXTURE AGC	
603	51	5	1C20001-004	HANDLING FIXTURE AGC	
604	51	5	1C20001-005	HANDLING FIXTURE AGC	
607	2L	5	2C14282-011	HANDLING FIXTURE AGC	
608	2L	5	2C14282-C21	HANDLING FIXTURE AGC	
610	051	5	1C14377	HANDLING FIXT.MAIN DSKY	
611	051	5	1C14377-C11	HANDLING FIXT.MAIN DSKY	
620	051	5	1C14334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1C14334-C11	HANDLING FIXT.NAV. DSKY	
630	051	5	1C06230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1C06421	SHIPPING CONTAINER AGC	
640	051	5	1C06229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	10C6231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1C20339	MOUNTING KIT AGC (BLK I)	
661	51	5	1C20338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1C06422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2C14013-C11	HANDLING FIXT..UNIVERSAL DSKY	
700	2L	5	2C16318-011	AGC CONN.COVER GROUP	
710	2L	7	2C14399	CONNECTOR COVER KIT BLKII	
701	*2L*	*5*	*2016318-021*	*AGC CONN. COVER GROUP*	

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SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CF	SHEET 6	

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345679	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

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SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR BT	SHEET 7	

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	

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SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CG	SHEET 8	

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
					~~[illegible]~~

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SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CG	SHEET 9	

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-27C)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-27C)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1441	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CG	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CG	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAP BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902549-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CG	SHEET 12

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CG	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND CLAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019584-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022580	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR C6	SHEET 14

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAP BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC	GAEC LSC 410-31090		
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	20[illegible]4013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR C6	SHEET 15

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ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	IOTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 8

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 9

FORM 2084 REV 367

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(KIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019584-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022960	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA F2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 14

FORM 2084 REV 367

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1895050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1895051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 15

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK

REV														
SHEET														
REV STATUS OF SHEETS	REV	CJ	CH	CH	CH	CH	CH	CH	CJ	CJ	CJ	CJ	CJ	CJ	CJ
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 14

MIL 1377A8 12-65

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE, ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZ IM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE, VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	*SER NO 5-9*
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS A/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS A/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS A/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM ACT SHIPPING CONT.	
291	L	5	6014000-011	LEM ACT SHIPPING CONT.	
300	L	5	6014056-011	ACT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS ACT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP, PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL, W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 4

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
579	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 6

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 7

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	*PART OF 1901930*
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 8

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	L	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	L	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	L	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 9

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	GEN MTG,FIXTURE	
1431	051	34	1902204-011	GEN MTG,FIXTURE	
1433	1	34	1902204-021	GEN MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	GEN MTG, FIXTURE	
1437	12	34	2900067-021	GEN MTG. FIXTURE	
1438	12	34	2900067-031	GEN MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	GEN MTG FIXTURE	
1440	12	34	2900067-051	GEN MTG FIXTURE	
1441	12	34	2900067-061	GEN MTG FIXTURE	
1442	0	2 4	1900636-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900636-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	GEN HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	GEN HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	GEN HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 11

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	L	1 5	6900001-011	CONN. COVER SET LEM	
1651	L	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	512L	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	512L	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	512L	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 12

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APPENDIX

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	GEN INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900063-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 13

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-204
40	L	6900031-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31083		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CJ	SHEET 14

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK
CK	REVISED PER TDRR 35637	5 MAR 68	

REV STATUS OF SHEETS	REV	CK			CH	CH	CH	CH	CH	CH	CJ	CK	CJ	CJ	CJ	CJ	CJ
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

NASA APPROVAL A.METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	*SER NO 5-9*
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS A/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS A/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS A/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014000-000	LEM ACT SHIPPING CONT.	
291	L	5	6014000-011	LEM ACT SHIPPING CONT.	
300	L	5	6014056-011	ACT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS ACT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 4

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1620341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCOMM.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCOMM.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCOMM.SET S/S	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 7

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	*PART OF 1901930*
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CJ	SHEET 8

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	±X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	±X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	±X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1304	L	234	6900043-051	CABLE SET, INTERCONN LEM	
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CK	SHEET 9

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902595-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9.	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 14

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ

REV															
SHEET															
REV STATUS OF SHEETS	REV	CL			CH	CH	CH	CH	CH	CH	CJ	CK	CJ	CJ	CL	CJ	CJ
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

NASA APPROVAL A.METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	*SER NO 5-9*
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS A/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS A/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS A/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM ACT SHIPPING CONT.	
291	L	5	6014000-011	LEM ACT SHIPPING CONT.	
300	L	5	6014056-011	ACT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS ACT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCOMM.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCOMM.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCOMM.SET S/S	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 6

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 7

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT..	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CJ	SHEET 8

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	*X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	*X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	*X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1304	L	234	6900043-051	CABLE SET, INTERCONN LEM	
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CK	SHEET 9

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9.	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CJ		SHEET 14

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	URK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	URK
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ

REV STATUS OF SHEETS	REV	CM			CH	CH	CH	CH	CH	CH	CJ	CK	CJ	CJ	CM	CJ	CJ
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
Cambridge, Mass

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL G.SPERLING
CONTR NO.

A.METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-63

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO GEN GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019[illegible]-000	SHAFT ACCURACY TESTER	
60	L	7	6014[illegible]3-011	ACT TESTER ASSY	
70	051	8	1016[illegible]1-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO GEN GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	*SER NO 5-9*
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014000-000	LEM ACT SHIPPING CONT.	
291	L	5	6014000-011	LEM ACT SHIPPING CONT.	
300	L	5	6014056-011	ACT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS ACT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)

SIZE	CODE IDENT NO.	APOLLO GEN GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 4

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	APOLLO GEN GSE
A	80230	1900030
SCALE NONE	REV LTR CH	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	6 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	2L	5	2014282-011	HANDLING FIXTURE AGC	
608	2L	5	2014282-021	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 6

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1075	5	2 4	1901933-031	GSE PSA J-BOX	*PART OF 1901930*
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	*X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	*X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	*X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC

SIZE A	CODE IDENT NO. 80230	APOLLO. G&N GSE 1900030
SCALE-NONE	REV LTR CK	SHEET 9

APPENUIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	GEN HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-193
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022978	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO.	GAEC LSC 410-31080	
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CJ	SHEET 14

FORM 2466 REV. 3/67

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
1000000		CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
		CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
		CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
		CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
		CN	REVISED PER TDRR 35707	11 MAR 68	JJJ

REV STATUS OF SHEETS	REV	CN			CH	CH	CH	CH	CN	CH	CJ	CK	CJ	CJ	CM	CJ	CJ
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

A.METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 14

MIL 1377A6 12-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 11

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	±X	1 5	6900001-011	CONN. COVER SET LEM	
1651	±X	1 5	6900001-021	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/P SAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/PSAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1683	512L	234	2900895-041	CALIBRATION & TEST ASSEMBLY SCM/PSAAM	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CM ~~CJ~~	SHEET 12

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W1C3)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CJ	SHEET 13

FORM 2084 REV 367

APPLICATION

NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV (CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK TAC
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	CP			CH	CH	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP
	SHEET	1			2	3	4	5	6	1	8	9	10	11	12	13	14	15

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 15

MIL 1377A6 12-66

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020061-001	HANDLING FIXTURE AGC	
601	0	5	1020061-002	HANDLING FIXTURE AGC	
602	51	5	1020061-003	HANDLING FIXTURE AGC	
603	51	5	1020061-004	HANDLING FIXTURE AGC	
604	51	5	1020061-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CP	SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900060-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900060-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901459-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CP	SHEET 7

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PLA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CP	SHEET 8

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II.	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT #103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CP	SHEET 9

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CP	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900958-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900958-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900959-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900959-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900067-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900067-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900068-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900068-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900068-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CP	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021618	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1670	12L	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902549-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CP	SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CP	SHEET 13

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-C11	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-C11	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-C11	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-C11	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-C11	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-C11	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-C11	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-C21	I.C.T.C.	S-23-100
18	051	1901492-C21	AUX.BATTERY PACK	S-23-101
19	2L	2900063-C31	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-C11	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901360-C11	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-C11	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CP	SHEET 14

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051.	1901426-C11	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-C31	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-C21	PSA ADAPTER MODULE	A-23-201
34	5	1902431-C31	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-C11	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-C11	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEP 9			
43	12	2901075-C11	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-C11	ADAPTER CABLE SET,LEM	
47	1	1902545-C11	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-C11	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-C11	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	,051	1014344-C11	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CP	SHEET 15

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GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = REI (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE, ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 4

FORM 2084 REV 3-67

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET.	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 5

FORM 2084 REV 3-67

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 10

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900958-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900958-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900959-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900959-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900067-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900067-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 11

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CR	SHEET 12

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CR	SHEET 13

FORM 2084 REV 367

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
	APPENDIX			
01	0512	1017383-C11	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-C11	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-C11	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-C11	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-C11	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-C11	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-C11	CONNECTOR COVER GROUP	H-23-208
15	2L	2014349	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	941			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-C21	I.C.T.C.	S-23-100
18	051	1901492-C21	AUX.BATTERY PACK	S-23-101
19	2L	2900063-C31	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-C11	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-C11	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CP		SHEET 14

FORM 2084 REV 367

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-C11	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-C31	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-C21	PSA ADAPTER MODULE	A-23-201
34	5	1902431-C31	PSA ADAPTER.MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF	ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM	PART OF ITEM 9		
43	12	2901075-C11	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-C11	ADAPTER CABLE SET,LEM	
47	1	1902545-C11	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-C11	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-C11	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-C11	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-C11	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-C11	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CP		SHEET 15

FORM 2084 REV 167

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV (CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	14 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK
CS	REVISED PER TDRR 36031	24 APR 68	JK

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	CS			CH	CH	CP	CS	CS	CP	CP	CP	CP	CP	CR	CR	CP	CP
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

NASA APPROVAL A.METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 15

MIL 1377A6 12-66

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NOT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	4014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 4

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CS	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	19026C2	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900C00-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1500800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1480	0	1 5	19000C9-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900958-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 14

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF	ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 15

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK
CS	REVISED PER TDRR 36031	24 APR 68	JK
CT	REVISED PER TDRR 36319	17 JUN 68	

REV																
SHEET																
REV STATUS OF SHEETS	REV	CT			CH	CH	CT	CS	CS	CP	CP	CP	CP	CR	CR	CR	CP	CP
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: AC8K ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

NASA APPROVAL A.METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 15

IHL 1277A6 12-65

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = REI (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030
SCALE-NONE | REV LTR CH | SHEET 2

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZ IM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030
SCALE-NONE | REV LTR CH | SHEET 3

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	~~60143[illegible]~~	CONNECTOR COVERS AOT	
330	XX	5	~~10277[illegible]~~	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	~~1001[illegible]-004~~	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	~~2001[illegible]005~~	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022936-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014522	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030
SCALE-NONE | REV LTR CT | SHEET 4

RAYTHEON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030
SCALE-NONE | REV LTR CS | SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CS	SHEET 6

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CR	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 8

FORM 2084 REV 3/67

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCO	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFAC	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFAC	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABL	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET.	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT #103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOO	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTU	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTU	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTU	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	SCALE-NONE	REV LTR CP	SHEET 10

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900958-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900958-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900959-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900959-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900067-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900067-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	SCALE-NONE	REV LTR CP	SHEET 11

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/P	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	SCALE-NONE	REV LTR CR	SHEET 12

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE. 1900030	SCALE-NONE	REV LTR CR	SHEET 13

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-C11	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-C11	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-C11	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-C11	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-C11	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-C11	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-C11	CONNECTOR COVER GROUP	H-23-208
15	2L	2014349	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-C21	I.C.T.C.	S-23-100
18	051	1901492-C21	AUX.BATTERY PACK	S-23-101
19	2L	2900063-C31	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-208
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 14

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-C11	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-C11	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC GAEC LSC 410-31090		
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-C11	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-C11	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900066-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CP	SHEET 15

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK
CS	REVISED PER TDRR 36081	24 APR 68	JK
CT	REVISED PER TDRR 36319	17 JUN 68	JAC
CU	REVISED PER TDRR 36323	21 JUN 68	JAC
CV	REVISED PER TDRR 36420	3 JULY 68	JK JAC

Ⓜ

REV STATUS OF SHEETS																		
REV	CV			CH	CH	CT	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV
SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: AC3K ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

A.METZGER 2 FEB 65
NASA APPROVAL

W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

IL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 2

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE, ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	NOT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
300	L	5	6014056-011	AOT COVERS	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CT	SHEET 4

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 5

FORM 2084 REV 367

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 6

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902199-011	GSE PSA J-BOX	
1077	1	2 4	1902199-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900220	PIC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	GEN MTG FIXTURE	
1440	12	34	2900067-051	GEN MTG FIXTURE	
1441	12	34	2900067-061	GEN MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 14

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	ADT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	ADT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	ADT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 15

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900086-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 16

FORM 2004 REV 367

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
		CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
1000000		CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
		CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
		CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
		CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
		CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
		CR	REVISED PER TDRR 35973	17 APR 68	JK
		CS	REVISED PER TDRR 36081	24 APR 68	JK
		CT	REVISED PER TDRR 36319	17 JUN 68	JAC
	Ⓜ	CU	REVISED PER TDRR 36323	21 JUN 68	JAC
		CV	REVISED PER TDRR 36420	3 JULY 68	JK JAC
		CW	REVISED PER TDRR 36424	5 JULY 68	JK JAC

REV STATUS OF SHEETS																		
REV	CW			CH	CH	CW	CW	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV
SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 6

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	05	1	1901492-011	AUX BATTERY PACK	
1091	0512	1	1901492-021	AUX BATTERY PACK	
1092	0512	1	1901492-031	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET.GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 10

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 11

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 12

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 13

FORM 2084 REV 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 14

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 15

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 16

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35639	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK
CS	REVISED PER TDRR 36031	24 APR 68	JK
CT	REVISED PER TDRR 36319	17 JUN 68	JAC
CU	REVISED PER TDRR 36323	21 JUN 68	JAC
CV	REVISED PER TDRR 36420	3 JULY 68	JK JAC
CW	REVISED PER TDRR 36424	5 JULY 68	JK JAC
CY	REVISED PER TDRR 36745	4 SEPT 68	JK JAC

Ⓜ

REV STATUS OF SHEETS																	
REV	CY			CH	CH	CW	CW	CV	CV	CV	CY	CY	CY	CY	CY	CV	CV	CV
SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

NASA APPROVAL A.METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO GEN
GROUND SUPPORT EQUIPMENT

SIZE	CODE IDENT. NO	
A	80230	1900030
SCALE NONE		SHEET 1 OF 16

IHL 1277A0 12-60

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CV	SHEET	6

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CV	SHEET	7

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	12L	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	12LR	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	12LR	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	12LR	234	2900022-041	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	12L	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	12LR	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	12LR	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	12LR	234	2900023-041	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CV	SHEET	8

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	0512	1	1901492-041	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900272	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.			
A	80230	APOLLO G&N GSE 1900030		
SCALE-NONE	REV LTR	CY	SHEET	9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CY | SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1350	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CY | SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CY | SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CY | SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	29C1628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	29C1629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 14

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 15

FORM 2604 REV 167

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 16

FORM 2604 REV 167

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK
CS	REVISED PER TDRR 36031	24 APR 68	JK
CT	REVISED PER TDRR 36319	17 JUN 68	JAC
CU	REVISED PER TDRR 36323	21 JUN 68	JAC
CV	REVISED PER TDRR 36420	3 JULY 68	JK JAC
CW	REVISED PER TDRR 36424	5 JULY 68	JK JAC
CY	REVISED PER TDRR 36745	4 SEPT 68	JK JAC
CZ	REVISED PER TDRR 36753	9 SEPT 68	ML JAC

Ⓜ

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	CZ			CH	CH	CW	CW	CV	CV	CZ	CZ	CZ	CZ	CZ	CZ	CZ	CV	CV
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

A.METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO GEN
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

IML 1377A6 12-65

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE DUA ENVIRONMENTAL	
1735		34	2901677	CABLE ASSEMBLY,SPECIAL PURPOSE W 183	
1736		34	2901678	CABLE ASSEMBLY,SPECIAL PURPOSE W 184	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DK	SHEET 14

FORM 2084 REV. 367

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31056)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 15

FORM 2084 REV. 367

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR ~~DV~~ DC	SHEET 16

FORM 2084 REV. 367

DELCO ELECTRON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1174	12LR	234	1902134-041	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1181	0512LR	234 8	2900405-021	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	XXX	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	XXXX	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	X	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	X	234	2900713-011	CABLE SET 100 SERIES	
1281	X	234	2900713-021	CABLE SET 100 SERIES	
1282	X	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	X	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	X	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	X	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	X	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	X	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	X	234	2900712-061	CABLE SET SPECIAL BLK II	

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ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	X	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	XXX	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	XX	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462-011	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	X	34	2900067-011	G&N MTG, FIXTURE	
1437	XX	34	2900067-021	G&N MTG. FIXTURE	

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ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1438	XX	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	XX	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	XX	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	XXX	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	XXXXX	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	X	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	XX	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	XXXXXX	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	

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ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	X X	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	X	1	1902431-011	PSA ADAPTER MODULE	
1601	X	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	X	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	X	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	X	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	X	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	X	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1612	2	1	2901143-031	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	XX	1	1021616	JUMPER BY PASS (BLK II)	
1622	2L	1	1021616-011	JUMPER BY PASS (BLK II)	
1630	X	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	X	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	X	234	2901076-011	ADAPTER SET BLK II	

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN. KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN. SET SUB-SYSTEM	

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
572	12L	4 6	2014268-021	INTERCONN. SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN. KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN. SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014015-011	HANDLING FIXT. UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

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ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1008	12LR	234	2900022-061	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	XX	234	2900024-011	GROUND DISTRIB BOX	
1061	XXX	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	X	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	

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ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1073	X	2 4	1901933-011	GSE PSA J-BOX	
1074	X	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	X	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	XXX	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	XXX	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	XXXXX	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	XXX	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	XX	234	2900037-011	PSA TEST POINT ADAPTER	
1143	XXX	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	

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A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	DN	SHEET 9

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1174	12LR	234	1902134-041	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1181	0512LR	234 8	2900405-021	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	XXX	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	XXXX	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	X	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	X	234	2900713-011	CABLE SET 100 SERIES	
1281	X	234	2900713-021	CABLE SET 100 SERIES	
1282	X	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	X	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	X	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	X	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	X	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	X	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	X	234	2900712-061	CABLE SET SPECIAL BLK II	

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ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	X	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	XXX	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	XX	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462-011	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	X	34	2900067-011	G&N MTG. FIXTURE	
1437	XX	34	2900067-021	G&N MTG. FIXTURE	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030

SCALE NONE | REV LTR | DN | SHEET 11

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1438	XX	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	XX	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	XX	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	XXX	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	XXXXX	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	X	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	XX	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900093-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	XXXXXX	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030

SCALE NONE | REV LTR | DN | SHEET 12

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	X X	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	X	1	1902431-011	PSA ADAPTER MODULE	
1601	X	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	X	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	X	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	X	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	X	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1608	L	1	6900088-041	PSA ADAPTER MODULE(LEM)	
1610	X	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	X	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1612	2	1	2901143-031	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	XX	1	1021616	JUMPER BY PASS (BLK II)	
1622	2L	1	1021616-011	JUMPER BY PASS (BLK II)	
1630	X	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	X	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030

SCALE NONE | REV LTR | DP | SHEET 13

DELCO ELECTRON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1671	X	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 6	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 6	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE OUA ENVIRONMENTAL	
1735		34	2901677	CABLE ASSEMBLY,SPECIAL PURPOSE W 183	

SIZE	CODE IDENT NO	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DP	SHEET 14

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DELCO ELECTRON

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1736		34	2901678	CABLE ASSEMBLY,SPECIAL PURPOSE W 184	
1737	2	1	2901693-011	FIXTURE ASSEMBLY, I M U JUMPER BY-PASS	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DP	SHEET 15

FORM 2084 REV 367

APPENDIX

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM.	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DP	SHEET 16

APPENDIX

ITEM NO.	CAPABILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DP	SHEET 17

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
DG	REVISED PER TDRR 37504	15 APR 69	JJJ
DH	REVISED PER TDRR 37549	2 MAY 69	JJJ
DJ	REVISED PER TDRR 37818	23 SEP 69	
DK	REVISED PER TDRR 37842	8 OCT 69	PHG RWH
DL	REVISED PER TDRR 38163	17 JUN 70	M.G. CP
DM	*REVISED PER TDRR 38185*	7-JUL -70	B. CP
DN	REVISED PER TDRR 38214	10 SEP 70	
DP	REVISED PER TDRR 38285	25 NOV 70	DKD CP
DR	REVISED PER TDRR 38288	2 DEC 70	CP

REV																		
SHEET																		
REV STATUS OF SHEETS	REV	DR	CH	DR	DK	DK	DK	DK	DN	DN	DN	DN	DN	DP	DR	DR	DP	DP
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 17

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CH | SHEET 2

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1019962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASSY	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019766-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIMU	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
181	0512	8	1017376-011	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR DP | SHEET 3

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV.	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING PING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR DK | SHEET 4

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	
410	L	5	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY STORAGE	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR DK | SHEET 5

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV (CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK
CS	REVISED PER TDRR 36031	24 APR 68	JK
CT	REVISED PER TDRR 36319	17 JUN 68	JAC
Ⓜ CU	REVISED PER TDRR 36323	21 JUN 68	JAC
CV	REVISED PER TDRR 36420	3 JULY 68	JK JAC
CW	REVISED PER TDRR 36424	5 JULY 68	JK JAC
CY	REVISED PER TDRR 36745	4 SEPT 68	JK JAC
CZ	REVISED PER TDRR 36753	9 SEPT 68	ML JAC
DA	REVISED PER TDRR 36755	19 SEPT 68	SW JAC

REV																		
SHEET																		
REV STATUS OF SHEETS	REV	DA			CH	CH	CW	CW	CV	CV	CZ	CZ	CZ	CZ	CZ	CZ	DA	CV	CV
	SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

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INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R JONES 22 JAN 65 (DAY MO YR)
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

A.METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(QUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	QUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (QUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

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A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 6

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

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A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CZ	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	0512	1	1901492-041	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER.	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	2L		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CZ	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CZ	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	

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SCALE-NONE	REV LTR	CZ	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900063-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900068-011	PSA ADAPTER MODULE(LEM)	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CZ	SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900068-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901340-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CZ	SHEET 13

APPLICATION	
NEXT ASSY	USED ON
	Ⓜ
1000000	

REVISIONS

	LTR	DESCRIPTION	DATE	APPROVED
	CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
	CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
	CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
	CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
	CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
Ⓜ	CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
	CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
	CR	REVISED PER TDRR 35973	17 APR 68	JK
Ⓜ	CS	REVISED PER TDRR 36031	24 APR 68	JK
	CT	REVISED PER TDRR 36319	17 JUN 68	JAC
Ⓜ	CU	REVISED PER TDRR 36323	21 JUN 68	JAC
	CV	REVISED PER TDRR 36420	3 JULY 68	JK JAC
Ⓜ	CW	REVISED PER TDRR 36424	5 JULY 68	JK JAC
	CY	REVISED PER TDRR 36745	4 SEPT 68	JK JAC
	CZ	REVISED PER TDRR 36753	9 SEPT 68	ML JAC
Ⓜ	DA	REVISED PER TDRR 36755	19 SEPT 68	SW JAC
	DB	REVISED PER TDRR 36856	30 SEPT 68	ML JAC

REV STATUS OF SHEETS																		
REV																		
SHEET																		
REV	DB			CH	CH	CW	CW	CV	CV	CZ	DB	DB	DB	DB	DB	DA	CV	CV
SHEET	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

A.METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-68

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 2

FORM 2064 REV 367

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 3

367

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MOV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MOV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 4

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CH	SHEET 5

FORM 2064 REV 367

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR CV		SHEET 6

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX.	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR CV		SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR CZ		SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	0512	1	1901492-041	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR DB		SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1170	05	234	19C0145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	19C2134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	19C2134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	19C2134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	29C0405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	19C1875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	19C1876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	19C2299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	29C0025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	19C1308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	19C1930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	19C1930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-C41	CABLE SET 100 SERIES	
1290	2	234	29C0712-011	CABLE SET SPECIAL BLK II	
1291	2	234	29C0712-021	CABLE SET SPECIAL BLK II	
1292	2	234	29C0712-031	CABLE SET SPECIAL BLK II	
1293	2	234	29C0712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	29C0712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	69C0043-011	CABLE SET,INTERCONN LEM	
1301	X	234	69C0043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	69C0043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
					NAA P2-IMU

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DB	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1310	051	1	19C1520	CABLE INTERCONN.	
1311	051	1	19C2625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	19C2602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	19C0802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	29C0070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	29C0066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	19C2301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	19C2204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	29C0067-011	G&N MTG, FIXTURE	
1437	12	34	29C0067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	29C0067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	19C1426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	19C1846-011	G&N HANDLING & SHIPPING FIXTUR	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DB	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1461	051	1 5	19C1846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	19C1846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	19C0010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	19C0010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	19C0009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	19C0009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	19C0009-C41	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	29C0998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	29C0999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	69C0129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	29C0677-011	MTG PLATE,COMP.BLK II	
1530	L	234	69C0007-011	MTG PLATE,COMP. LEM	
1531	LR	234	69C0007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	69C0083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	19C2371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	19C0804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	19C0299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	19C0299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	19C0797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	29C0708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	19C2431-011	PSA ADAPTER MODULE	
1601	1	1	19C2431-021	PSA ADAPTER MODULE	
1602	5	1	19C2431-031	PSA ADAPTER MODULE	
1603	1	1	19C2431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DB	SHEET 12

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1605	L	1	69C0088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	69C0088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	69C0088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	29C1143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	29C1143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	19C2430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	19C2430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	29C0065-021	CONN. COVER SET BLK II	
1650	X	1 5	69C0001-011	CONN. COVER SET LEM	
1651	X	1 5	69C0001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	29C1380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	29C1075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	29C1076-011	ADAPTER SET BLK II	
1672	2	234	29C1076-021	ADAPTER SET BLK II	
1673	12	234	29C1074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	19C2545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	29C0895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	29C0895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	19C2654-011	COVER, APOLLO SEXTANT	
1700	XX	1	19C2651-011	COVER, APOLLO OPTICAL	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DB	SHEET 13

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	29C1628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DA	SHEET 14	

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CV	SHEET 15	

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CV	SHEET 16	

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APPLICATION	
NEXT ASSY	USED ON
	Ⓜ
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
CH	REPLACES REV(CG) WITH CHANGE, PER TDRR 35540	8 FEB 68	JRK
CJ	REVISED PER TDRR 35632 WAS 15 SHEETS	1 MAR 68	JRK JAC
CK	REVISED PER TDRR 35637	5 MAR 68	JJJ
CL	REVISED PER TDRR 35638	6 MAR 68	JJJ
CM	REVISED PER TDRR 35639	8 MAR 68	JJJ
Ⓜ CN	REVISED PER TDRR 35707	11 MAR 68	JJJ
CP	REVISED PER TDRR 35797	21 MAR 68	JJJ
CR	REVISED PER TDRR 35973	17 APR 68	JK
Ⓜ CS	REVISED PER TDRR 36031	24 APR 68	JK
CT	REVISED PER TDRR 36319	17 JUN 68	JAC
Ⓜ CU	REVISED PER TDRR 36323	21 JUN 68	JAC
CV	REVISED PER TDRR 36420	3 JULY 68	JK JAC
Ⓜ CW	REVISED PER TDRR 36424	5 JULY 68	JK JAC
CY	REVISED PER TDRR 36745	4 SEPT 68	JK JAC
CZ	REVISED PER TDRR 36753	9 SEPT 68	ML JAC
Ⓜ DA	REVISED PER TDRR 36755	19 SEPT 68	SW JAC
Ⓜ DB	REVISED PER TDRR 36856	30 SEPT 68	ML JAC
DC	REVISED PER TDRR 37285	31 JAN 69	MTY RWH

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	DC	CH	CH	CW	CW	CV	CV	CZ	DB	DB	DB	DB	DB	DA	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G.PUKK 2 FEB 65
ENGINEER H.BRINKMAN
APPROVAL C.SPERLING
CONTR NO.

A.METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G&N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

FORM 2084 REV. 367

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

367

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CW	SHEET 4

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KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CW	SHEET 5

FORM 2084 REV. 367

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	0512L	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	0512	1	1901492-041	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	

NAA P2-IMU

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1310	051	1	1901520	CABLE INTERCONN.	
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	

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A	80230	APOLLO G&N GSE 1900030
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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL	

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DC	SHEET 16

FORM 2084 REV. 367

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11FEB 69	SA

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	DD	CH	CH	CW	CW	CV	CV	CZ	DD	DD	DD	DD	DD	DD	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

R JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2FEB65
NASA APPROVAL
W. KUPFER 2 FEB65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPABILITY 0512LR	PART NUMBER.	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 2

FORM 2084 REV. 367

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CH	SHEET 3

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022468	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CW	SHEET 4

FORM 2084 REV. 367

KOLLSMAN

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CW	SHEET 5

FORM 2084 REV. 367

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 6

FORM 2084 REV. 367

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 7

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CZ	SHEET 8

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900232	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DD	SHEET 9

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 6	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR DD
SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900058	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900063	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900564-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900600-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 6	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR DD
SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900603-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900604-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR DD
SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	

SIZE A
CODE IDENT NO. 80230
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1900030
SCALE-NONE
REV LTR DD
SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DD	SHEET 14

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 15

APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	~~CV~~ DC	SHEET 16

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	DE	CH	CH	CW	DE	CV	CV	CZ	DD	DD	DD	DD	DD	DD	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

R. JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CH
SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	[illegible]	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	0512	8	1017375-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CH
SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CH
SHEET 4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY, STORAGE	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR ~~CH~~ DE
SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 6

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 7

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CZ	SHEET 8

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DD	SHEET 9

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DD	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DD	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DD	SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DD	SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DD	SHEET 14

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 15

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR ~~CV~~ DC	SHEET 16

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		DD	REVISED PER TDRR 37307	11FEB 69	SA
		DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
1000000		DF	REVISED PER TDRR 37352	24 FEB 69	JJJ

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	DF	CH	DF	CW	DE	CV	CV	CZ	DD	DD	DD	DD	DD	DD	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 2

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KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	ACT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	~~0512~~ XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
181	0512	8	1017376-011	WEDGE, VARIABLE DEVIATION	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DF ~~CK~~	SHEET 3

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KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022960-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022465	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CW	SHEET 4

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KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY, STORAGE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	~~CE~~ DE	SHEET 5

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RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 6

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RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CZ	SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DD	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DD	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DD	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DD	SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1669	12L	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DD	SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DD		SHEET 14

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CV		SHEET 15

FORM 2084 REV. 367

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR ~~CV~~ DC		SHEET 16

FORM 2084 REV. 367

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		DD	REVISED PER TDRR 37307	11FEB 69	SA
		DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
1000000		DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
		DG	REVISED PER TDRR 37504	15 APR 69	JJJ

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	DG	CH	DF	CW	DE	CV	CV	CZ	DD	DD	DD	DD	DG	DG	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE. MASS.

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N

GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	~~0512~~	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
181	0512	8	1017376-011	WEDGE, VARIABLE DEVIATION	
	XXXX				

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DF ~~CX~~	SHEET 3

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019846-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014008-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022465	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CW	SHEET 4

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY, STORAGE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	~~CX~~ DE	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 6

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CZ	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DD	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DD		SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG. FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DD		SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DD		SHEET 12

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DG		SHEET 13

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DG	SHEET 14

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019986-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 15

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APPENDIX

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DC	SHEET 16

FORM 2084 REV. 367

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
		DD	REVISED PER TDRR 37307	11FEB 69	SA
		DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
1000000		DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
		DG	REVISED PER TDRR 37504	15 APR 69	JJJ
		DH	REVISED PER TDRR 37549	2 MAY 69	JJJ

REV																	
SHEET																	
REV STATUS OF SHEETS	REV	DH	CH	DF	CW	DE	CV	CV	CZ	DD	DD	DD	DD	DG	DH	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

M I T
INSTRUMENTATION LAB
CAMBRIDGE, MASS

R. JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030

SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO. | CAPA-BILITY 0512LR | PART NUMBER | TITLE | MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CH		SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
~~151~~	~~0512L~~	~~5~~	~~1017447-011~~	~~THEODOLITE AND SUPPORT ASSY~~	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	~~0512~~ XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
181	0512	8	1017376-011	WEDGE, VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DF CK		SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014008-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022465	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CW		SHEET 4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY, STORAGE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR ~~CE~~ DE		SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512l	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 6

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CV	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CZ	SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DD	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	

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SCALE-NONE	REV LTR DD	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	

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SCALE-NONE	REV LTR DD	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DD	SHEET 12

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DG	SHEET 13

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE OUA ENVIRONMENTAL	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR DH ~~DG~~		SHEET 14

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR CV		SHEET 15

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR ~~CV~~ DC		SHEET 16

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
DG	REVISED PER TDRR 37504	15 APR 69	JJJ
DH	REVISED PER TDRR 37549	2 MAY 69	JJJ
DJ	REVISED PER TDRR 37818	23 SEP 69	

REV STATUS OF SHEETS	REV	DJ	CH	DF	CW	DE	CV	CV	CZ	DJ	DJ	DJ	DJ	DJ	DJ	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO. | CAPA-BILITY 0512LR | PART NUMBER | TITLE | MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CH	SHEET 2	

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASS	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIM	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	~~0512~~ XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
181	0512	8	1017376-011	WEDGE, VARIABLE DEVIATION	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR DF CK	SHEET 3	

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019846-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR CW	SHEET 4	

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
410	L	3	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY, STORAGE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR ~~CE~~ DE	SHEET 5	

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	
572	12L	4 6	2014268-021	INTERCONN.SET S/S	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 6

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RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	2L	234	2900024-011	GROUND DISTRIB BOX	
1061	2LR	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	0	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	5	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CZ	SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	5	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	1	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	051	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	051	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	0512L	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	051	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	2L	234	2900037-011	PSA TEST POINT ADAPTER	
1143	2LR	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DJ	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	12L	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	12LR	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	5	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	1	234	2900713-011	CABLE SET 100 SERIES	
1281	1	234	2900713-021	CABLE SET 100 SERIES	
1282	1	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	2	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	2	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	2	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	2	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	2	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	2	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DJ	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	L	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	2LR	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	2L	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	2	34	2900067-011	G&N MTG, FIXTURE	
1437	12	34	2900067-021	G&N MTG. FIXTURE	
1438	12	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	12	34	2900067-041	G&N MTG FIXTURE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DJ	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	05	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	051	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	0512L	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	2	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	2L	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	0512LR	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	0 1	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DJ	SHEET 12

AC ELECTRONICS

ITEM NO.	CAPABILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	5	1	1902431-011	PSA ADAPTER MODULE	
1601	1	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	1	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	L	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	L	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	2	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	2	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1612	2	1	2901143-031	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	1	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	2	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	2	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DJ	SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE OUA ENVIRONMENTAL	

[redacted]

SIZE	CODE IDENT NO.	
A	80230	1900030
SCALE-NONE	REV LTR DJ	SHEET 14

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 15

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR ~~CV~~ DC	SHEET 16

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
DG	REVISED PER TDRR 37504	15 APR 69	JJJ
DH	REVISED PER TDRR 37549	2 MAY 69	JJJ
DJ	REVISED PER TDRR 37818	23 SEP 69	
DK	REVISED PER TDRR 37842	6 OCT 69	PHG RWH

REV STATUS OF SHEETS REV	DK	CH	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	CV	DC
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR CH
SHEET 2

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASSY	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIMU	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
181	0512	8	1017376-011	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR DK
SHEET 3

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM ACT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR DK
SHEET 4

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	
410	L	5	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY STORAGE	

SIZE A
CODE IDENT NO. 80230
APOLLO G&N GSE
1900030
SCALE-NONE
REV LTR DK
SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 6

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	XX	234	2900024-011	GROUND DISTRIB BOX	
1061	XXX	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	X	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	X	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	X	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	X	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	XXX	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	XXX	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	XXXXX	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	XXX	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	XX	234	2900037-011	PSA TEST POINT ADAPTER	
1143	XXX	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1150	2L	234	2900143-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	XXX	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	XXXX	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	X	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	X	234	2900713-011	CABLE SET 100 SERIES	
1281	X	234	2900713-021	CABLE SET 100 SERIES	
1282	X	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	X	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	X	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	X	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	X	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	X	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	X	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DK	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	X	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	XXX	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	XX	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462-011	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	X	34	2900067-011	G&N MTG, FIXTURE	
1437	XX	34	2900067-021	G&N MTG. FIXTURE	
1438	XX	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	XX	34	2900067-041	G&N MTG FIXTURE	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DK	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	XX	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	XXX	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	XXXXX	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	X	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	XX	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	XXXXXX	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	X X	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DK	SHEET 12

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	X	1	1902431-011	PSA ADAPTER MODULE	
1601	X	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	X	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	X	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	X	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	X	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	X	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1612	2	1	2901143-031	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-CUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	2L	1	1021616	JUMPER BY PASS (BLK II)	
1630	X	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	X	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	X	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	

SIZE A	CODE IDENT NO. 80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DK	SHEET 13

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
DG	REVISED PER TDRR 37504	15 APR 69	JJJ
DH	REVISED PER TDRR 37549	2 MAY 69	JJJ
DJ	REVISED PER TDRR 37818	23 SEP 69	
DK	REVISED PER TDRR 37842	6 OCT 69	PHG RWH
DL	REVISED PER TDRR 38163	17 JUN 70	M.G. CP

REV STATUS OF SHEETS																	
REV	DL	CH	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DL	DL	CV	DC
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT INSTRUMENTATION LAB
CAMBRIDGE. MASS

R. JONES 22 JAN 65
DRAFTSMAN DAY MO YR
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

A. METZGER 2 FEB 65
NASA APPROVAL
W. KUPFER 2 FEB 65
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASSY	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIMU	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
181	0512	8	1017376-011	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	DK	SHEET 3

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	DK	SHEET 4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	
410	L	5	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY STORAGE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE	1900030
SCALE-NONE	REV LTR	DK	SHEET 5

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 6

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RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 7

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	XX	234	2900024-011	GROUND DISTRIB BOX	
1061	XXX	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	X	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	X	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 8

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	X	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	X	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	XXX	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	XXX	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	XXXXX	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	XXX	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	XX	234	2900037-011	PSA TEST POINT ADAPTER	
1143	XXX	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 9

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	XXX	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	XXXX	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	X	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	X	234	2900713-011	CABLE SET 100 SERIES	
1281	X	234	2900713-021	CABLE SET 100 SERIES	
1282	X	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	X	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	X	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	X	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	X	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	X	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	X	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 10

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	X	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	XXX	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	XX	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462-011	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	X	34	2900067-011	G&N MTG, FIXTURE	
1437	XX	34	2900067-021	G&N MTG. FIXTURE	
1438	XX	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	XX	34	2900067-041	G&N MTG FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 11

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	XX	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	XXX	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	XXXXX	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	X	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	XX	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	XXXXXX	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	X X	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 12

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	X	1	1902431-011	PSA ADAPTER MODULE	
1601	X	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	X	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	X	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	X	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	X	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	X	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1612	2	1	2901143-031	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	XX	1	1021616	JUMPER BY PASS (BLK II)	
1622	2L	1	1021616-011	JUMPER BY PASS (BLK II)	
1630	X	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	X	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	X	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DL	SHEET 13

AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE OUA ENVIRONMENTAL	
1735		34	2901677	CABLE ASSEMBLY,SPECIAL PURPOSE W 183	
1736		34	2901678	CABLE ASSEMBLY,SPECIAL PURPOSE W 184	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DL	SHEET 14

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR CV	SHEET 15

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR ~~DL~~ DC	SHEET 16

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11 FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
DG	REVISED PER TDRR 37504	15 APR 69	JJJ
DH	REVISED PER TDRR 37549	2 MAY 69	JJJ
DJ	REVISED PER TDRR 37818	23 SEP 69	
DK	REVISED PER TDRR 37842	6 OCT 69	PHG RWH
DL	REVISED PER TDRR 38163	17 JUN 70	M.G. CP
DM	REVISED PER TDRR 38185	7-JUL-70	B. CP

REV STATUS OF SHEETS																	
REV STATUS OF SHEETS	REV	DM	CH	DK	DK	DK	DK	DK	DK	DK	DK	DK	DK	DL	DM	CV	DC
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE. MASS.

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = OSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	CH	SHEET 2

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	C DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASSY	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIMU	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
181	0512	8	1017376-011	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 3

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	ACT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 4

KOLLSMAN

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	
410	L	5	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY STORAGE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 5

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 6

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 7

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	XX	234	2900024-011	GROUND DISTRIB BOX	
1061	XXX	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	X	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	
1073	X	2 4	1901933-011	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 8

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1074	X	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	X	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	XXX	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	XXX	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	XXXXX	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	XXX	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	XX	234	2900037-011	PSA TEST POINT ADAPTER	
1143	XXX	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE	
A	80230	1900030	
SCALE-NONE	REV LTR	DK	SHEET 9

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	XXX	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	XXXX	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	X	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	X	234	2900713-011	CABLE SET 100 SERIES	
1281	X	234	2900713-021	CABLE SET 100 SERIES	
1282	X	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	X	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	X	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	X	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	X	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	X	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	X	234	2900712-061	CABLE SET SPECIAL BLK II	
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 10

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	X	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	XXX	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	XX	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462-011	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	X	34	2900067-011	G&N MTG, FIXTURE	
1437	XX	34	2900067-021	G&N MTG. FIXTURE	
1438	XX	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	XX	34	2900067-041	G&N MTG FIXTURE	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 11

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AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	XX	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	XXX	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	XXXXX	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	X	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	XX	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE C/M & LEM CDU ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	XXXXXX	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	X X	5	1900797-021	LOAD & SIGNAL SIMUL. SET	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 12

FORM 2084 REV. 367

AC ELECTRONICS

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	X	1	1902431-011	PSA ADAPTER MODULE	
1601	X	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	X	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	X	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	X	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	L	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1610	X	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	X	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1612	2	1	2901143-031	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	XX	1	1021616	JUMPER BY PASS (BLK II)	
1622	2L	1	1021616-011	JUMPER BY PASS (BLK II)	
1630	X	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	X	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	
1671	X	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DL	SHEET 13

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AC ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE OUA ENVIRONMENTAL	
1735		34	2901677	CABLE ASSEMBLY,SPECIAL PURPOSE W 183	
1736		34	2901678	CABLE ASSEMBLY,SPECIAL PURPOSE	
1737	2	1	2901693-011	FIXTURE ASSEMBLY, I M U JUMPER BY-PASS	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DM	SHEET 14

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31050)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR CV	SHEET 15

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APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.	
A	80230	APOLLO G&N GSE 1900030
SCALE-NONE	REV LTR DC	SHEET 16

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APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11 FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
DG	REVISED PER TDRR 37504	15 APR 69	JJJ
DH	REVISED PER TDRR 37549	2 MAY 69	JJJ
DJ	REVISED PER TDRR 37818	23 SEP 69	
DK	REVISED PER TDRR 37842	8 OCT 69	PHG RWH
DL	REVISED PER TDRR 38163	17 JUN 70	M.G. CP
DM	REVISED PER TDRR 38185	7-JUL-70	B. CP
DN	REVISED PER TDRR 38214	10 SEP 70	

REV STATUS OF SHEETS																
REV	DN	CH	DK	DK	DK	DK	DK	DN	DN	DN	DN	DN	DN	DN	CV	DC
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.
NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 16

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	CH	SHEET 2

FORM 2084 REV. 367

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASSY	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIMU	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
181	0512	8	1017376-011	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DK	SHEET 3

FORM 2084 REV. 367

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022980-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DK	SHEET 4

FORM 2084 REV. 367

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	
410	L	5	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY STORAGE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DK	SHEET 5

FORM 2084 REV. 367

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 6

FORM 2084 REV. 367

RAYTHEON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DK	SHEET 7

FORM 2084 REV. 367

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1008	12LR	234	2900022-061	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	XX	234	2900024-011	GROUND DISTRIB BOX	
1061	XXX	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	X	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DN	SHEET 8

FORM 2084 REV. 367

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1073	X	2 4	1901933-011	GSE PSA J-BOX	
1074	X	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	X	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	XXX	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	XXX	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	XXXXX	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	XXX	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	XX	234	2900037-011	PSA TEST POINT ADAPTER	
1143	XXX	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	

SIZE	CODE IDENT NO.	APOLLO G&N GSE
A	80230	1900030
SCALE-NONE	REV LTR DN	SHEET 9

FORM 2084 REV. 367

DELCO ELECTRON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE OUA ENVIRONMENTAL	
1735		34	2901677	CABLE ASSEMBLY,SPECIAL PURPOSE W 183	
1736		34	2901678	CABLE ASSEMBLY,SPECIAL PURPOSE	
1737	2	1	2901693-011	FIXTURE ASSEMBLY, I M U	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030
SCALE-NONE | REV LTR DN | SHEET 14

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030
SCALE-NONE | REV LTR CV | SHEET 15

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9PART OF ITEM 19 LTC		GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9 ITEM PART OF ITEM 9			
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE | 1900030
SCALE-NONE | REV LTR ~~DN~~ DC | SHEET 16

APPLICATION	
NEXT ASSY	USED ON
1000000	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
DD	REVISED PER TDRR 37307	11 FEB 69	SA
DE	REVISED PER TDRR 37334	14 FEB 69	JJJ
DF	REVISED PER TDRR 37352	24 FEB 69	JJJ
DG	REVISED PER TDRR 37504	15 APR 69	JJJ
DH	REVISED PER TDRR 37549	2 MAY 69	JJJ
DJ	REVISED PER TDRR 37818	23 SEP 69	JJC
DK	REVISED PER TDRR 37842	6 OCT 69	PHG RWH
DL	REVISED PER TDRR 38163	17 JUN 70	M.G. CP
DM	REVISED PER TDRR 38185	7-JUL -70	B. CP
DN	REVISED PER TDRR 38214	10 SEP 70	JJC
DP	REVISED PER TDRR 38285	25 Nov 70	DKD CP

REV																		
SHEET																		
REV STATUS OF SHEETS	REV	DP	CH	DK	DK	DK	DK	DK	DN	DN	DN	DN	DN	DP	DP	DP	DP	DP
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

REFERENCE: ACSK ONLY

MIT
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAFTSMAN R. JONES 22 JAN 65 (DAY MO YR)
CHECKER G. PUKK 2 FEB 65
ENGINEER H. BRINKMAN
APPROVAL C. SPERLING
CONTR NO.

NASA APPROVAL A. METZGER 2 FEB 65
MIT APPROVAL W. KUPFER 2 FEB 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

SIZE A
CODE IDENT. NO 80230
1900030
SCALE NONE
SHEET 1 OF 17

MIL 1377A6 12-65

GLOSSARY

ITEM NO.	CAPA-BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.

GLOSSARY

A. CAPABILITIES

0 = BLOCK I SERIES 0
5 = BLOCK I SERIES 50
1 = BLOCK I SERIES 100
2 = BLOCK II
L = LEM
R = LORS
X = OBSOLETE DESIGN FOR COLUMN INDICATED

B. TEST CONFIGURATION

1 = POST INSTALLATION
2 = ISS INERTIAL SUB-SYSTEM TEST
3 = G&N TEST
4 = UNIVERSAL TEST STATION
5 = G&N SUPPORT EQUIPMENT
6 = CSS COMPUTER SUB-SYSTEM TEST
7 = R&I (RECEIVING & INSPECTION - OPTICS)
8 = OSS OPTICAL SUB-SYSTEM TEST

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR CH | SHEET 2

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
10	XX	7	1016910-000	PRECISION TEST FIXTURE ASSY	
11	0512	7	1016910-011	PRECISION TEST FIXTURE ASSY	
20	0512	7	1022962-011	AUX PTF STAND	NOT END ITEM
30	XX	7	1022942-000	PTF CALIBRATION KIT	NOT END ITEM
31	0512	7	1022942-011	PTF CALIBRATION KIT	NOT END ITEM
40	XX	7	1016949-000	FUNCTIONAL TESTER ASSY	
41	XXXX	7	1016949-011	FUNCTIONAL TESTER ASSY	
42	051X	7	1016949-021	FUNCTIONAL TESTER ASSY	
43	0512	7	1016949-031	FUNCTIONAL TESTER ASSY	
50	0512	8	1019769-000	SHAFT ACCURACY TESTER	
60	L	7	6014003-011	AOT TESTER ASSY	
70	051	8	1016951-000	ALIGNMENT MIRROR ASSY	
80	XXX	7	1017387-000	CERT FIXTURE, ALLIGNMENT	
81	051	7	1017387-011	CERT FIXTURE,ALLIGNMENT	
90	0512	3 8	1017380-000	0 DEGREE AUTOCOLL. PLATE ASSY	
100	0512	3 8	1017381-000	45 DEGREE AUTOCOLL. PLATE ASSY	
110	XX		1017382-000	AZIMUTH REF FIXTURE	OBSOLETE
111	XX	1	1017382-011	AZIMUTH REF FIXTURE	OBSOLETE
120	XX	1	1017383-000	G&N INSTALL.QUAL.FIXTURE	
121	XXXX	1	1017383-011	G&N INSTALL.QUAL.FIXTURE	
122	0512	1	1017383-021	G&N INSTALLATION QUAL FIXTURE	
130	0512	7	1019760-000	FIXTURE ASSY CERTIFICATION	
140	0512	1	1021640-000	LIFTING FIX.G&N QUAL.AND AZIMU	MIT BUILT
150	0512L	5	1017447-000	THEODOLITE AND SUPPORT ASSY	
151	0512L	5	1017447-011	THEODOLITE AND SUPPORT ASSY	
160	0512	8	1019758-000	TOOLING BAR ASSEMBLY	ACED ONLY
170	0512L	5	1019759-000	ADJ.MIRROR AND PEDESTAL ASSY.	
180	XXXX	8	1017376-000	WEDGE,VARIABLE DEVIATION	
181	0512	8	1017376-011	WEDGE,VARIABLE DEVIATION	
190	XX	1	1019837-000	PORTABLE LIGHT ASSEMBLY	SER NO 1-4

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR DK | SHEET 3

FORM 2284 REV. 1-67

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
191	XXXX	5	1019837-011	PORTABLE LIGHT ASSEMBLY	SER NO 5-9
192	0512	5	1019837-021	PORTABLE LIGHT ASSY	SER NO 5-9
193	0512	5	1019837-031	PORTABLE LIGHT ASSY	SER NO 1-4 USE WITH SXT ONLY
200	0512	3 8	1019840-000	RETROREFLECTING PRISM	
210	X	7	1016948-000	TESTER ASSY MDV	OBSOLETE
220	XX	1 3 78	1019977-011	STAR&HORIZON SIMULATOR	OBSOLETE
221	XX	1 3 78	1019977-021	STAR & HORIZON SIMULATOR	OBSOLETE
230	XX	7	1019970-011	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
231	XX	7	1019970-021	STAR & HORIZON SIMULATOR CERT. FIXTURE	OBSOLETE
240	XX		1019926-011	G&N FIXTURE STAND	OBSOLETE
250	0512L	5	1019984-011	OPTICS CLEANING KIT	
260	XX	5	1019720-000	OPTICS N/B SHIPPING CONT.	
261	XXXX	5	1019720-011	OPTICS N/B SHIPPING CONT.	
262	0512	5	1019720-021	OPTICS N/B SHIPPING CONT.	
270	XX		1019700-000	SHIPPING & STORAGE CONT.(OUA)	OBSOLETE
280	X		1019721-000	CASE ASSY STORAGE MDV	OBSOLETE
290	X	5	6014000-000	LEM AOT SHIPPING CONT.	
291	L	5	6014000-011	LEM AOT SHIPPING CONT.	
310	0512	5	1022960-011	OUA EYEPIECE AND LENS COVERS	
320	L	5	6014319-011	CONNECTOR COVERS AOT	
330	XX	5	1022963-011	STAR TRACKER COVERS ASSY	OBSOLETE
340	XXXX	5	1001844-004	SYSTEM CONN. COVERS	OBSOLETE
350	XXXX	5	1001844-005	CAP,PROTECTIVE WITH RETAINING RING	OBSOLETE
360	0512	5	1022787-011	CONN.COVER PROTECT (OUA)	
370	5	7	1022934-011	CABLE ASSY S.P. ELECTRICAL,W-17	USE WITH FUNCTIONAL TESTER
380	L	1	6014322	AOT PROTECTIVE DUST COVER	(SOURCE CONTROL DRAWING)
390	2	3 8	1022665	SPACER,AIR FOCUSING (SXT)	

SIZE A | CODE IDENT NO 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR DK | SHEET 4

KOLLSMAN

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
400	L	5	6014064-011	AOT SUNSHADE ALIGNMENT FIXTURE	
410	L	5	6014066-011	DUST COVER PROTECTIVE SUNSHADE ASSY	
420	L	5	6014306	COVER PROTECTIVE LENS	
430	L	5	6014307	COVER PROTECTIVE LENS	
440	L	5	6014329-011	AOT PROTECTIVE COVER	
450	0512	5	1022676	OUA CONTAINER ASSEMBLY STORAGE	

SIZE A | CODE IDENT NO. 80230 | APOLLO G&N GSE 1900030
SCALE-NONE | REV LTR DK | SHEET 5

RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
510	05	2	1014061	COMPUTER SIMULATOR	
511	051	2	1014061-011	COMPUTER SIMULATOR	
512	051	2	1014061-011	COMPUTER SIMULATOR (MOD 1)	
513	0512L	2	2014048-011	COMPUTER SIMULATOR	
520	0	34 6	1014156	AGC TEST SET	
521	051	34 6	1020341	AGC TEST SET	
522	12L	34 6	2014042-011	AGC TEST SET	
523	12L	34 6	2014042-021	AGC TEST SET	
524	12L	34 6	2014042-031	AGC TEST SET	
525	12L	34 6	2014042-041	AGC TEST SET	
526	12L	34 6	2014042-051	AGC TEST SET	
527	12L	34 6	2014042-061	AGC TEST SET	
528	12L	34 6	2014042-071	AGC TEST SET	
529	12L	34 6	2014042-081	AGC TEST SET	
530	05	34 6	1014217	AGC CALIBRATION CONSOLE	
531	051	34 6	1020344-011	AGC CALIBRATION CONSOLE	
532	12L	34 6	2014049-011	AGC CALIBRATION CONSOLE	
533	12L	34 6	2014049-021	AGC CALIBRATION CONSOLE	
540	12L	34 6	2014059-011	AUX AGC CALIBR.CONSOLE	
541	12L	34 6	2014059-021	AUX AGC CALIBRATION CONSOLE	
550	0	4 6	1014465	OPERATION CONSOLE	
551	051	4 6	1020342	OPERATION CONSOLE	
552	12L	4 6	2014024-011	OPERATION CONSOLE	
553	12L	4 6	2014024-021	OPERATION CONSOLE	
560	05	34	1020195	MAIN DSKY PEDESTAL MOUNT	
561	051	34	1020343	MAIN DSKY PEDESTAL MOUNT	
562	051	34	1020343-011	MAIN DSKY PEDESTAL MOUNT	
563	051	34	1020343-021	MAIN DSKY PEDESTAL MOUNT	
564	12L	34	2014014-011	MAIN DSKY PEDESTAL MOUNT	
570	051	4 6	1020312	INTERCONN.KIT SUB-SYSTEM	
571	12L	4 6	2014268-011	INTERCONN.SET SUB-SYSTEM	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DK	SHEET 6

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RAYTHEON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
572	12L	4 6	2014268-021	INTERCONN.SET S/S	
573	12L	4 6	2014268-031	INTERCONN. SET SUB-SYSTEM	
580	051	34 6	1020313	INTERCONN.KIT SYSTEM	
581	12L	34 6	2014255-011	INTERCONN.SET SYSTEM	
582	12L	34 6	2014255-021	INTERCONN. SET SYSTEM	
583	12L	34 6	2014255-031	INTERCONN. SET SYSTEM	
584	12L	34 6	2014255-041	INTERCONN. SET SYSTEM	
590	0	1	1020225	ALIGNMENT FIXT.NAV. DSKY	
600	0	5	1020001-001	HANDLING FIXTURE AGC	
601	0	5	1020001-002	HANDLING FIXTURE AGC	
602	51	5	1020001-003	HANDLING FIXTURE AGC	
603	51	5	1020001-004	HANDLING FIXTURE AGC	
604	51	5	1020001-005	HANDLING FIXTURE AGC	
607	XX	5	2014282-011	HANDLING FIXTURE AGC	
608	XX	5	2014282-021	HANDLING FIXTURE AGC	
609	2L	5	2014282-031	HANDLING FIXTURE AGC	
610	051	5	1014377	HANDLING FIXT.MAIN DSKY	
611	051	5	1014377-011	HANDLING FIXT.MAIN DSKY	
620	051	5	1014334	HANDLING FIXTURE.NAV. DSKY	
621	051	5	1014334-011	HANDLING FIXT.NAV. DSKY	
630	051	5	1006230	SHIPPING CONTAINER AGC	UPDATED TO ITEM 0631
631	2L	5	1006421	SHIPPING CONTAINER AGC	
640	051	5	1006229	SHIPPING CONTAINER MAIN DSKY	
650	051	5	1006231	SHIPPING CONTAINER NAV. DSKY	
660	0	5	1020339	MOUNTING KIT AGC (BLK I)	
661	51	5	1020338	MOUNTING KIT AGC (100 SERIES)	
670	2L	5	1006422	SHIPPING CONTAINER, UNIVERSAL	
680	2L	5	2014013-011	HANDLING FIXT.,UNIVERSAL DSKY	
700	2L	5	2016318-011	AGC CONN.COVER GROUP	
701	2L	5	2016318-021	AGC CONN.COVER GROUP	
710	2L	7	2014399	CONNECTOR COVER KIT BLKII	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DK	SHEET 7

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DELCO ELECTRON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1000	0	234	1900005-011	OPTIC INERTIAL TEST SET	
1001	05	234	1900005-021	OPTIC INERTIAL TEST SET	
1002	051	234	1902300-011	OPTIC INERTIAL TEST SET	
1003	XXX	234	2900022-011	OPTIC INERTIAL TEST SET	
1004	XXXX	234	2900022-021	OPTIC INERTIAL TEST SET	
1005	XXXX	234	2900022-031	OPTIC INERTIAL TEST SET	
1006	XXXX	234	2900022-041	OPTIC INERTIAL TEST SET	
1007	12LR	234	2900022-051	OPTIC INERTIAL TEST SET	
1008	12LR	234	2900022-061	OPTIC INERTIAL TEST SET	
1010	0	234	1900004-011	OPTICS INERTIAL ANALYZER	
1011	05	234	1900004-021	OPTICS INERTIAL ANALYZER	
1012	051	234	1901976-011	OPTICS INERTIAL ANALYZER	
1013	XXX	234	2900023-011	OPTICS INERTIAL ANALYZER	
1014	XXXX	234	2900023-021	OPTICS INERTIAL ANALYZER	
1015	XXXX	234	2900023-031	OPTICS INERTIAL ANALYZER	
1016	XXXX	234	2900023-041	OPTICS INERTIAL ANALYZER	
1017	12LR	234	2900023-051	OPTICS INERTIAL ANALYZER	
1020	0512LR	234	1900000-011	OSCILLOGRAPH CONSOLE	
1021	0512LR	234	1900000-021	OSCILLOGRAPH CONSOLE	
1030	0512	234 8	1900926-011	ROTARY TABLE ASSEMBLY	
1031	0512LR	234 8	1900926-021	ROTARY TABLE ASSEMBLY	
1040	0512LR	5	1900810-011	ROTARY TABLE CAL SET	
1050	0		1900433-011	GSE J-BOX OVERHEAD	
1051	05	234	1900433-021	GSE J-BOX OVERHEAD	
1052	051		1901959-011	GSE J-BOX OVERHEAD	
1060	XX	234	2900024-011	GROUND DISTRIB BOX	
1061	XXX	234	2900024-021	GROUND DISTRIB BOX	
1062	2LR	234	2900024-031	GROUND DISTRIB BOX	
1070	X	2 4	1900268-011	GSE PSA J-BOX	
1071	0	2 4	1900268-021	GSE PSA J-BOX	
1072	0 1	2 4	1900268-031	GSE PSA J-BOX	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DN	SHEET 8

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DELCO ELECTRON

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1073	X	2 4	1901933-011	GSE PSA J-BOX	
1074	X	2 4	1901933-021	GSE PSA J-BOX	PART OF 1901930
1075	5	2 4	1901933-031	GSE PSA J-BOX	PART OF 1901930
1076	X	2 4	1902195-011	GSE PSA J-BOX	
1077	1	2 4	1902195-021	GSE PSA J-BOX	
1080	XXX	1 5	1900342-011	INERTIAL COMP.TEMP.CONT.	
1081	XXX	1 5	1900342-021	INERTIAL COMP.TEMP.CONT.	
1082	XXXXX	1 5	1900342-031	INERTIAL COMP. TEMP CONT.	
1083	XXXXX	1 5	1900342-041	INERTIAL COMP. TEMP. CONT.	
1084	0512L	1 5	1900342-051	INERTIAL COMP. TEMP. CONT.	
1090	XX	1	1901492-011	AUX BATTERY PACK	
1091	XXXX	1	1901492-021	AUX BATTERY PACK	
1092	XXXX	1	1901492-031	AUX BATTERY PACK	
1093	XXXX	1	1901492-041	AUX BATTERY PACK	
1094	0512	1	1901492-051	AUX BATTERY PACK	
1100	XX	1	2900063-011	LIFTING TEMP CONTROLLER	
1101	XX	1	2900063-021	LIFTING TEMP. CONTROLLER	
1102	2L	1	2900063-031	LIFTING TEMP. CONTROLLER	
1110	XX	1 5	2900060-011	PORTABLE TEMP CONTROLLER	
1111	XX	1 5	2900060-021	PORTABLE TEMP CONTROLLER	
1112	2L	1 5	2900060-031	PORTABLE TEMP CONTROLLER	
1120	XX		2900228	PTC INTERFACE BLK II/LEM	REF DOCUMENT
1121	2L		2901644	PTC INTERFACE BLKII/LEM	REF DOCUMENT
1125	12L	1 5	2900222	ICTC INTERFACE	REF DOCUMENT
1130	XXX	234	1900805-011	PSA TRAY EXTENDER SET	
1131	051	234	1900805-021	TRAY EXTENDER SET	
1140	05	234	1900931-011	PSA TEST POINT ADAPTER	
1141	051	234	1901981-011	PSA TEST POINT ADAPTER	
1142	XX	234	2900037-011	PSA TEST POINT ADAPTER	
1143	XXX	234	2900037-021	PSA TEST POINT ADAPTER	
1144	2LR	234	2900037-031	PSA TEST POINT ADAPTER	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DN	SHEET 9

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DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1150	2L	234	2900145-011	PTA/PEA TEST PT ADAPATER	
1160	05	4 8	1900491-011	REMOTE OPTICS CONTROLLER	
1161	1	4 8	1902046-011	REMOTE OPTICS CONTROLLER	
1162	12	4 8	1902046-021	REMOTE OPTICS CONTROLLER	
1170	05	234	1900145-011	G&N COOLANT & PWR CONSOLE	
1171	051	234	1902134-011	G&N COOLANT & PWR CONSOLE	
1172	12L	234	1902134-021	G&N COOLANT & PWR CONSOLE	
1173	12LR	234	1902134-031	G&N COOLANT & PWR CONSOLE	
1174	12LR	234	1902134-041	G&N COOLANT & PWR CONSOLE	
1180	0512LR	234 8	2900405-011	HOSE SET GSE COOLANT INTERCON	
1181	0512LR	234 8	2900405-021	HOSE SET GSE COOLANT INTERCON	
1190	051	2 8	1901875-011	HOSE SET,GSE COOLANT INTERFACE	
1200	051	34	1901876-011	HOSE SET,GSE COOLANT INTERFACE	
1240	051	234 8	1902299-011	CABLE,SET,INTERCONN., BASIC	
1241	XXX	234 8	2900025-011	CABLE,SET,INTERCONN.,BASIC	
1242	XXXX	234 8	2900025-021	CABLE,SET,INTERCONN.,BASIC	
1243	12LR	234 8	2900025-031	CABLE,SET,INTERCONN.,BASIC	
1250	05	234 8	1900740-011	GSE TO GSE INTERCONN. CABLES	
1260	05	234 8	1901308-011	GSE TO GN INTERCONNECTOR CABLE	
1270	X	234	1901930-011	INTERCONN. ADAPTER SET	SEE ITEMS 1073 TO 1075
1271	5	234	1901930-021	INTERCONN.ADAPTER SET	SEE ITEMS 1073 TO 1075
1280	X	234	2900713-011	CABLE SET 100 SERIES	
1281	X	234	2900713-021	CABLE SET 100 SERIES	
1282	X	234	2900713-031	CABLE SET 100 SERIES	
1283	1	234	2900713-041	CABLE SET 100 SERIES	
1290	X	234	2900712-011	CABLE SET SPECIAL BLK II	
1291	X	234	2900712-021	CABLE SET SPECIAL BLK II	
1292	X	234	2900712-031	CABLE SET SPECIAL BLK II	
1293	X	234	2900712-041	CABLE SET SPECIAL BLK II	
1294	X	234	2900712-051	CABLE SET SPECIAL BLK II	
1295	X	234	2900712-061	CABLE SET SPECIAL BLK II	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DN	SHEET 10

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1296	2	234	2900712-071	CABLE SET SPECIAL BLK II	
1300	X	234	6900043-011	CABLE SET,INTERCONN LEM	
1301	X	234	6900043-021	CABLE SET,INTERCONN LEM	
1302	X	234	6900043-031	CABLE SET,INTERCONN LEM	
1303	X	234	6900043-041	CABLE SET INTERCONN LEM	
1304	L	234	6900043-051	CABLE SET,INTERCONN LEM	
1310	051	1	1901520	CABLE INTERCONN.	NAA P2-IMU
1311	051	1	1902625	CABLE INTERCONNECT W103	NAA P2-IMU
1320	2L	1	2900858	CABLE ASSY W 193	LIFTING BATTERY PACK TO PTC
1330	2L	1	2900863	CABLE ASSY W-198	NAA CABLE TO BLK II IMU
1340	051	1	1902602	CABLE,SPECIAL W-111	NAA P2 TO PSA TRAY 7
1350	0512LR	34	1900364-061	BLANK PANEL ASSY	
1360	051	2 4	1900012-011	IMU MOUNTING FIXTURE	
1361	XXX	2 4	2900000-011	IMU MOUNTING FIXTURE	
1362	2LR	2 4	2900000-021	IMU MOUNTING FIXTURE	
1370	051	5	1900800-011	IMU MTG ALIGN CALIBRATION TOOL	
1380	0512LR	1 5	1900802-011	IMU SNAP-ON BELLOWS	
1390	2L	234	2900070-011	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1391	2LR	234	2900070-021	FIXTURE,MTG,SUB-SYSTEM	3 IN LEM ONLY
1400	XX	234	2900066-011	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1401	2L	234	2900066-021	PTA/PEA MTG FIXTURE	3 IN LEM ONLY
1410	0512LR	5	1015462-011	IMU LIFTING FIXTURE	
1420	05	34 8	1900013-011	OPTIC/NB,MTG,FIXTURE	
1421	051	34 8	1902301-011	OPTIC/NB,MTG,FIXTURE	
1422	12	34 8	2900072-011	OPTIC/NB,MTG,FIXTURE	
1430	0	34	1900014-011	G&N MTG,FIXTURE	
1431	051	34	1902204-011	G&N MTG,FIXTURE	
1433	1	34	1902204-021	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1436	X	34	2900067-011	G&N MTG, FIXTURE	
1437	XX	34	2900067-021	G&N MTG. FIXTURE	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DN	SHEET 11

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1438	XX	34	2900067-031	G&N MTG. FIXTURE	QUAL TEST CHANGE (ECP-270)
1439	XX	34	2900067-041	G&N MTG FIXTURE	
1440	12	34	2900067-051	G&N MTG FIXTURE	
1441	12	34	2900067-061	G&N MTG FIXTURE	
1442	0	2 4	1900606-011	PSA MOUNTING FIXTURE	
1443	051	2 4	1900606-021	PSA MOUNTING FIXTURE	
1450	051	1 5	1901426-011	NB/OPTX HANDLING AND INSTALL.	
1460	XX	1 5	1901846-011	G&N HANDLING & SHIPPING FIXTUR	
1461	XXX	1 5	1901846-021	G&N HANDLING & SHIPPING FIXTUR	
1462	051	1 5	1901846-031	G&N HANDLING & SHIPPING FIXTUR	
1470	051	1 5	1900010-011	IMU SHIPPING CONTAINER	
1471	0512LR	1 5	1900010-021	IMU SHIPPING CONTAINER	
1480	0	1 5	1900009-011	TRANSPORTATION CART,G&N	
1481	051	1 5	1900009-021	TRANSPORTATION CART,G&N	
1482	XXXXX	1 5	1900009-031	TRANSPORTATION CART,G&N	
1483	0512L	1 5	1900009-041	TRANSPORTATION CART,G&N	
1490	X	1 5	2900998-011	HANDLING FIXTURE,PSA	
1491	2	1 5	2900998-021	HANDLING FIXTURE PSA	
1500	XX	1 5	2900999-011	HANDLING FIXTURE,CDU	
1501	2L	1 5	2900999-021	HANDLING FIXTURE	
				C/M & LEM CDL ASSY	
1510	L	1 5	6900129-011	HANDLING FIXTURE LEM PSA	
1520	2	2 4	2900677-011	MTG PLATE,COMP.BLK II	
1530	L	234	6900007-011	MTG PLATE,COMP. LEM	
1531	LR	234	6900007-021	MTG PLATE,COMP.LEM	
1540	R	2 4	6900083-011	IMU PLATE ASSY IMU/PTA	FOR LORS INTEGRATION TEST
1550	XXXXXX	5	1900803-011	FILLING & PURGE FIXTURE	
1551	0512LR	5	1902371-011	FILLING & PURGE FIXTURE	
1560	0512LR	5	1900804-011	IMU PRESSURE SEAL TESTER	
1570	051	1 5	1900299-011	DEGAUSSER ASSY	
1571	0512LR	1 5	1900299-021	DEGAUSSER ASSY	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DN	SHEET 12

DELCO ELECTRON

ITEM NO.	CAPA-BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1580	05	5	1900797-011	LOAD & SIGNAL SIMUL. SET	
1581	X X	5	1900797-021	LOAD & SIGNAL SIMUL. SET	
1582	1	5	1900797-031	LOAD & SIGNAL SIMUL. SET	
1590	2LR	5	2900708-011	RESOLVER CIRCUIT TESTER	
1600	X	1	1902431-011	PSA ADAPTER MODULE	
1601	X	1	1902431-021	PSA ADAPTER MODULE	
1602	5	1	1902431-031	PSA ADAPTER MODULE	
1603	X	1	1902431-041	PSA ADAPTER MODULE	
1604	1	1	1902431-051	PSA ADAPTER MODULE	
1605	X	1	6900088-011	PSA ADAPTER MODULE(LEM)	
1606	X	1	6900088-021	PSA ADAPTER MODULE(LEM)	
1607	X	1	6900088-031	PSA ADAPTER MODULE(LEM)	
1608	L	1	6900088-041	PSA ADAPTER MODULE(LEM)	
1610	X	1	2901143-011	PSA ADAPTER MODULE (BLK II)	
1611	X	1	2901143-021	PSA ADAPTER MODULE(BLK II)	
1612	2	1	2901143-031	PSA ADAPTER MODULE(BLK II)	
1615	05	1	SK-C734132	BREAK-OUT BOX PSAAM BLK I	MIT BUILT
1620	051	1	1015419	JUMPER BY PASS (BLK I)	
1621	XX	1	1021616	JUMPER BY PASS (BLK II)	
1622	2L	1	1021616-011	JUMPER BY PASS (BLK II)	
1630	X	1 5	1902430-011	CONN. COVERS BLK I ISS	
1631	1	1 5	1902430-021	COVER SET,ELECTRICAL CONN.	BLOCK I
1640	X	1 5	2900065-011	CONN. COVER SET BLK II	
1641	2	1 5	2900065-021	CONN. COVER SET BLK II	
1650	X	1 5	6900001-011	CONN. COVER SET LEM	
1651	X	1 5	6900001-021	CONN. COVER SET LEM	
1652	L	1	6900001-031	CONN. COVER SET LEM	
1660	2	1 5	2901380-011	OPTICS INSTALLATION HANDLING F	
1668	12L	234	2901075-031	BREAKOUT BOX CABLE ADPT SET	
1669	XXX	234	2901075-021	BREAKOUT BOX CABLE ADPT SET	
1670	XXX	234	2901075-011	BREAKOUT BOX/CABLE SET BASIC	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DP	SHEET 13

DELCO ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1671	X	234	2901076-011	ADAPTER SET BLK II	
1672	2	234	2901076-021	ADAPTER SET BLK II	
1673	12	234	2901074-011	ADAPTER SET BLK II/100	
1674	L	234	6900077-011	ADAPTER SET LEM	
1675	1	234	1902545-011	ADAPTER SET 100	
1680	XXXX	234	2900895-011	CALIBRATION & TEST ASSY SCM/PS	
1681	XXXX	234	2900895-021	CALIBRATION&TEST ASSY SCM/PSAAM	
1682	XXXX	234	2900895-031	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1683	512L	234	2900895-041	CALIBRATION AND TEST ASSEMBLY SCM/P SAAM	
1691	12	1	1902654-011	COVER, APOLLO SEXTANT	
1700	XX	1	1902651-011	COVER, APOLLO OPTICAL TELESCOPE	
1701	12	1	1902651-021	COVER, APOLLO OPTICAL TELESCOPE	
1710	12	1	1902661-011	COVER,CROWN OPTICAL SEXTANT	
1720	12	1	1902659-011	COVER, CROWN OPTICAL TELESCOPE	
1724	2	3 8	2901628	PANEL,BLANK-LAMP RETAINER (STAR LIST AREA)	
1725	2	3 8	2901629	PANEL,BLANK-LAMP RETAINER (VERB/NOUN AREA)	
1726	0512LR	12345678	2901630-011	ETHYLENE GLYCOL CLEANING KIT	
1730	2	1	2901659-011	COVER SET PROTECTIVE QUA ENVIRONMENTAL	
1735		X	2901677	CABLE ASSEMBLY,SPECIAL PURPOSE W 183	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DR	SHEET 14

FORM 2084 REV. 367

DELCO ELECTRONICS

ITEM NO.	CAPA- BILITY 0512LR	TEST CONFIG 12345678	PART NO.	TITLE	REMARKS
1736		X	2901678	CABLE ASSEMBLY,SPECIAL PURPOSE W 184	
1737	2	1	2901693-011	FIXTURE ASSEMBLY, I M U JUMPER BY-PASS	
1738	2L	34	2901682-011	CABLE ASSEMBLY,SPECIAL PURPOSE-W183	ACED ONLY
1739	2L	34	2901683-011	CABLE ASSEMBLY,SPECIAL PURPOSE-W184	ACED ONLY

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DR	SHEET 15

FORM 2084 REV. 367

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
APPENDIX				
01	0512	1017383-011	G&N INSTALL. AND QUAL. FIXTURE	A-23-097
02	0512	1021640	LIFT.FIXT.QUAL.&AZ.REF.(MIT BUILT)	H-23-207
03	0512	1017447-011	THEODOLITE & SUPPORT ASSY.	A-23-079
04	0512	1019837-011	PORTABLE LIGHT ASSEMBLY	A-23-196
05	0512	1019984-011	OPTICS CLEANING KIT	S-23-104
06	0512	1019720-011	NB/OPTICS SHIPPING CONTAINER	H-23-186
07	L	6014000-011	AOT SHIPPING CONTAINER	
07	9	MODEL NO. H-23-128(GAEC LSC 420-11075)		
08	L	6014056-011	AOT LENS COVERS	A-23-112
09	0512	1022980	SCT/SXT LENS COVERS	A-23-166
10	L	6014012	AOT CONNECTOR COVER SET	H-23-194
11	0512	1001844-4	SYSTEM CONNECTOR COVERS	H-23-194
12	0512	1001844-5	SYSTEM CONNECTOR COVERS	H-23-194
13	051	1020225	ALIGNMENT FIXTURE AGC	H-23-042
14	2L	2016318-011	CONNECTOR COVER GROUP	H-23-208
15	2L	2014399	CONNECTOR COVER KIT BLK II	PART OF ITEM 1
15	94)			
16	1	1020423	CONNECTOR COVER KIT BLK I	H-23-208
17	051	1900342-021	I.C.T.C.	S-23-100
18	051	1901492-021	AUX.BATTERY PACK	S-23-101
19	2L	2900063-031	LIFTING TEMP.CONTROLLER	S-23-105
20	2L	2900060-031	PORT.TEMP.CONTROLLER(BLKII)	
20	9	MODEL NO. S-23-114(GAEC LSC 410-31058)		
21	051	1900805-011	PSA TRAY EXTENDER SET	A-23-100
22	0512	1019840	RETRO-REFLECTING PRISM	A-23-200
23	2	2901380-011	OPTICS INSTALL.HANDLING FIXT.ASSY.	A-23-252
24	051	1901520	CABLE INTERCONN.NAA P2-IMU(W103)	A-23-114
25	L	2900858	CABLE ASSY W-193	A-23-267
26	2	2900863	CABLE ASSY W-198	A-23-268
27	051	1902602	CABLE SPECIAL W-111	A-23-269
28	0512L	1900802-011	IMU SNAP-ON BELLOWS	A-23-104

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DP	SHEET 16

FORM 2084 REV. 367

APPENDIX

ITEM NO.	CAPA- BILITY 0512LR	PART NUMBER	TITLE	MODEL NO.
29	051	1901426-011	NB/OPTICS HANDLING & INSTALL.FIXT.	H-23-193
30	051	1901846-031	G&N HARNESS SHIPPING FIXTURE	H-23-185
31	0512	1900009-031	TRANSPORTATION CART	H-23-122
32	0512L	1900299-021	DEGAUSSER ASSY.	A-23-103
33	1	1902431-021	PSA ADAPTER MODULE	A-23-201
34	5	1902431-031	PSA ADAPTER MODULE	H-23-201
35	51	SK-C734132	BREAKOUT BOX PSAAM BLK I	A-23-263
36	051	1015419	JUMPER BY PASS BLK I	A-23-102
37	2	1021616	JUMPER BY PASS BLK II	A-23-270
38	1	1902430-011	CONNECTOR COVERS BLK I/ISS	H-23-209
39	2	2900065-011	CONNECTOR COVERS BLK II	H-23-209
40	L	6900001-011	CONNECTOR COVERS LEM	H-23-209
41	2L	2900812	LIFTING BATTERY PK.ASSY.	NOT END ITEM
41	9	PART OF ITEM 19 LTC	GAEC LSC 410-31090	
42	0512	1022970	PROTECTIVE COVERS SXT/SCT	A-23-262 NOT END
42	9	ITEM PART OF ITEM 9		
43	12	2901075-011	BREAKOUT BOX & ADAPTER SET BASIC	A-23-300
44	12	2901074-011	ADAPTER CABLE SET,100/BLKII	A-23-301
45		2901076-011	ADAPTER CABLE SET,BLK II	A-23-302
46	L	6900077-011	ADAPTER CABLE SET,LEM	
47	1	1902545-011	ADAPTER CABLE SET,100	A-23-303
48	051	1902586-011	CDU INSTALLATION TOOL	H-23-253
49	2	2901143-011	PSA ADAPTER MODULE,BLK II	A-23-304
50	L	6900088-011	PSA ADAPTER MODULE,LEM	
50	9	MODEL NO. GAEC LSC 410-31080		
51	1	1899050	WRENCH,MOTORIZED AGC BLKI-100	H-23-254
52	1	1899051	WRENCH,TORQUE AGC BLK I-100	H-23-255
53	051	1014377-011	HANDLING FIXTURE,AGC MAIN DSKY	H-23-191
54	051	1014344-011	HANDLING FIXTURE,AGC NAV DSKY	H-23-192
55	2L	2014013-011	HANDLING FIXTURE,AGC UNIVERSAL	H-23-251
56	2L	2003310	RE-START MONITOR CHANNEL 77 ALARM BOX ASSY	

SIZE	CODE IDENT NO.		
A	80230	APOLLO G&N GSE 1900030	
SCALE-NONE	REV LTR	DP	SHEET 17

FORM 2084 REV. 367

(M) SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADDED ITEM 13	MXC 185927	2 MAY 63	RWT P.F.
A1		ADDED ITEM 14	MXC 185957		
A2		ADDED ITEM 15	MXC 186223		
A3		CHANGE IN ACCORDANCE WITH MXC-186528.	MXC-186528	20 MAY 63	JHH V.M.
A4		CHANGE IN ACCORDANCE WITH MXC-186711.	MXC-186711	24 MAY 63	JHH WD
B		PER TDRR 01703		26 June 1963	WK.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 DATE 24 Apr 63

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			REF		16	1900100	GSE OPTICS TEST MECHANIZATION
			1		15	1900010	IMU CONTAINER, SHIPPING & TRANSFER, REUSABLE.
			REF		14	1900066	AGE-GSE SIGNAL SELECTION MECHANIZATION DIAGRAM.
			REF		13	1900065	AGE-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.
			FT		12	1900019	FAMILY TREE
			GFP		11	1014156	AGC-TEST SET
					10		
					9		
					8		
			GFP		7	1014061	AGC SIMULATOR
			1		6	1900005	INERTIAL SUB-SYSTEM TEST EQUIP
			1		5	1900006	ROTARY TABLE
			GFP		4		OPTICS CHECKOUT KIT
					3		IMU TRANSPORTATION CART
					2		INVERTER & ALARM ASSEMBLY
			GFP		1		INERTIAL COMP TEMP CONTR.

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN W. Thiel DATE 1 APR 63
CHECKED 1 APR 63
APPROVAL 1 APR 63
APPROVAL 1 APR 63

NASA APPROVAL 4/24/63
J.P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO.
SIZE C
1900030
SCALE —
SHEET —

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900030A4

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADDED ITEM 13	MXC 185927	2 MAY 63	RWT P.F.
A1		ADDED ITEM 14	MXC 185957		
A2		ADDED ITEM 15	MXC 186223		
A3		CHANGE IN ACCORDANCE WITH MXC-186528.	MXC-186528	20 MAY 63	JHH Y.M.
A4		CHANGE IN ACCORDANCE WITH MXC-186711.	MXC-186711	24 MAY 63	JHH WD
B		PER TDRR 01703		26 June 1963	WK
B1		CHANGE IN ACCORDANCE WITH MXC-186809		5 JUL 63	JEL
B2		CHANGE IN ACCORDANCE WITH MXC-186862.		5 JUL 63	JEL
B3		CHANGE IN ACCORDANCE WITH MXC-186893		5 JUL 63	JEL
B4		CHANGE IN ACCORDANCE WITH MXC-186923		5 JUL 63	JEL
B5		CHANGE IN ACCORDANCE WITH MXC-187048		5 JUL 63	JEL
C		INCORPORATES B-1 THRU B-5 PER TDRR 02375		31 JULY 63	WAK

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 **DATE** 24 Apr 63

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			REF		20	1900144	GSE PWR CONT & DISTR MECHANIZATION
			REF		19	1900089	MECHANIZATION DIAG-GSE SYS & SUBSYSTEM MON-DISPLAY & CONTROLS
			REF		18	1900077	GSE COUNTER SIGNAL SELECT MECHANIZATION

QTY REQ'D — LIST OF PARTS AND MATERIALS

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1		17	1900155	TOOL-ALIGNMENT, IMU MOUNTING FIXTURE
			REF		16	1900100	GSE OPTICS TEST MECHANIZATION
			1		15	1900010	IMU CONTAINER, SHIPPING & TRANSFER, REUSABLE.
			REF		14	1900066	AGE-GSE SIGNAL SELECTION MECHANIZATION DIAGRAM.
			REF		13	1900065	AGE-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.
			FT		12	1900019	FAMILY TREE
			GFP		11	1014156	AGC-TEST SET
					10		
					9		
					8		
			GFP		7	1014061	AGC SIMULATOR
			1		6	1900005	INERTIAL SUB-SYSTEM TEST EQUIP
			1		5	1900006	ROTARY TABLE
			GFP		4		OPTICS CHECKOUT KIT
					3		IMU TRANSPORTATION CART
					2		INVERTER & ALARM ASSEMBLY
			GFP		1	1900011	INERTIAL COMP TEMP CONTROLLER

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiel DATE 1 APR 63
CHECKED Kourim 1 APR 63
APPROVAL H Brinkmann 1 APR 63
APPROVAL A. Kodel 1 APR 63
NASA APPROVAL 4/29/63
J. P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO. SIZE C 1900030
SCALE — SHEET —

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C2		CHANGE IN ACCORDANCE WITH MXC-187217		19 AUG 63	J.J.J.
D		CHANGE IN ACCORDANCE WITH MXC-187926		20 AUG 63	J.J.J.
E		CHANGE IN ACCORDANCE WITH MXC-187963		20 AUG 63	J.J.J.
F		REPLACED WITH CHANGE BY REV "G" PER MXC-188185		21 AUG 63	J.J.J.
		PER TDRR 04411		5 NOV 63	WK.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADDED ITEM 13	MXC 185927	2 MAY 63	RWT P.F.
A1		ADDED ITEM 14	MXC 185957		
A2		ADDED ITEM 15	MXC 186223		
A3		CHANGE IN ACCORDANCE WITH MXC-186528.	MXC-186528	20 MAY 63	JHH Y.M.
A4		CHANGE IN ACCORDANCE WITH MXC-186711.	MXC-186711	24 MAY 63	JHH
B		PER TDRR 01703		26 June 1963	WK.
B1		CHANGE IN ACCORDANCE WITH MXC-186809		5 JUL 63	JEL
B2		CHANGE IN ACCORDANCE WITH MXC-186862.		5 JUL 63	JEL
B3		CHANGE IN ACCORDANCE WITH MXC-186899		5 JUL 63	JEL
B4		CHANGE IN ACCORDANCE WITH MXC-186923		5 JUL 63	JEL
B5		CHANGE IN ACCORDANCE WITH MXC-187048		5 JUL 63	JEL
C		INCORPORATES B-1 THRU B-5 PER TDRR 02375		31 JULY 63	WK.
C1		CHANGE IN ACCORDANCE WITH MXC-187185		19 AUG 63	J.J.J.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 **DATE** 24 Apr 63

Ⓕ **REPLACED WITH CHANGE BY REV** G

QTY REQ'D	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		23	1900299-011	DEGAUSSER ASSEMBLY
	REF		22	1900258	TEST CONTROL MECHANIZATION
	REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM TEST INTERFACE MECHANIZATION
	REF		20	1900144	GSE PWR CONT & DISTR MECHANIZATION
	REF		19	1900089	MECHANIZATION DIAG-GSE SYS & SUBSYSTEM MON-DISPLAY&CONTROLS
	REF		18	1900077	GSE COUNTER SIGNAL SELECT MECHANIZATION

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1		17	1900155	TOOL-ALIGNMENT, IMU MOUNTING FIXTURE
			REF		16	1900100	GSE OPTICS TEST MECHANIZATION
			1		15	1900010	IMU CONTAINER, SHIPPING & TRANSFER, REUSABLE.
			REF		14	1900068	AGE-GSE SIGNAL SELECTION MECHANIZATION DIAGRAM.
			REF		13	1900065	AGE-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.
			FT		12	1900019	FAMILY TREE
			GFP		11	1014156	AGC - TEST SET
					10		
					9		
					8		
			GFP		7	1014061	AGC SIMULATOR
			1		6	1900005-011	INERTIAL SUB-SYSTEM TEST EQUIP
			1		5	1900006	ROTARY TABLE
			GFP		4		OPTICS CHECKOUT KIT
					3		IMU TRANSPORTATION CART
			GFP		2		INERTIAL COMP TEMP CONTROLLER
			1		1	1900011	INERTIAL COMP TEMP CONTROLLER

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
— — — — — —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Tikub DATE 1 APR 63
CHECKED 1 APR 63
APPROVAL 1 APR 63
APPROVAL 1 APR 63
NASA APPROVAL 4/24/63
J.P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO.
SIZE C
1900030
SCALE —
SHEET —

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

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DOCUMENTS							QUANTITY REQUIRED											END ITEM		
NOTES	MISC	CMRM	ND	FTM	MODEL NO.	PS	PC				171	161	151	141	131	121	111	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
							A							1	1	1		73	1901930 *	RETROFIT KIT (SERIES 50)
		1021034			H-23-185	DWG	A						✓	1	1		1	72	1901846-011	G & N HARNESS HANDL & SHIPPING FIXT.
					A-23-082		A							1		1		71	1901663-021	TUBING ASSY, PLASTIC
					A-23-082		A							1	1			70	1901663-011	TUBING ASSY, PLASTIC
					A-23-114		A										1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
					S-23-101	1901492-011	A										1	68	1901492-011	AUXILIARY BATTERY PACK
		1021034			H-23-193		A						✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT
		1021035		1900005	A-23-198		A							1	1	1		66	1901308-011 *	GSE TO G&N INTERCONNECT CABLES
		1021035		1900005	A-23-167	1900931	A							1	1	1		65	1900931-011 *	PSA TEST POINT ADAPTER
		1021034	1002065		A-23-080		A							1		1		64	1900926-011	ROTARY TABLE ASSY
		1021034			A-23-169		A							1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-169		A							1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F. F.
		1021034			A-23-168		A							2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-168		A							4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
		1021034			A-23-98	DWG	A						✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		1021035		1900005	A-23-100		A							1	1	1	1	58	1900805-011 *	PSA TRAY EXTENDER SET
		1021034			A-23-105	1900804	A						✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		1021034			A-23-094	1900803	A						✓	1	1	1	1	56	1900803-011	FILLING & PURGING FIXTURE
		1021034			A-23-104	1900802	A						✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		1021034			A-23-099	DWG	A						✓	1		1		54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		1021034			A-23-101	1900797	A						✓	1	1	1		53	1900797-011	LOAD & SIGNAL SIMULATOR SET
		1021035		1900005	A-23-108		A							1	1	1		52	1900740-011 *	GSE TO GSE INTERCONNECT CABLES
		1021034			A-23-090	DWG	A							1		1		51	1900606-011	PSA MTG FIXTURE
		1021034			A-23-107	1900491	A							1				50	1900491-011	REMOTE OPTICS CONTROLLER
	APT 1900433	1021035		1900005	A-23-102		A							1	1	1		49	1900433-011 *	GSE -J BOX OVERHEAD
		—			A-23-197	DWG	A								1			48	1900364-061	BLANK PANEL ASSY
		1021034			S-23-100	1900342	A						✓	1	1	1	1	47	1900342-011	INERTIAL COMP TEMP CONTROLLER
		1021034			A-23-103	1900299	A						✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
					A-23-106	1901933	A	PART OF 1901930										45	1901933-011	GSE PSA-J BOX
		1021035		1900005	C-23-411		A							1	1	1		44	1900145-011 *	G&N COOLANT & POWER CONSOLE
		1021034			A-23-093	DWG	A							1	1			43	1900014-011	G&N MTG FIXTURE
		1021034			A-23-092	DWG	A							1	1			42	1900013-011	OPTICS NAV BASE MTG FIXTURE
		1021034			A-23-091	DWG	A							1		1		41	1900012-011	IMU MTG FIXTURE
		1021034			H-23-123	1900010	A						✓					40	1900010-011	IMU SHIPPING CONTAINER
		1021034			H-23-122	DWG	A						✓	1	1	1		39	1900009-021	TRANSPORTATION CART G & N ASSY
		1021035		1900005	NA	1900005	A											38	1900005-021	OPTICS INERTIAL TEST SET
		1021035		1900005	C-23-404		A							1	1	1		37	1900004-021 *	OPTICS INERTIAL ANALYZER
		1021035		1900005	C-23-500		A							1	1	1		36	1900000-011 *	OSCILLOGRAPH CONSOLE
					TBA		R							1				35	1020393	INTERCONNECT KIT P & M
					C-23-403	—	R					1		1	1	1		34	1014217	COMP CALIB SYS CONSOLE
					C-23-501	—	R					1		1				33	1020342	AGC CTS OPEPATION CONSOLE
					C-23-402	—	R					1		1	1			32	1020341	AGC TEST SET
					TBA		R					1		1				31	1020339	MOUNTING KIT
					TBA		R					1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
					TBA		R					1		1				29	1020312	AGC GSE INTERCONNECT KIT, SUB-SYS
		—			A-23-081		R							1	1			28	1020343	MAIN DSKY MTG STAND
		—			H-23-190		R							1	1			27	1020001-3	AGC HANDLING FIXTURE
		1021066		1019840	A-23-200	1019840	K							1	1		1	26	1019840	RETRO REFLECTING PRISM
		1021066			A-23-196	1019837	K				1			1	1		1	25	1019837	PORTABLE LIGHT ASSY.
		1021066			C-23-593	1019769	K							1	1			24	1019769	SHAFT ACCURACY TESTER
		1021066			A-23-109	1019759	K							1	1			23	1019759	ADJ MIRROR & PEDESTAL ASSY.
		1021066			A-23-199	1019758	K						✓	1	1			22	1019758	TOOLING BAR ASSY
		1021066		1019721	H-23-197	1019721	K						✓					21	1019721	CASE ASSY STORAGE MAP & DATA VIEWER
		1021066		1019720	H-23-186	1019720	K						✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
		1021066			H-23-199	1019700	K						✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		1021066			A-23-079	1017447	K						✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY
		1021066		1017383	A-23-097	1017383	K										1	17	1017383	G&N INSTALL QUALIFICATION FIXTURE
		1021066		1017382	A-23-096	1017382	K										1	16	1017382	AZIMUTH REFERENCE FIXTURE
		1021066			A-23-111	1017381	K							1	1			15	1017381	45° AUTOCOLLIMATOR PLATE ASSY
		1021066			A-23-110	1017380	K							2	1			14	1017380	0° AUTOCOLLIMATOR PLATE ASSY
					A-23-077	1017376	K							1	1			13	1017376	WEDGE VARIABLE DEVIATION
				1016951	A-23-067	1016951	K							1	1			12	1016951	ALIGNMENT MIRROR ASSY
		1021068		1016949	C-23-502	1016949	K				1							11	1016949	FUNCTIONAL TESTER ASSY
		1021071		1016948	C-23-421	1016948	K				1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		1021070		1016910	A-23-095	1016910	K				1							9	1016910	PRECISION TEST FIXTURE
					H-23-198	SCD	M						✓	1	1	1		8	1015462	IMU LIFTING FIXTURE
					A-23-162	SCD	M										1	7	1015419	JUMPER BY-PASS ASSY. COOLANT FL.
					H-23-191	DWG	R					1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
					H-23-192	DWG	R					1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
					C-23-401	—	R							1		1		4	1014061	COMP SIMULATOR
					H-23-189	SCD	R						✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
					H-23-187	SCD	R						✓					2	1006230	AGC SHIPPING CONTAINER
					H-23-188	SCD	R						✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER

NOTES

1 -111 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2 -121 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3 -131 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4 -141 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (ISS/OSS/G&N/CSS).

5 -151 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT A G & N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6 -161 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7 -171 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK (*) ARE PART OF THE OPTICS INERTIAL TEST SET (P/N 1900005).

9 THIS DRAWING DENOTES THE "AS DESIGNED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR-17571			8-8-65	
AJ		REVISED PER TDRR 18580	FPG.		4/23/65	WK
AK		REVISED PER TDRR 18999	FPG		5-0-65	

MISCELLANEOUS DOCUMENTS

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
ND 1002205	TEST SPEC OSCILLOGRAPH GROUP	
ND 1002213	DESIGN CRITERIA SPEC OSCILLOGRAPH GROUP	
ND 1021037	G&N SYS EQUIPMENT FAMILIARIZATION MANUAL	
ND 1002194	INTERFACE SPEC FOR AGC CALIB SYS	
1900262	APOLLO-GSE INERTIAL SUB-SYS TEST INTERFACE MECH DIAG.	
1900258	TEST CONTROL MECH DIAG.	
1900144	GSE POWER CONT & DISTR. MECH. DIAG.	
1900100	GSE OPTICS TEST MECHANIZATION DIAG.	
1900089	GSE SYS & SUB-SYS MON-DISPLAY & CONT MECH DIAG	
1900077	GSE COUNTER SIGNAL SELECT MECH DIAG.	
1900066	AGC-GSE SIGNAL SELECT MECH DIAG.	
1900065	AGC-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.	
1020337	AGC-GSE INTERCONN. (S. S)	
1020335	AGC-GSE INTERCONN. (G & N)	REQUIRED FOR -131

(AG) THIS SHEET ADDED

BLOCK I
50 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. a. Jones 2-4-65
CHECKED
APPROVED
APPROVED C. Sperling 3/9/65
APPROVED MIT 3-9-65
APPROVED MSC A C Metz 3-9-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE
SHEET 2 OF 3

NOTICE – WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

NOTES	MISC	MANUAL	N D	F T M	MODEL NO.	P S	PC	271	261	251	241	231	221	211	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
								1									
		ND102 039			TBA		A			✓					81	TBA	CONNECTOR COVERS
		ND1021039			TBA		R			✓					80	1020423	CONNECTOR COVERS
		ND1021039			A-23-042		R							1	79	1020225	FIXTURE ASSY, ALIGNM. AGC NAV DSKY
		ND1021039			H-23-206		K			✓					78	TBA	OUA PURGE VALVE COVERS
		ND1021039			S-23-104		K			✓				1	77	1019984	OPTICS CLEANING KIT
		ND1021039			TBA		K			✓				1	76	TBA	CONNECTOR COVERS
		ND1021039			A-23-166		K			✓				1	75	TBA	OPTICS COVERS
		ND1021040			A-23-203	1019970	K			✓					74	1019970	STAR & HORIZ SIMULATOR CERT. FIXTURE
		ND1021040			A-23-202	10 9977	K				1	1			73	1019977	STAR & HORIZ SIMULATOR
		ND 021039			H-23-185	DWG	A			✓	1	1		1	72	1901846-021	G & N HARNESS HANDL. & SHIPPING FIXTURE
		ND1021040			A-23-082	DWG	A				1		1		71	1901663-021	TUBING ASSY, PLASTIC
		ND1021040			A-23-082	DWG	A				1	1			70	1901663-011	TUBING ASSY, PLASTIC
		ND102 039			A-23-114	DWG	A							1	69	1901520	CABLE, INTERCONNECT (NAA-P2 TO IMU)
		ND 021039			S-23-101	190/492	A							1	68	1901492-021	AUXILIARY BATTERY PACK
		ND1021039			H-23-193	DWG	A			✓	1	1		1	67	1901426-011	NAV BASE/OPT ASSY HAND & INST FIXT.
															66		
		ND1021040			A-23-167	1901981	A				1	1	1		65	1901981-011*	PSA TEST POINT ADAPTER
		ND1021040	1002065		A-23-080	ND	A				1		1		64	1900926-011	ROTARY TABLE ASSY
		ND1021040			A-23-169	DWG	A				1		1		63	1900867-021	HOSE COOLANT INTERCONNECT F.F.
		ND1021040			A-23-169	DWG	A				1	1			62	1900867-011	HOSE COOLANT INTERCONNECT F.F.
		ND1021040			A-23-168	DWG	A				2		2		61	1900866-021	HOSE COOLANT INTERCONNECT M-F
		ND1021040			A-23-168	DWG	A				4	4			60	1900866-011	HOSE COOLANT INTERCONNECT M-F
		ND1021040			A-23- 98	DWG	A			✓	1		1		59	1900810-011	ROTARY TABLE CALIB SET
		ND1021040			A-23-100	*	A				1	1	1	1	58	1900805-011*	PSA TRAY EXTENDER SET
		ND1021040			A-23-105	1900804	A			✓	1	1	1		57	1900804-011	IMU PRESSURE SEAL TESTER
		ND1021040			A-23-094	DWG	A			✓	1	1	1	1	56	1902371-011	FILLING & PURGING FIXTURE
		ND1021039			A-23-104	1900802	A			✓	1	1	1	1	55	1900802	IMU SNAP-ON BELLOWS
		ND1021040			A-23-099	DWG	A			✓	1				54	1900800-011	IMU MTG ALIGN CALIB TOOL SET
		ND1021040			A-23-101	1900797-021	A			✓	1	1	1		53	1900797-021	LOAD & SIGNAL SIMULATOR SET
		ND1021040			A-23-108	DWG	A				1	1	1		52	1902299-011*	CABLE SET, INTERCONN.
		ND1021040			A-23-090	DWG	A				1		1		51	1900606-021	PSA MTG FIXTURE
		ND1021040			A-23-107	1902046	A				1				50	1902046-011	REMOTE OPTICS CONTROLLER
		ND1021040			A-23-102	1901959	A				1	1	1		49	1901959-011*	GSE-J BOX OVERHEAD
		ND1021040			A-23-197	DWG.	A					1			48	1900364-061	BLANK PANEL ASSY
		ND102 039			S-23-100	1900342	A			✓	1	1	1	1	47	1900342-011	INERTIAL COMP. TEMP. CONTROLLER
		ND1021039			A-23-103	1900299	A			✓	1	1	1	1	46	1900299-011	DEGAUSSER ASSY
		ND1021040			A-23-106	1900268-031	A				1		1		45	1902195-011	GSE/PSA-J BOX
		ND1021040			C-23-411	*	A				1	1	1		44	1902134-011*	G&N COOLANT & POWER CONSOLE
		ND1021040			A-23-093	DWG	A				1	1			43	1902204-011	G&N MTG FIXTURE
		ND1021040			A-23-092	DWG	A				1	1			42	1902301-011	OPTICS NAV BASE MTG FIXTURE
		ND1021040			A-23-091	DWG	A				1		1		41	1900012-011	IMU MTG FIXTURE
		ND1021039			H-23-123	1900010	A			✓					40	1900010-011	IMU SHIPPING CONTAINER
		ND1021039			H-23-122	DWG	A			✓	1	1	1		39	1900009-021	TRANSPORTATION CART, G&N, ASSY
		ND1021040		190005-031	NA	1900005-031	A								38	1902300-011	OPTICS INERTIAL TEST SET
		ND1021040			C-23-404	*	A				1	1	1		37	1901976-011*	OPTICS INERTIAL ANALYZER
		ND1021040			C-23-500	*	A				1	1	1		36	1900000-011*	OSCILLOGRAPH CONSOLE
		ND1021040			TBA	DWG	R				1				35	1020393	INTERCONNECT KIT, P&M
		ND1021040		1020344	C-23-403	1014217	R		1		1	1	1		34	1020344	COMP CALIB SYS CONSOLE
		ND1021040		1020342	C-23-501	1014465	R		1		1				33	1020342	AGC CTS OPERATION CONSOLE
		ND1021040		1020341	C-23-402	1020341	R		1		1	1			32	1020341	AGC TEST SET
					A-23-205	DWG	R				1				31	1020338	MOUNTING KIT
		ND1021040			C-23-424	DWG	R		1		1	1			30	1020313	AGC GSE INTERCONNECT KIT G & N
		ND1021040			C-23-423	DWG	R		1		1				29	1020312	AGC GSE INTERCONNECT KIT SUB-SYS
		ND1021040			A-23-081	DWG	R				1	1			28	1020343	MAIN DSKY MTG STAND
					H-23-190	DWG	R				1	1			27	1020001	AGC HANDLING FIXTURE
		ND1021039			A-23-200	1019840	K				1	1		1	26	1019840	RETRO REFLECTING PRISM
		ND1021039			A-23-196	1019837	K	1			1	1		1	25	1019837	PORTABLE LIGHT ASSY
		ND1021040			C-23-593	1019769	K				1	1			24	1019769	SHAFT ACCURACY TESTER
		ND1021040			A-23-109	1019759	K				1	1			23	1019759	ADJ. MIRROR & PEDESTAL ASSY
		ND1021040			A-23-199	1019758	K			✓	1	1			22	1019758	TOOLING BAR ASSY
		ND1021039			H-23-197	1019721	K			✓					21	1019721	CASE ASSY, STORAGE, MAP & DATA VIEWER
		ND1021039			H-23-186	1019720	K			✓					20	1019720	OPTICS-NAV BASE, SHIPPING CONTAINER
		ND1021039			H-23-199	1019700	K			✓					19	1019700	SHIPPING & STORAGE CONTAINER, OPT UNIT
		ND1021040			A-23-079	1017447	K			✓	1	1		1	18	1017447	THEODOLITE & SUPPORT ASSY.
		ND1021039			A-23-097	1017383	K							1	17	1017383	G&N INSTALL. QUALIFICATION FIXTURE
		ND1021039			A-23-096	1017382	K							1	16	1017382	AZIMUTH REFERENCE FIXTURE
		ND1021040			A-23-111	1017381	K				1	1			15	1017381	45° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-110	1017380	K				2	1			14	1017380	0° AUTO COLLIMATOR PLATE ASSY
		ND1021040			A-23-077	1017376	K				1	1			13	1017376	WEDGE, VARIABLE DEVIATION
		ND1021040			A-23-067	1016951	K				1	1			12	1016351	ALIGNMENT MIRROR ASSY.
		ND1021040			C-23-502	1016949	K	1							11	1016949	FUNCTIONAL TESTER ASSY.
		ND1021040			C-23-421	1016948	K	1							10	1016948	TESTER ASSY, MAP & DATA VIEWER
		ND1021040			A-23-095	1016910	K	1							9	1016910	PRECISION TEST FIXTURE
		ND1021040			H-23-198	DWG	M				1	1	1		8	1015462	IMU LIFTING FIXTURE
		ND1021039			A-23-162	DWG	M							1	7	1015419	JUMPER BY-PASS ASSY, COOLANT FL.
		ND1021039			H-23-191	DWG	R		1		1				6	1014377	AGC MAIN DSKY HANDLING FIXTURE
		ND1021039			H-23-132	DWG	R		1		1				5	1014334	AGC NAV DSKY HANDLING FIXTURE
SEE NOTE 11		ND1021040		014061	C-23-401	1014061	R				1		1		4	1014061-000	COMP. SIMULATOR
		ND1021039			H-23-189	SCD	R			✓					3	1006231	AGC NAV DSKY SHIPPING CONTAINER
		ND1021039			H-23-187	SCD	R			✓					2	1006230	AGC SHIPPING CONTAINER
		ND1021039			H-23-188	SCD	R			✓					1	1006229	AGC MAIN DSKY SHIPPING CONTAINER
	DOCUMENTS						QUANTITY REQUIRED								END ITEM		

NOTES:

1-211 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPORT POST INSTALLATION TESTING.

2-221 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB-SYSTEM (ISS) TESTING.

3-231 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIPMENT (G & N) TESTING.

4-241 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS. (ISS/OSS/G&N/CSS).

5-251 CONFIGURATION: EQUIPMENT REQUIRED TO SUPPOPT A G&N SYSTEM, A GSE COMPLEMENT OR THEIR COMPONENTS.

6-261 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT SOLELY COMPUTER SUB-SYSTEM (CSS) TESTING.

7-271 CONFIGURATION: EQUIPMENT REQUIRED TO CONDUCT R & I OF OPTICS EQUIPMENT.

8 LINE ITEMS MARKED WITH AN ASTERISK(*) ARE PART OF THE OPTICS INERTIAL TEST SET.

9 THIS DRAWING DENOTES THE "AS REQUIRED" CONFIGURATION OF ALL GSE END ITEMS.

10 THE QUANTITIES SPECIFIED IN THIS CONFIGURATION DRAWING DO NOT IMPLY HARDWARE ALLOCATION.

11. P/N 1014061-011 CAN BE USED IN LIEU OF P/N 1014061-(000)

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
AG		THIS SHEET ADDED. TDRR 17228	RJ			
AH		REVISED PER TDRR 17571			3-4-65	
AJ		REVISED PER TDRR 18580	F.P.G.			
AK		REVISED PER TDRR 18999	F.P.G.		5-10-65	

DOCUMENT NO.	DOCUMENT DESCRIPTION	NOTES
ND1021038	PACKING, SHIPPING & HANDLING MANUAL	
ND1021041	G&N SYSTEM MANUAL	
1019890	DIAG, MECH FUNCTIONAL TESTER	
1019883	DIAG, MECH STAR & HORIZ SIMULATOR CAL EQUIP.	
1019900	DIAG, MECH STAR & HORIZON SIMULATOR	
1019899	DIAG, MECH G&N FIXTURE STAND	
ND 1021037	G & N SYS EQUIPMENT FAMILIARIZATION MANUAL	
E-1432	APOLLO GSE FAMILIARIZATION MANUAL	
1902169	DIAG. MECH. PIP & IRIG MONITORING	
1902168	DIAG. MECH. APOLLO GSE GROUNDING	
1902167	DIAG. MECH. COAX. SIGNAL DIST, TEST POINT ADAPTER	
1902166	DIAG. MECH. MEASUREMENT REF. POWER SUPPLIES	
1902165	DIAG. MECH. COUNTER, SIGNAL SELECTION	
1902164	DIAG. MECH. OSCILLOGRAPH SIGNAL SELECTION	
1902163	DIAG. MECH. SIGNAL SELECTION & MEASUREMENT	
1902160	DIAG. MECH. TEST SELECTOR PANEL	
1902156	DIAG. MECH. TEST CONTROL PANEL	
1902155	DIAG. MECH. COMPUTER SIMULATOR	
1902154	DIAG. MECH. MONITOR PANEL	
1902153	DIAG. MECH. GIMBAL POSITION CONTROL	
1902152	DIAG. MECH. POWER & DUMMY LOAD PANEL GYRO CAGING	
1902151	DIAG. MECH. TEMP. MONIT. & CONTROL PANEL	
1902150	DIAG. MECH. A.C. POWER PROTECT. PANEL & POWER DIST	

MISCELLANEOUS DOCUMENTS

(AG) THIS SHEET ADDED

BLOCK I

100 SERIES

MASTER

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
	1000000

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN E. A. Jones 2/25/65
CHECKED
APPROVED
APPROVED 3/4/65
APPROVED MIT 3-4-65
APPROVED MSC 3-4-65
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO G & N
GROUND SUPPORT EQUIPMENT

CODE IDENT NO. 80230
SIZE D
DRAWING NO. 1900030
SCALE
SHEET 3 OF 3

N 1900030

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
G		REPLACES REVISION F WITH CHANGE PER MXC-188185		22 AUG 63	J.J.J. WL
H		CHANGE IN ACCORDANCE WITH MXC 188534		23 AUG 63	J.J.J. WL
J		CHANGE IN ACCORDANCE WITH MXC 188670		23 AUG 63	J.J.J. WL
K		CHANGE IN ACCORDANCE WITH MXC-188907		23 AUG 63	J.J.J. WL
L		CHANGE IN ACCORDANCE WITH MXC-189047		23 AUG 63	J.J.J. WL
M		CHANGE IN ACCORDANCE WITH MXC-189121		23 AUG 63	J.J.J. WL
N		CHANGE IN ACCORDANCE WITH MXC 190238		7 OCT 63	J.J.J. EF
		REVISED PER TDR 04411		5 NOV 63	UK

NOTES:

1. 011 CONFIGURATION - COMPLETE SET OF GSE
2. 021 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIP (AGE) TESTING.
4. 041 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (IGS/OSS/AGE).
5. 051 CONFIGURATION - FACILITY ASSIGNED EQUIPMENT NOT ASSOCIATED WITH SPECIFIC TESTS. QUANTITIES REQUIRED VARY WITH FACILITY & MUST BE SPECIFIED INDEPENDENTLY FOR EACH COMPONENT IN THIS SET.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 DATE 24 Apr 63

Ⓖ REPLACES REV F WITH CHANGE

QUANTITY REQUIRED					EFFECTIVITY	LIST OF PARTS AND MATERIALS		
051	041	031	021	011		ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
AR				1		42	1900800-011	ALIGNMENT SET, IMU FIXTURE
AR				1		41	1900810-011	ROTARY TABLE CALIBRATION SET
AR				1		40	1900811-011	G&N HARNESS SHIPPING FIXTURE
GFP				GFP		39	1020016	AGC SHIPPING CONTAINER
GFP				GFP		38	1017384	NAV BASE/OPTICS SHIPPING CONTAINER
AR				1		37	1900797-011	SIMULATOR SET, LOAD & SIGNAL
AR				1		36	1900804-011	IMU PRESSURE SEAL TESTER
AR				1		35	1900803-011	FILLING & PURGING FIXTURE
AR				1		34	1900802	BELLOWS, IMU SNAP-ON
GFP				GFP		33	1014217	AGC CALIBRATION SYSTEM
AR				1		32	1900342-011	INERTIAL COMP. TEMP CONTROLLER
AR				1		31	1900009-011	G&N TRANSPORTATION CART
	1			1		30	1900491	REMOTE OPTICS CONTROLLER
						29		
	1		1	1		28	1900606	PSA MOUNTING FIXTURE
	1		1	1		27	1900268-011	GSE-PSA JUNCTION BOX ASS'Y
	1			1		26	1900013-011	OPTICS/NB MOUNTING FIXTURE ASSEMBLY
	1	1		1		25	1900014-011	G&N MOUNTING FIXTURE
	1		1	1		24	1900012-011	IMU MOUNTING FIXTURE ASSEMBLY
AR				1		23	1900299-011	DEGAUSSER ASSEMBLY
				REF		22	1900258	TEST CONTROL MECHANIZATION
				REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM TEST INTERFACE MECHANIZATION
				REF		20	1900144	GSE PWR CONT & DISTR MECHANIZATION
				REF		19	1900089	MECHANIZATION DIAG-GSE SYS & SUBSYSTEM MON-DISPLAY & CONTROLS
				REF		18	1900077	GSE COUNTER SIGNAL SELECT MECHANIZATION
						17		
				REF		16	1900100	GSE OPTICS TEST MECHANIZATION
AR				1		15	1900010-011	IMU SHIPPING CONTAINER
				REF		14	1900066	AGE-GSE SIGNAL SELECTION MECHANIZATION DIAGRAM
				REF		13	1900065	AGE-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.
FT	FT	FT	FT	FT		12	1900019	FAMILY TREE
	GFP	GFP		GFP		11	1020002	AGC-TEST SET
						10		
						9		
						8		
	GFP		GFP	GFP		7	1014061	COMPUTER SIMULATOR
	1	1	1	1		6	1900005-011	OPTICS INERTIAL TEST SET
	1		1	1		5	1900006	ROTARY TABLE
				GFP		4		OPTICS CHECKOUT KIT
						3		
						2		
						1		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 1 APR 63
CHECKED MALIKOWSKI 1 APR 63
APPROVAL H. BRINKMAN 1 APR 63
APPROVAL 11/4/63
NASA APPROVAL
MIT APPROVAL 5 Nov 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO.
SIZE D
1900030
SCALE —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

W 1900030

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
	W	REPLACED WITH CHANGE BY REV. Y PER CM195220		24 APR 64	M.B. P.F.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		REPLACES REVISION F WITH CHANGE PER MXC-188185		22 AUG 63	J.J.J. WA
H		CHANGE IN ACCORDANCE WITH MXC 188534		23 AUG 63	J.J.J. WA
J		CHANGE IN ACCORDANCE WITH MXC 188670		23 AUG 63	J.J.J. WA
K		CHANGE IN ACCORDANCE WITH MXC-188907		23 AUG 63	J.J.J. WA
L		CHANGE IN ACCORDANCE WITH MXC-189047		23 AUG 63	J.J.J. WA
M		CHANGE IN ACCORDANCE WITH MXC-189121		23 AUG 63	J.J.J. WA
N		CHANGE IN ACCORDANCE WITH MXC 190238		7 OCT 63	J.J.J. EF
		REVISED PER TDR 04411		5 NOV 63	WR
P		CHANGE IN ACCORDANCE WITH MXC [illegible] PER TDRR 09267		8 JAN 63	L.G.H. EF
R		CHANGE IN ACCORDANCE WITH MXC [illegible] PER TDRR 09267		9 JAN 64	L.G.H. EF
S		CHANGE IN ACCORDANCE WITH MXC [illegible] PER TDRR 09267		9 JAN 64	L.G.H. EF
T		CHANGE IN ACCORDANCE WITH MXC 193680 PER TDRR 09267		10 JAN 64	L.G.H. EF
U		CHANGE IN ACCORDANCE WITH CM 194260		23 JAN 64	J.J.J.
		REVISED PER TDR 09268			
V		CHANGE IN ACCORDANCE WITH CM 194772 09268		20 APR 64	J EF

NOTES:
1. 011 CONFIGURATION - COMPLETE SET OF GSE
2. 021 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIP (AGE) TESTING.
4. 041 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (IGS/OSS/AGE).
5. 051 CONFIGURATION - FACILITY ASSIGNED EQUIPMENT NOT ASSOCIATED WITH SPECIFIC TESTS. QUANTITIES REQUIRED VARY WITH FACILITY & MUST BE SPECIFIED INDEPENDENTLY FOR EACH COMPONENT IN THIS SET.

Ⓦ REPLACED WITH CHANGE BY REV Y

Ⓖ REPLACES REV F WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 24 Apr 64 **DATE**

QUANTITY REQUIRED					EFFECTIVITY	LIST OF PARTS AND MATERIALS		
051	041	031	021	011		ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						52		
AR				1		51	1901426-011	OPTICS/NAV. BASE HANDLING FIXTURE
AR				1		50	1901415-011	SWITCHING UNIT, TRANSFER
AR				1		49	1901492-011	AUXILIARY BATTERY PACK
		1				48	1900364-061	BLANK PANEL ASSY
	RAY	RAY		RAY		47	1014465	AGC/CTS OPERATION CONSOLE
	7	7	2	7		46	1900866-011	HOSE, COOLANT, INTERCONNECT M-F
	3		3	3		45	1900866-021	HOSE, COOLANT, INTERCONNECT M-F
	1	1		1		44	1900867-011	HOSE, COOLANT, INTERCONNECT F-F
	1		1	1		43	1900867-021	HOSE, COOLANT, INTERCONNECT F-F
AR				1		42	1900800-011	IMU MTG. FIXTURE ALIGNMENT SET
AR				1		41	1900810-011	ROTARY TABLE CALIBRATION KIT
AR				1		40	1900811-011	G&N HARNESS SHIPPING FIXTURE
AR				1		37	1900797-011	SIMULATOR SET, LOAD & SIGNAL
AR				1		36	1900804-011	IMU PRESSURE SEAL TESTER
AR				1		35	1900803-011	FILLING & PURGING FIXTURE
AR				1		34	1900802	BELLOWS, IMU SNAP-ON
RAY				RAY		33	1014217	AGC CALIBRATION CONSOLE
AR				1		32	1900342-011	INERTIAL COMP. TEMP CONTROLLER ASSY.
AR				1		31	1900009-011	G & N TRANSPORT CART
	1			1		30	1900491-011	REMOTE OPTICS CONTROLLER
						29		
	1		1	1		28	1900606-011	PSA MOUNTING FIXTURE
	1		1	1		27	1900268-011	GSE-PSA JUNCTION BOX ASS'Y
	1			1		26	1900013-011	OPTICS/NB MOUNTING FIXTURE ASSEMBLY
	1	1		1		25	1900014-011	G&N MOUNTING FIXTURE
	1		1	1		24	1900012-011	IMU MOUNTING FIXTURE
AR				1		23	1900299-011	DEGAUSSER ASSEMBLY
				REF		22	1900258	TEST CONTROL MECHANIZATION

QUANTITY REQUIRED					EFFECTIVITY	LIST OF PARTS AND MATERIALS		
051	041	031	021	011		ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM TEST INTERFACE MECHANIZATION
				REF		20	1900144	GSE PWR CONT & DISTR MECHANIZATION
				REF		19	1900089	MECHANIZATION DIAG-GSE SYS & SUBSYSTEM MON-DISPLAY & CONTROLS
				REF		18	1900077	GSE COUNTER SIGNAL SELECT MECHANIZATION
						17		
				REF		16	1900100	GSE OPTICS TEST MECHANIZATION
AR				1		15	1900010-011	IMU SHIPPING CONTAINER
				REF		14	1900066	AGE-GSE SIGNAL SELECTION MECHANIZATION DIAGRAM
				REF		13	1900065	AGE-GSE GROUNDING & ISOLATION INTERFACE MECH. DIAG.
FT	FT	FT	FT	FT		12	1900019	FAMILY TREE
	RAY	RAY		RAY		11	1014156	AGC-TEST SET ASSY
						10		
						9		
						8		
	RAY		RAY	RAY		7	1014061	DRAWER ASSY COMPUTER SIMULATOR
	1	1	1	1		6	1900005-011	OPTICS INERTIAL TEST SET
	1		1	1		5	1900926-011	ROTARY TABLE
				KIC		4	1017400	OPTICS TEST EQUIPTMENT
						3		
						2		
						1		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 1 APR 63
CHECKED MALIKOWSKI 1 APR 63
APPROVAL H. BRINKMAN 1 APR 63
APPROVAL L. Gelman 11/4/63
NASA APPROVAL
MIT APPROVAL 5 Nov 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO.
SIZE D
1900030
SCALE —
SHEET 1 OF 1

Z 1900030

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Y		REPLACES REV. W WITH CHANGE PER CM195220. ADDED CUSTOMER DATA (V2-64) REVISED PER TDR		25 APR 64	MB
Z		CHANGE IN ACCORDANCE WITH CM-195280 TDRR 09268	—	11 MAY 64	WK 27 May WK

NOTES:

1. 011 CONFIGURATION - COMPLETE SET OF GSE
2. 021 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY INERTIAL SUB SYSTEM (ISS) TESTING.
3. 031 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT SOLELY APOLLO GUIDANCE EQUIP (AGE) TESTING.
4. 041 CONFIGURATION - EQUIPMENT REQUIRED TO CONDUCT ALL APOLLO TESTS (IGS/OSS/AGE).
5. 051 CONFIGURATION - FACILITY ASSIGNED EQUIPMENT NOT ASSOCIATED WITH SPECIFIC TESTS. QUANTITIES REQUIRED VARY WITH FACILITY & MUST BE SPECIFIED INDEPENDENTLY FOR EACH COMPONENT IN THIS SET.
6. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

Ⓨ REPLACES REV. W WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 DATE 24 Apr 63

SEE NOTE 6

051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1			1		53	1901364-011	COUPLING ASSY
AR				1		52	1901520	CABLE INTERCONNECT (NAA-P2 TO IMU)
AR				1		51	1901426-011	OPTICS/NAV. BASE HANDLING FIXTURE
AR				1		50	1901415-011	SWITCHING UNIT, TRANSFER
AR				1		49	1901492-011	AUXILIARY BATTERY PACK
		1				48	1900364-061	BLANK PANEL ASSY
	RAY	RAY		RAY		47	1014465	AGC/CTS OPERATION CONSOLE
	7	7	2	7		46	1900866-011	HOSE, COOLANT, INTERCONNECT M-F
	3		3	3		45	1900866-021	HOSE, COOLANT, INTERCONNECT M-F
	1	1		1		44	1900867-011	HOSE, COOLANT, INTERCONNECT F-F
	1		1	1		43	1900867-021	HOSE, COOLANT INTERCONNECT F-F
AR				1		42	1900800-011	IMU MTG. FIXTURE ALIGNMENT SET
AR				1		41	1900810-011	ROTARY TABLE CALIBRATION KIT
AR				1		40	1900811-011	G&N HARNESS SHIPPING FIXTURE
AR				1		37	1900797-011	SIMULATOR SET, LOAD & SIGNAL
AR				1		36	1900804-011	IMU PRESSURE SEAL TESTER
AR				1		35	1900803-011	FILLING & PURGING FIXTURE
AR				1		34	1900802	BELLOWS, IMU SNAP-ON
RAY				RAY		33	1014217	AGC CALIBRATION CONSOLE
AR				1		32	1900342-011	INERTIAL COMP TEMP CONTROLLER ASSY.
AR				1		31	1900009-011	G&N TRANSPORT
								CART
	1			1		30	1900491-011	REMOTE OPTICS CONTROLLER
						29		
	1		1	1		28	1900606-011	PSA MOUNTING FIXTURE
	1		1	1		27	1900268-011	GSE-PSA JUNCTION BOX ASS'Y
	1			1		26	1900013-011	OPTICS/NB MOUNTING FIXTURE
								ASSEMBLY
	1	1		1		25	1900014-011	G&N MOUNTING FIXTURE
	1		1	1		24	1900012-011	IMU MOUNTING FIXTURE
AR				1		23	1900299-011	DEGAUSSER ASSEMBLY
				REF		22	1900258	TEST CONTROL MECHANIZATION

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

051	041	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				REF		21	1900262	APOLLO-GSE INERTIAL SUB-SYSTEM
								TEST INTERFACE MECHANIZATION
				REF		20	1900144	GSE PWR CONT & DISTR
								MECHANIZATION
				REF		19	1900089	MECHANIZATION DIAG-GSE SYS &
								SUBSYSTEM MON-DISPLAY & CONTROLS
				REF		18	1900077	GSE COUNTER SIGNAL SELECT
								MECHANIZATION
						17		
				REF		16	1900100	GSE OPTICS TEST MECHANIZATION
AR				1		15	1900010-011	IMU SHIPPING CONTAINER
				REF		14	1900066	AGE-GSE SIGNAL SELECTION
								MECHANIZATION DIAGRAM
				REF		13	1900065	AGE-GSE GROUNDING & ISOLATION
								INTERFACE MECH. DIAG.
FT	FT	FT	FT	FT		12	1900019	FAMILY TREE
	RAY	RAY		RAY		11	1014156	AGC-TEST SET ASSY
						10		
						9		
						8		
	RAY		RAY	RAY		7	1014061	DRAWER ASSY COMPUTER SIMULATOR
	1	1	1	1		6	1900005-011	OPTICS INERTIAL TEST SET
	1		1	1		5	1900926-011	ROTARY TABLE
				KIC		4	1017400	OPTICS TEST EQUIPMENT
						3		
						2		
						1		

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — —
DECIMALS + — — —
ANGLES + — — —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-437

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 1 APR 63
MALIKOWSKI 1 APR 63
CHECKED
APPROVAL H. BRINKMAN 1 APR 63
APPROVAL
NASA APPROVAL 5-27-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

APOLLO
GROUND SUPPORT
EQUIPMENT

CODE IDENT NO. SIZE D 1900030
SCALE — SHEET 1 OF 1

MIL 10780-P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00995 DATE 24 Apr 63

			FT		12	1900019	FAMILY TREE
			GFP		11	1014156	AGC-TEST SET
					10		OPTICS-IMU-NAV BASE FIXTURE
					9		OPTICS, NAV BASE FIXTURE
					8		IMU FIXTURE
					7		THERMAL MOUNTING UNIT
			1		6	1900004	OPTICS·INERTIAL ANALYZER
			1		5	1900006	ROTARY TABLE
					4		OPTICS CHECKOUT KIT
					3		IMU TRANSPORTATION CART
					2		IMU SHIPPING CONTAINER
					1		INERTIAL COMP TEMP CONTR.
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

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DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ –	+ –	+ –
– –	– –	– –

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN W. Thib DATE 1 APR 63
1 APR 63
CHECKED
APPROVAL 1 APR 63
APPROVAL 1 APR 63

NASA APPROVAL 4/24/63
J. P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GROUND SUPPORT EQUIPMENT

CODE IDENT NO.
SIZE C
1900030
SCALE –
SHEET –

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'
3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.
4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.
5. $\boxed{C}$ REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PLATES SUPPLIED WITH ITEM 1 BY VENDOR IN ADDITION TO ITEM (73)
6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)
7. CONNECTOR INSTALLATION:
   INSTALL J1 THRU J4 INCLUSIVE OF ②
   INTO ㉒ AS SHOWN.
   INSTALL J16 THRU J26 INCLUSIVE OF ②
   INTO ㊾ AS SHOWN.
   INSTALL J5 THRU J15 INCLUSIVE OF ②
   INTO (74) AS SHOWN.
~~8. CAUTION: ② CANNOT BE ASSEMBLED TO ① WITH PANEL MOUNTING J5 THRU J15 INCLUSIVE, ATTACHED.~~
9. AFTER ASSEMBLY OF ② TO ①, ATTACH RETRACTOR MOUNTED CABLES, OF ②, TO ⑫ IN THEIR RESPECTIVE AREAS.
10. ELECTRICAL REQUIREMENTS:
   AFTER INSTALLATION OF ② & ⑩ PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
   A. *POWER ISOLATION CHECK*
   WITH 500 VOLTS DC APPLIED READ A MINIMUM OF 100 MEGOHMS FROM THE FOLLOW POINTS P89-A,B,C,E & K N,O,P,R,S,T,U, P45-R, P43-S, & E1 AND BETWEEN EACH OF THESE POINTS.
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
12. MARK CHARACTERS .38 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK ~~(25 PLACES)~~
13. *ADJUST ITEM ㉖ SO AS TO SUPPORT UNDER SIDE OF ITEMS ㉘ & (62).*
14. DISPOSE OF EXCESS DRAWER MOUNTING AND RETRACTOR HARDWARE IN AN APPROVED MANNER.

NOTES (CONTINUED)

15. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267) AND SERIALIZE PER ND1002023.
15. VENDOR ITEM, SEE SOURCE CONTROL DRAWING.

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A	SHT 3
B-B	SHT 4
C-C	SHT 5
D-D	SHT 2
E-E	SHT 6
F-F	SHT 6
G-G	SHT 6
H-H	SHT 6
J-J	SHT 7
K-K	SHT 7
L-L	SHT 7
M-M	SHT 7
N-N	SHT 5
P-P	SHT 5
R-R	SHT 3
S-S	SHT 3
T-T	SHT 4
U-U	SHT 4
V-V	SHT 4
W-W	SHT 6
X-X	SHT 4
Y-Y	SHT 6
Z-Z	SHT 2

DETAILS:

A	SHT 4
B	SHT 3
C	SHT 5
D	SHT 7

PARTIAL VIEWS:

Q-Q	SHT 2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		REPLACES REVISION "C" WITH CHANGE PER MXC 188871	TDRR 02580	30 JUL 63	C.A.M. / EF
				14 AUG 60	WK.
E		CHANGE IN ACCORDANCE WITH MXC 189072		3 SEP 63	AU
-	-	ADDED CUSTOMERS DATA (Y 6-63)	—	4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G	-	CHANGE IN ACCORDANCE WITH MXC 189686	—	9 SEP 63	V.J.J. / AU
H	-	CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
J	—	CHANGE IN ACCORDANCE WITH MXC 191867	—	6 NOV 63	WSM
K		CHANGE IN ACCORDANCE WITH CM 192872		10 JAN 64	E.M. / R.D.
L		REVISION STATUS CHANGED PER CM 192872		10 JAN 64	E.M. / R.D.
M		REVISION STATUS CHANGED PER CM 193187		13 JAN 64	E.M.
N		ITEM 15 WAS 1015918-109 PER CM 193580		14 JAN 64	E.M.
P	—	CHANGE IN ACCORDANCE WITH CM-193681		24-JAN-64	J.B.
R	—	CHANGE IN ACCORDANCE WITH CM-193683		28-JAN-64	J.B.
S	—	CHANGE IN ACCORDANCE WITH CM-194362		28-JAN-64	J.B.
T	-	CHANGE IN ACCORDANCE WITH CM-194739 REVISE PER TDRR 07470		3 FEB 64 4-7-64	
U		CHANGE IN ACCORDANCE WITH CM 195566 ADDED CUSTOMER DATA (Y2-64) TDRR 10721		22 APR 64	J.C. / CP
V		CHANGE IN ACCORDANCE WITH CM 195662 TDRR 10722		11 MAY 64	
W	E-3	CHANGE IN ACCORDANCE WITH CM 195957 TDRR 10723		28 MAY 64	BK / CP
Y	A-8	CHANGE IN ACCORDANCE WITH CM 196077 TDRR 10724		2 JUN 64	EF
Z		CHANGE IN ACCORDANCE WITH CM 196261 TDRR 10725		10 JUN 64	RB.
AA		CHANGE IN ACCORDANCE WITH CM 196320		16 JUN 64	BK
AB		CHANGE IN ACCORDANCE WITH CM 196322 10726		18 JUN 64	JJJ / EF

AB	Y	T	U	R	Z	P	L
AA	Y	T	U	R	Z	P	L
Z	Y	T	U	R	Z	P	L
Y	Y	T	U	R	L	P	L
W	W	T	U	R	L	P	L
V	R	T	U	R	L	P	L
U	R	T	U	R	L	P	L
S	R	L	S	R	L	P	L
R	R	L	P	R	L	P	L
P	M	L	P	H	L	P	L
N	M	L	L	H	L	L	L
M	M	L	L	H	L	L	L
L	L	L	L	H	L	L	L
K	H	D	H	H	K	K	K
J	H	D	H	H	D	E	E
H	H	D	H	H	D	E	E
G	G	D	E	E	D	E	E
F	F	D	E	E	D	E	E
E	E	D	E	E	D	E	E
D	D	D	D	D	D	D	D
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 DATE 14 Aug 63

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		77	1015790-002	NUT BAR
NOTE 11				2		76	1015800-001	CABLE RETRACTOR
				5		75	1900369	GASKET - CONNECTOR
				1		74	1900365	PANEL ASS'Y (INSEP)
NOTE 5, 15				17		73	1901346	PLATE, CLOSURE
NOTE 11				21		72	1006783-29	SCREW-BUTTON-HEX. SOC.
				43		71	AN363C832 (1896990-281)	NUT, SELF LOCKING
				12		70	MS-35234-60	SCREW, PAN HEAD
				2		69	1900973	DEFLECTOR, AIR
				37		68	AN960C8L (1897006-038)	WASHER, FLAT
NOTE 11				37		67	1006783-27	SCREW-BUTTON-HEX SOC
				36		66	MS35338-80	WASHER-LOCK
				1		65	1900368-009	GASKET-CONNECTOR
				1		64	1900569	STORAGE DRAWER ASSY
				1		63	1900568	STORAGE DRAWER ASSY
				2		62	1900345-021	WRITING SURFACE ASSY
				1		61	1900550	GROUND PLATE
				~~2~~		~~60~~	~~1900369~~	~~GASKET-CONNECTOR~~
				1		59	1900368-001	GASKET-CONNECTOR
				4		58	1900368-003	GASKET-CONNECTOR
				9		57	1900368-004	GASKET-CONNECTOR
				6		56	1900368-005	GASKET-CONNECTOR
				84		55	AN363C632 (1896990-261)	NUT, SELF LOCKING
				84		54	AN960C6L (1897006-036)	WASHER, FLAT #6
NOTE 11				84		53	1006783-23	SCREW-BUTTON-HEX. SOC.
						52		
						51		

LIST OF PARTS AND MATERIALS

Ⓓ REPLACES REV (C) WITH CHANGE

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				55		50	MS21919WDG-2 THRU -15 (1897073-202 THRU -215	CLAMP, LOOP TYPE
				1		49	1900379	PANEL (INSEP) ASSY
				11		48	AN960C616 (1897006-062)	WASHER, FLAT
Ⓦ				1		47	1900309-011	PANEL ASSY, CROSSBAR SWITCH COMP
						46		
						45		
				2		44	1900364-031	BLANK PANEL ASSY 7
				1		43	1900364-021	BLANK PANEL ASSY 5 1/4
				1		42	MS171492	PIN
				6		41	MS16995-79	SCREW, SOC HD CAP
				4		40	MS16995-86	SCREW, SOC HD CAP
				8		39	AN363C1032 (1896990-011)	NUT, SELF LOCKING
				2		38	AN335-6	NUT-HEX
NOTE 11				30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
				4		36	-46	
				55		35	-45	
				80		34	-44	
NOTE 11				13		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
				30		32	MS35338-79	WASHER-LOCK #6
				12		31	MS35338-84	WASHER-LOCK 3/8
				126		30	AN960C10L (1897006-019)	WASHER, FLAT #10
				148		29	MS-35338-81	WASHER-LOCK #10
				~~1~~		~~28~~	~~1900345-011~~	~~WRITING SURFACE ASSY~~
				4		27	1900344	NUT BAR
				4		26	1900343	BRACKET
NOTE 11				5		25	1015790-001	NUT BAR
				2		24	1900277	BRACKET
~~NOTE 11~~				~~2~~		~~23~~	~~1015800~~	~~CABLE RETRACTOR~~
				1		22	1900380	PANEL (INSEP) ASSY
				1		21	1900255-011	LATCH ASSY
				1		20	1900080	STUD-GROUND
NOTE 11				7		19	1015918-102	TERMINAL BLOCK ASSY
				1		18	-103	
				1		17	-104	
				1		16	-108	
				1		15	-118	
				3		14	-110	
				1		13	1015918-112	TERMINAL BLOCK ASSY
				29		12	1015991-001	SCREW, HANGER
NOTE 11				4		11	1015819-001	AIR FILTER ASSY, SPECIAL
				1		10	1900175	WIRING HARNESS 'A'
				4		9	1900308	GUIDE
				4		8	1900303	SUPPORT BRACKET R.H.
				2		7	1900304	SUPPORT BRACKET L.H.
				3		6	1900307	SPACER
				1		5	1900198	SPACER
				1		4	1900306	BAR-STOP
				1		3	1900305	SUPPORT SHEET
				1		2	1900064	HARNESS FRAME ASSY
NOTE 11				1		1	1900007	CABINET ASSY, BASIC

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ -
- —	-.02	- -

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN P. T. Wenzing DATE 14 June 63
CHECKED E. Fleming 17 July 63
APPROVAL G. Stephens 18 Jul 63
APPROVAL 8/14/63
8-14-63
NASA APPROVAL
MIT APPROVAL 14 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS - INERTIAL ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE NOTED
SHEET 1 OF 8

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'
3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.
4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.
5. $\boxed{C}$ REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PLATES SUPPLIED WITH ITEM 1 BY VENDOR IN ADDITION TO ITEM (73)
6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)
7. ~~CONNECTOR INSTALLATION:~~
   ~~a. INSTALL J1 THRU J4 INCLUSIVE OF ITEM 2 INTO ITEM 22 AS SHOWN.~~
   ~~b. INSTALL J16 THRU J26 INCLUSIVE OF ITEM 2 INTO ITEM 49 AS SHOWN.~~
   ~~c. INSTALL J5 THRU J15 INCLUSIVE OF ITEM 2 INTO ITEM 74 AS SHOWN.~~
   ~~d. INSTALL GROUND LUGS TO E1 AND E80 AS SHOWN.~~
8. ~~CAUTION: (2) CANNOT BE ASSEMBLED TO (1) WITH PANEL MOUNTING J5 THRU J15 INCLUSIVE, ATTACHED~~
9. AFTER ASSEMBLY OF HARNESS FRAME TO IT. (1) ATTACH RETRACTOR MOUNTED CABLES TO ITEM (12) IN THEIR RESPECTIVE AREAS.
10. ELECTRICAL REQUIREMENTS:
    AFTER INSTALLATION OF (2) OR (81) & (10) PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
    A. *POWER ISOLATION CHECK*
    WITH 500 VOLTS DC APPLIED READ A MINIMUM OF 100 MEGOHMS FROM THE FOLLOW POINTS P89-A,B,C,E & K N,O,P,R,S,T,U, P45-R. P43-S, AND E1 AND BETWEEN EACH OF THESE POINTS.
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
12. MARK CHARACTERS .38 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK ~~(25 PLACES)~~
13. *ADJUST ITEM (26) SO AS TO SUPPORT UNDER SIDE OF ITEMS (28) & (62).*
14. DISPOSE OF EXCESS DRAWER MOUNTING AND RETRACTOR HARDWARE IN AN APPROVED MANNER.

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A	SHT	3
B-B	SHT	4
C-C	SHT	5
D-D	SHT	2
E-E	SHT	6
F-F	SHT	6
G-G	SHT	6
H-H	SHT	6
J-J	SHT	7
K-K	SHT	7
L-L	SHT	7
M-M	SHT	7
N-N	SHT	5
P-P	SHT	5
R-R	SHT	3
S-S	SHT	3
T-T	SHT	4
U-U	SHT	4
V-V	SHT	4
W-W	SHT	6
X-X	SHT	4
Y-Y	SHT	6
Z-Z	SHT	2
AA-AA	SHT	2

DETAILS:

A	SHT	4
B	SHT	3
C	SHT	5
D	SHT	7

PARTIAL VIEWS:

Q-Q SHT 2

NOTES (CONTINUED)

15. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267) AND SERIALIZE PER ND1002023.

15. VENDOR ITEM, SEE SOURCE CONTROL DRAWING.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
(M) AD		CHANGE IN ACCORDANCE WITH CM 197061		23 JUN 64	BK
(M) AE		CHANGE IN ACCORDANCE WITH CM 197640 REVISED PER TORR [illegible]	—	[illegible] 64	
(M) AF		CHANGE IN ACCORDANCE WITH CM 199907 TORR 13084	—	2 SEP 64	RJF
AG		REVISED PER TORR 14425	—	1 DEC 64	EF

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
(D) D		REPLACES REVISION "C" WITH CHANGE PER MXC 188271	TORR 02580	30 JUL 63	C.A.M. / EF
				14 AUG 63	WK
E		CHANGE IN ACCORDANCE WITH MXC 189072		3 SEP 63	AU
-	-	ADDED CUSTOMERS DATA (V 6-63)	—	4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G	-	CHANGE IN ACCORDANCE WITH MXC 189686	—	9 SEP 63	V.J.J. / AU
H	-	CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
J	-	CHANGE IN ACCORDANCE WITH MXC 191867	—	6 NOV 63	
K		CHANGE IN ACCORDANCE WITH CM 192872		10 JAN 64	E M / R.D.
L		REVISION STATUS CHANGED PER CM 192872		10 JAN 64	E M. / R.D.
M		REVISION STATUS CHANGED PER CM 193187		13 JAN 64	E M
N		ITEM 15 WAS 1015918-109 PER CM 193580		14 JAN 64	E.M.
P	—	CHANGE IN ACCORDANCE WITH CM-193681		24 JAN 64	J.B.
R	—	CHANGE IN ACCORDANCE WITH CM-193683		28 JAN 64	J.B.
S	—	CHANGE IN ACCORDANCE WITH CM-194362		28 JAN 64	J.B.
(M) T	-	CHANGE IN ACCORDANCE WITH CM-194739 REVISE PER TORR C747C		3 FEB 64 4-7-64	
U		CHANGE IN ACCORDANCE WITH CM 195566 ADDED CUSTOMER DATA (V2-64)		22 APR 64	J.C. / CP
V		CHANGE IN ACCORDANCE WITH CM 195662 TORR 10722		11 MAY 64	
W	E-3	CHANGE IN ACCORDANCE WITH CM 195957 TORR 10723		28 MAY 64	BK / CP
Y	A-8	CHANGE IN ACCORDANCE WITH CM 196077 TORR 10724		2 JUN 64	FL / EF
Z		CHANGE IN ACCORDANCE WITH CM 196261 TORR 10725		10 JUN 64	RB.
AA		CHANGE IN ACCORDANCE WITH CM 196320 TORR 10725		16 JUN 64	BK
(M) AB		CHANGE IN ACCORDANCE WITH CM 196322 TORR 10726		18 JUN 64	JJJ / EF
(M) AC		CHANGE IN ACCORDANCE WITH CM 196488 TORR 10727	—	19 JUN 64	JJJ / MEM

(D) REPLACES REV (C) WITH CHANGE

SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8
AG	AF	T	U	AG	AC	AC	L
AF	AF	T	U	AF	AC	AC	L
AE	AE	T	U	AD	AC	AC	L
AD	AD	T	U	AD	AC	AC	L
AC	Y	T	U	R	AC	AC	L
AB	Y	T	U	R	Z	P	L
AA	Y	T	U	R	Z	P	L
Z	Y	T	U	R	Z	P	L
Y	Y	T	U	R	L	P	L
W	W	T	U	R	L	P	L
V	R	T	U	R	L	P	L
U	R	T	U	R	L	P	L
S	R	L	S	R	L	P	L
R	R	L	P	R	L	P	L
P	M	L	P	H	L	P	L
N	M	L	L	H	L	L	L
M	M	L	L	H	L	L	L
L	L	L	L	H	L	L	L
K	H	D	H	H	K	K	K
J	H	D	H	H	D	E	E
H	H	D	H	H	D	E	E
G	G	D	E	E	D	E	E
F	F	D	E	E	D	E	E
E	E	D	E	E	D	E	E
D	D	D	D	D	D	D	D

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 DATE 14 Aug 63

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 021	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1			81	1900064-021	HARNESS FRAME ASSY
	1	1		80	1901687	PLATE, INSTRUCTION
	1	1		79	1901657	INSULATOR BUSHING
	1	1		78	1901656	INSULATOR PAD
		~~1~~		~~77~~	~~1015790-002~~	~~NUT BAR~~
NOTE 11	2	2		76	1015800-001	CABLE RETRACTOR
	5	5		75	1900369	GASKET - CONNECTOR
	1	1		74	1900365	PANEL ASS'Y (INSEP)
NOTE 5, 15	17	17		73	1901346	PLATE, CLOSURE
NOTE 11	21	21		72	1006783-29	SCREW-BUTTON-HEX. SOC.
	43	43		71	AN363C832 (1896990-281)	NUT, SELF LOCKING
	12	12		70	MS-35234-60	SCREW, PAN HEAD
	2	2		69	1900973	DEFLECTOR, AIR
	37	37		68	AN960C8L (1897006-038)	WASHER, FLAT
NOTE 11	37	37		67	1006783-27	SCREW-BUTTON-HEX SOC
	36	36		66	MS 35338-80	WASHER-LOCK
	1	1		65	1900368-009	GASKET-CONNECTOR
	1	1		64	1900569	STORAGE DRAWER ASSY
	1	1		63	1900568	STORAGE DRAWER ASSY
	2	2		62	1900345-021	WRITING SURFACE ASSY
	1	1		61	1900550	GROUND PLATE
		~~2~~		~~60~~	~~1900369~~	~~GASKET-CONNECTOR~~
	1	1		59	1900368-001	GASKET-CONNECTOR
	4	4		58	1900368-003	GASKET-CONNECTOR
	9	9		57	1900368-004	GASKET-CONNECTOR
	6	6		56	1900368-005	GASKET-CONNECTOR
	84	84		55	AN363C632 (1896990-261)	NUT, SELF LOCKING
	84	84		54	AN960C6L (1897006-036)	WASHER, FLAT #6
NOTE 11	84	84		53	1006783-23	SCREW-BUTTON-HEX. SOC.
				52		
				51		
	55	55		50	MS21919WDG-2 THRU -15 (1897073-202 THRU -215)	CLAMP, LOOP TYPE
	1	1		49	1900379	PANEL (INSEP) ASSY
	13	13		48	AN960C616 (1897006-062)	WASHER, FLAT
(W)	1	1		47	1900309-011	PANEL ASSY, CROSSBAR SWITCH COMP
				46		
				45		
	2	2		44	1900364-031	BLANK PANEL ASSY 7
	1	1		43	1900364-021	BLANK PANEL ASSY 5 1/4
	3	3		42	MS171492	PIN
	6	6		41	MS16995-79	SCREW, SOC HD CAP
	4	4		40	MS16995-86	SCREW, SOC HD CAP
	8	8		39	AN363C1032 (1896990-011)	NUT, SELF LOCKING
	5	5		38	AN335-6	NUT-HEX
NOTE 11	30	30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
↕	4	4		36	↕ -46	↕
↕	55	55		35	↕ -45	↕
↕	72	72		34	↕ -44	↕
NOTE 11	13	13		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
	30	30		32	MS35338-79	WASHER-LOCK #6
	13	13		31	MS35338-84	WASHER-LOCK 3/8
	118	118		30	AN960C10L (1897006-019)	WASHER, FLAT #10
	140	140		29	MS-35338-81	WASHER-LOCK #10
		~~1~~		~~28~~	~~1900345-011~~	~~WRITING SURFACE ASSY~~
	4	4		27	1900344	NUT BAR
	4	4		26	1900343	BRACKET
NOTE 11	4	4		25	1015790-001	NUT BAR
	2	2		24	1900277	BRACKET
~~NOTE 11~~		~~2~~		~~23~~	~~1015800~~	~~CABLE RETRACTOR~~
	1	1		22	1900380	PANEL (INSEP) ASSY
	1	1		21	1900255-011	LATCH ASSY
	2	2		20	1900080	STUD-GROUND
NOTE 11	7	7		19	1015918-102	TERMINAL BLOCK ASSY
↕	1	1		18	↕ -103	↕
↕	1	1		17	↕ -104	↕
↕	1	1		16	↕ -108	↕
↕	1	1		15	↕ -118	↕
↕	3	3		14	↕ -110	↕
↕	1	1		13	1015918-112	TERMINAL BLOCK ASSY
↕	29	29		12	1015991-001	SCREW, HANGER
NOTE 11	4	4		11	1015819-001	AIR FILTER ASSY, SPECIAL
	1	1		10	1900175	WIRING HARNESS 'A'
	4	4		9	1900308	GUIDE
	2	2		8	1900303	SUPPORT BRACKET R.H.
	2	2		7	1900304	SUPPORT BRACKET L.H.
	3	3		6	1900307	SPACER
	1	1		5	1900198	SPACER
	1	1		4	1900306	BAR-STOP
	1	1		3	1900305	SUPPORT SHEET
		1		2	1900064-011	HARNESS FRAME ASSY
NOTE 11	1	1		1	1900007	CABINET ASSY, BASIC

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-021	1900004-021	021
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ -
— —	-.02	- -

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN P.T. Werginz 14 JUNE 63
CHECKED E. Fleming 17 JULY 63
APPROVAL G. Stoppared 18 JUL 63
APPROVAL [illegible] 8-14-63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 14 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

CABINET ASSEMBLY -
ELECTRICAL EQUIPMENT
OPTICS - INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO
SIZE E
1900031
SCALE NOTED
SHEET 1 OF 8

1900031

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'

3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.

4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.

5. $\boxed{C}$ REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PLATES SUPPLIED WITH ITEM 1 BY VENDOR IN ADDITION TO ITEM (73)

6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)

7. CONNECTOR INSTALLATION:
   INSTALL J1 THRU J4 INCLUSIVE OF ② INTO (22) AS SHOWN.
   INSTALL J16 THRU J26 INCLUSIVE OF ② INTO (49) AS SHOWN.
   INSTALL J5 THRU J15 INCLUSIVE OF ② INTO (74) AS SHOWN.

~~8. CAUTION: ② CANNOT BE ASSEMBLED TO ① WITH PANEL MOUNTING J5 THRU J15 INCLUSIVE, ATTACHED.~~

9. AFTER ASSEMBLY OF ② TO ①, ATTACH RETRACTOR MOUNTED CABLES, OF ②, TO (12) IN THEIR RESPECTIVE AREAS.

10. ELECTRICAL REQUIREMENTS:
    AFTER INSTALLATION OF ② & (10) PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
    A. *POWER ISOLATION CHECK*
    WITH 500 VOLTS DC APPLIED READ A MINIMUM OF 100 MEGOHMS FROM THE FOLLOW POINTS P89-A,B,C,E & K N,O,P,R,S,T,U, P45-R, P43-S, & E1 AND BETWEEN EACH OF THESE POINTS.

11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.

12. MARK CHARACTERS .38 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK ~~(25 PLACES)~~

13. *ADJUST ITEM (26) SO AS TO SUPPORT UNDER SIDE OF ITEMS (28) & (62).*

14. DISPOSE OF EXCESS DRAWER MOUNTING AND RETRACTOR HARDWARE IN AN APPROVED MANNER.

NOTES (CONTINUED)

15. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267) AND SERIALIZE PER ND1002023.

15. VENDOR ITEM, SEE SOURCE CONTROL DRAWING

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A	SHT	3
B-B	SHT	4
C-C	SHT	5
D-D	SHT	2
E-E	SHT	6
F-F	SHT	6
G-G	SHT	6
H-H	SHT	6
J-J	SHT	7
K-K	SHT	7
L-L	SHT	7
M-M	SHT	7
N-N	SHT	5
P-P	SHT	5
R-R	SHT	3
S-S	SHT	3
T-T	SHT	4
U-U	SHT	4
V-V	SHT	4
W-W	SHT	6
X-X	SHT	4
Y-Y	SHT	6
Z-Z	SHT	2

DETAILS:

A	SHT	4
B	SHT	3
C	SHT	5
D	SHT	7

PARTIAL VIEWS:

Q-Q	SHT	2

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
Ⓒ D		*REPLACES REVISION "C" WITH CHANGE PER MXC 188271*	TDRR 0258D	30 JUL 63	C.A.M. EF
				14 AUG 63	WK
E		CHANGE IN ACCORDANCE WITH MXC 189072		3 SEP 63	AU
-	-	ADDED CUSTOMERS DATA (V 6-63)	—	4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G	-	CHANGE IN ACCORDANCE WITH MXC 189686	—	9 SEP 63	V.J.J. AU
H	-	CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
J	—	CHANGE IN ACCORDANCE WITH MXC 191967	—	6 Nov 63	WSM
K		CHANGE IN ACCORDANCE WITH CM 192872		JAN 64	EM R.D.
L		REVISION STATUS CHANGED PER CM 92872		JAN 64	E.M. R.D.
M		REVISION STATUS CHANGED PER CM 193187		13 JAN 64	E.M.
N		*ITEM 15 WAS 1015918-109 PER CM 193580*		14 JAN 64	E.M.
P	—	CHANGE IN ACCORDANCE WITH CM-193681		24-JAN-64	J.B.
R	—	CHANGE IN ACCORDANCE WITH CM-193683		28-JAN-64	J.B.
S	—	CHANGE IN ACCORDANCE WITH CM-194362		28-JAN-64	J.B.
Ⓜ T	-	CHANGE IN ACCORDANCE WITH CM-194739 *REVISE PER TDRR 0747C*		3 FEB 64 4-7-64	
U		CHANGE IN ACCORDANCE WITH CM 195566 ADDED CUSTOMER DATA (V2-64) 10721		22 APR 64	J.C. CP
V		CHANGE IN ACCORDANCE WITH CM 195062 10722		11 MAY 64	
W	E-3	CHANGE IN ACCORDANCE WITH CM 195957 10723		28 MAY 64	BK CP
Y	A-8	CHANGE IN ACCORDANCE WITH CM 196077 10724		2 JUN 64	FL EF
Z		CHANGE IN ACCORDANCE WITH CM 196261 10725		10 JUN 64	RB. RWH
AA		CHANGE IN ACCORDANCE WITH CM 196320		16 JUN 64	BK
AB		CHANGE IN ACCORDANCE WITH CM 196322 10726		18 JUN 64	JJJ EF
AC		CHANGE IN ACCORDANCE WITH CM 196488 10727	—	19 JUN 64	JJJ MEM

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8
AC	Y	T	U	R	AC	AC	L
AB	Y	T	U	R	Z	P	L
AA	Y	T	U	R	Z	P	L
Z	Y	T	U	R	Z	P	L
Y	Y	T	U	R	L	P	L
W	W	T	U	R	L	P	L
V	R	T	U	R	L	P	L
U	R	T	U	R	L	P	L
S	R	L	S	R	L	P	L
R	R	L	P	R	L	P	L
P	M	L	P	H	L	P	L
N	M	L	L	H	L	L	L
M	M	L	L	H	L	L	L
L	L	L	L	H	L	L	L
K	H	D	H	H	K	K	K
J	H	D	H	H	D	E	E
H	H	D	H	H	D	E	E
G	G	D	E	E	D	E	E
F	F	D	E	E	D	E	E
E	E	D	E	E	D	E	E
D	D	D	D	D	D	D	D

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0258D **DATE** 14 Aug 63

Ⓓ REPLACES REV (C) WITH CHANGE

				011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				55		50	MS21919WDG-2 THRU -15 (1897073-202 THRU -215	CLAMP, LOOP TYPE
				1		49	1900379	PANEL (INSEP) ASSY
				11		48	AN960C616 (1897006-062)	WASHER, FLAT
Ⓦ				1		47	1900309-011	*PANEL ASSY, CROSSBAR SWITCH COMP*
						46		
						45		
				2		44	1900364-031	BLANK PANEL ASSY 7
				1		43	1900364-021	BLANK PANEL ASSY 5 1/4
				1		42	MS171492	PIN
				6		41	MS16995-79	SCREW, SOC HD CAP
				4		40	MS16995-86	SCREW, SOC HD CAP
				8		39	AN363C1032 (1896990-011)	NUT, SELF LOCKING
				2		38	AN335-6	NUT-HEX
NOTE 11				30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
				4		36	-46	
				55		35	-45	
				72		34	-44	
NOTE 11				13		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
				30		32	MS35338-79	WASHER-LOCK #6
				12		31	MS35338-84	WASHER-LOCK 3/8
				118		30	AN960C10L (1897006-019)	WASHER, FLAT #10
				140		29	MS-35338-81	WASHER-LOCK #10
				~~1~~		~~28~~	~~1900345-011~~	~~WRITING SURFACE ASSY~~
				4		27	1900344	NUT BAR
				4		26	1900343	BRACKET
NOTE 11				4		25	1015790-001	NUT BAR
				2		24	1900277	BRACKET
~~NOTE 11~~				~~2~~		~~23~~	~~1015800~~	~~CABLE RETRACTOR~~
				1		22	1900380	PANEL (INSEP) ASSY
				1		21	1900255-011	LATCH ASSY
				1		20	1900080	STUD-GROUND
NOTE 11				7		19	1015918-102	TERMINAL BLOCK ASSY
				1		18	-103	
				1		17	-104	
				1		16	-108	
				1		15	-118	
				3		14	-110	
				1		13	1015918-112	TERMINAL BLOCK ASSY
				29		12	1015991-001	SCREW, HANGER
NOTE 11				4		11	1015819-001	AIR FILTER ASSY, SPECIAL
				1		10	1900175	WIRING HARNESS 'A'
				4		9	1900308	GUIDE
				2		8	1900303	SUPPORT BRACKET R.H.
				2		7	1900304	SUPPORT BRACKET L.H.
				3		6	1900307	SPACER
				1		5	1900198	SPACER
				1		4	1900306	BAR-STOP
				1		3	1900305	SUPPORT SHEET
				1		2	1900064	HARNESS FRAME ASSY
NOTE 11				1		1	1900007	CABINET ASSY, BASIC

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

				011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				~~1~~		~~77~~	~~1015790-002~~	~~NUT BAR~~
NOTE 11				2		76	1015800-001	CABLE RETRACTOR
				5		75	1900369	GASKET - CONNECTOR
				1		74	1900365	PANEL ASS'Y (INSEP)
NOTE 5, 15				17		73	1901346	PLATE, CLOSURE
NOTE 11				21		72	1006783-29	SCREW-BUTTON-HEX. SOC.
				43		71	AN363C832 (1896990-281)	NUT, SELF LOCKING
				12		70	MS-35234-60	SCREW, PAN HEAD
				2		69	1900973	DEFLECTOR, AIR
				37		68	AN960C8L (1897006-038)	WASHER, FLAT
NOTE 11				37		67	1006783-27	SCREW-BUTTON-HEX SOC
				36		66	MS35338-80	WASHER-LOCK
				1		65	1900368-009	GASKET-CONNECTOR
				1		64	1900569	STORAGE DRAWER ASSY
				1		63	1900568	STORAGE DRAWER ASSY
				2		62	1900345-021	WRITING SURFACE ASSY
				1		61	1900550	GROUND PLATE
				~~2~~		~~60~~	~~1900369~~	~~GASKET-CONNECTOR~~
				1		59	1900368-001	GASKET-CONNECTOR
				4		58	1900368-003	GASKET-CONNECTOR
				9		57	1900368-004	GASKET-CONNECTOR
				6		56	1900368-005	GASKET-CONNECTOR
				84		55	AN363C632 (1896990-261)	NUT, SELF LOCKING
				84		54	AN960C6L (1897006-036)	WASHER, FLAT #6
NOTE 11				84		53	1006783-23	SCREW-BUTTON-HEX. SOC.
						52		
						51		

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900064-011	1900064-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ −	+.02	+ −
− −	−.02	− −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN P. T. Werginz DATE 14 June 63
CHECKED E. Fleming 17 JULY 63
APPROVAL G. Stepanek 18 Jul 63
APPROVAL
8-14-63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS - INERTIAL ANALYZER ASSEMBLY

CODE IDENT NO. | SIZE E | 1900031

SCALE NOTED | SHEET 1 OF 8

1900031 AC

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
AD		CHANGE IN ACCORDANCE WITH CM 197061 11375		24 JUN 64	BK

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		REPLACES REVISION "C" WITH CHANGE PER MXC 188271	TDRR 02580	30 JUL 63	C.A.M. EF
				14 AUG 63	WR
E		CHANGE IN ACCORDANCE WITH MXC 189072		3 SEP 63	AU
-	-	ADDED CUSTOMERS DATA (V 6-63)	—	4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G	-	CHANGE IN ACCORDANCE WITH MXC 189686	—	9 SEP 63	J.J. AU
H	-	CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
J	—	CHANGE IN ACCORDANCE WITH MXC 191867	—	6 NOV 63	
K		CHANGE IN ACCORDANCE WITH CM 192872		JAN 64	E M R.D.
L		REVISION STATUS CHANGED PER CM 92872		10 JAN 64	E M. R.D.
M		REVISION STATUS CHANGED PER CM 193187		13 JAN 64	E M
N		ITEM 15 WAS 1015918-109 PER CM 193580		14 JAN 64	E.M.
P	—	CHANGE IN ACCORDANCE WITH CM-193681		24 JAN 64	J.B.
R	—	CHANGE IN ACCORDANCE WITH CM-193683		28 JAN 64	J.B.
S	—	CHANGE IN ACCORDANCE WITH CM-194362		28 JAN 64	J.B.
T	—	CHANGE IN ACCORDANCE WITH CM-194739 REVISE PER TDRR C7470		3 FEB 64 4-7-64	
U		CHANGE IN ACCORDANCE WITH CM 195566 TDRR 10721 ADDED CUSTOMER DATA (V2-64)		22 APR 64	J.C. CP
V		CHANGE IN ACCORDANCE WITH CM 195662 TDRR 10722		11 MAY 64	
W	E-3	CHANGE IN ACCORDANCE WITH CM 195957 TDRR 10723		28 MAY 64	BK CP
Y	A-8	CHANGE IN ACCORDANCE WITH CM 196077 TDRR 10724		2 JUN 64	FL EF
Z		CHANGE IN ACCORDANCE WITH CM 196261 TDRR 10725		10 JUN 64	RB RWK
AA		CHANGE IN ACCORDANCE WITH CM 196320 TDRR 10726		16 JUN 64	BK
AB		CHANGE IN ACCORDANCE WITH CM 196322 TDRR 10726		18 JUN 64	JJJ EF
AC		CHANGE IN ACCORDANCE WITH CM 196488 TDRR 10727	—	19 JUN 64	JJJ MEM

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'
3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.
4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.
5. $\boxed{C}$ REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PLATES SUPPLIED WITH ITEM 1 BY VENDOR IN ADDITION TO ITEM (73)
6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)
7. CONNECTOR INSTALLATION:
   a. INSTALL J1 THRU J4 INCLUSIVE OF ITEM 2 INTO ITEM 22 AS SHOWN.
   b. INSTALL J16 THRU J26 INCLUSIVE OF ITEM 2 INTO ITEM 49 AS SHOWN.
   c. INSTALL J5 THRU J15 INCLUSIVE OF ITEM 2 INTO ITEM 74 AS SHOWN.
   d. INSTALL GROUND LUGS TO E1 AND E80 AS SHOWN.

~~8. CAUTION: (2) CANNOT BE ASSEMBLED TO (1) WITH PANEL MOUNTING J5 THRU J15 INCLUSIVE, ATTACHED~~

9. AFTER ASSEMBLY OF (2) TO (1), ATTACH RETRACTOR MOUNTED CABLES, OF (2), TO (12) IN THEIR RESPECTIVE AREAS.
10. ELECTRICAL REQUIREMENTS:
    AFTER INSTALLATION OF (2) & (10) PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
    A. POWER ISOLATION CHECK
    WITH 500 VOLTS DC APPLIED READ A MINIMUM OF 100 MEGOHMS FROM THE FOLLOW POINTS P89-A,B,C,E & K N,O,P,R,S,T,U, P45-R, P43-S, & E1 AND BETWEEN EACH OF THESE POINTS.
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
12. MARK CHARACTERS .38 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK ~~(25 PLACES)~~
13. ADJUST ITEM (26) SO AS TO SUPPORT UNDER SIDE OF ITEMS (28) & (62).
14. DISPOSE OF EXCESS DRAWER MOUNTING AND RETRACTOR HARDWARE IN AN APPROVED MANNER.

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A SHT 3
B-B SHT 4
C-C SHT 5
D-D SHT 2
E-E SHT 6
F-F SHT 6
G-G SHT 6
H-H SHT 6
J-J SHT 7
K-K SHT 7
L-L SHT 7
M-M SHT 7
N-N SHT 5
P-P SHT 5
R-R SHT 3
S-S SHT 3
T-T SHT 4
U-U SHT 4
V-V SHT 4
W-W SHT 6
X-X SHT 4
Y-Y SHT 6
Z-Z SHT 2
AA-AA SHT 2

DETAILS:

A SHT 4
B SHT 3
C SHT 5
D SHT 7

PARTIAL VIEWS:

Q-Q SHT 2

NOTES (CONTINUED)

15. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267) AND SERIALIZE PER ND1002023.
15. VENDOR ITEM, SEE SOURCE CONTROL DRAWING.

SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8
AD	AD	T	U	AD	AC	AC	L
AC	Y	T	U	R	AC	AC	L
AB	Y	T	U	R	Z	P	L
AA	Y	T	U	R	Z	P	L
Z	Y	T	U	R	Z	P	L
Y	Y	T	U	R	L	P	L
W	W	T	U	R	L	P	L
V	R	T	U	R	L	P	L
U	R	T	U	R	L	P	L
S	R	L	S	R	L	P	L
R	R	L	P	R	L	P	L
P	M	L	P	H	L	P	L
N	M	L	L	H	L	L	L
M	M	L	L	H	L	L	L
L	L	L	L	H	L	L	L
K	H	D	H	H	K	K	K
J	H	D	H	H	D	E	E
H	H	D	H	H	D	E	E
G	G	D	E	E	D	E	E
F	F	D	E	E	D	E	E
E	E	D	E	E	D	E	E
D	D	D	D	D	D	D	D

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0258 **DATE** 14 Aug 63

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1		79	1901657	INSULATOR BUSHING
				1		78	1901656	INSULATOR PAD
				~~1~~		~~77~~	~~1015790-002~~	~~NUT BAR~~
NOTE 11				2		76	1015800-001	CABLE RETRACTOR
				5		75	1900369	GASKET - CONNECTOR
				1		74	1900365	PANEL ASS'Y (INSEP)
NOTE 5, 15				17		73	1901346	PLATE, CLOSURE
NOTE 11				21		72	1006783-29	SCREW-BUTTON-HEX. SOC
				43		71	AN363C832 (1896990-281)	NUT, SELF LOCKING
				12		70	MS-35234-60	SCREW, PAN HEAD
				2		69	1900973	DEFLECTOR, AIR
				37		68	AN960C8L (1897006-038)	WASHER, FLAT
NOTE 11				37		67	1006783-27	SCREW-BUTTON-HEX SOC
				36		66	MS35338-80	WASHER-LOCK
				1		65	1900368-009	GASKET-CONNECTOR
				1		64	1900569	STORAGE DRAWER ASSY
				1		63	1900568	STORAGE DRAWER ASSY
				2		62	1900345-021	WRITING SURFACE ASSY
				1		61	1900550	GROUND PLATE
				~~2~~		~~60~~	~~1900369~~	~~GASKET-CONNECTOR~~
				1		59	1900368-001	GASKET-CONNECTOR
				4		58	1900368-003	GASKET-CONNECTOR
				9		57	1900368-004	GASKET-CONNECTOR
				6		56	1900368-005	GASKET-CONNECTOR
				84		55	AN363C632 (1896990-261)	NUT, SELF LOCKING
				84		54	AN960C6L (1897006-036)	WASHER, FLAT #6
NOTE 11				84		53	1006783-23	SCREW-BUTTON-HEX. SOC.
						52		
						51		

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

(D) REPLACES REV (C) WITH CHANGE

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				55		50	MS21919WDG-2 THRU -15 (1897073-202 THRU -215	CLAMP, LOOP TYPE
				1		49	1900379	PANEL (INSEP) ASSY
				13		48	AN960C616 (1897006-062)	WASHER, FLAT
(W)				1		47	1900309-011	PANEL ASSY, CROSSBAR SWITCH COMP
						46		
						45		
				2		44	1900364-031	BLANK PANEL ASSY 7
				1		43	1900364-021	BLANK PANEL ASSY 5 1/4
				3		42	MS171492	PIN
				6		41	MS16995-79	SCREW, SOC HD CAP
				4		40	MS16995-86	SCREW, SOC HD CAP
				8		39	AN363C1032 (1896990-011)	NUT, SELF LOCKING
				5		38	AN335-6	NUT-HEX
NOTE 11				30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
				4		36	-46	
				55		35	-45	
				72		34	-44	
NOTE 11				13		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
				30		32	MS35338-79	WASHER-LOCK #6
				13		31	MS35338-84	WASHER-LOCK 3/8
				118		30	AN960C10L (1897006-019)	WASHER, FLAT #10
				140		29	MS-35338-81	WASHER-LOCK #10
				~~1~~		~~28~~	~~1900345-011~~	~~WRITING SURFACE ASSY~~
				4		27	1900344	NUT BAR
				4		26	1900343	BRACKET
NOTE 11				4		25	1015790-001	NUT BAR
				2		24	1900277	BRACKET
~~NOTE 11~~				~~2~~		~~23~~	~~1015800~~	~~CABLE RETRACTOR~~
				1		22	1900380	PANEL (INSEP) ASSY
				1		21	1900255-011	LATCH ASSY
				2		20	1900080	STUD-GROUND
NOTE 11				7		19	1015918-102	TERMINAL BLOCK ASSY
				1		18	-103	
				1		17	-104	
				1		16	-108	
				1		15	-118	
				3		14	-110	
NOTE 11				1		13	1015918-112	TERMINAL BLOCK ASSY
				29		12	1015991-001	SCREW, HANGER
				4		11	1015819-001	AIR FILTER ASSY, SPECIAL
				1		10	1900175	WIRING HARNESS 'A'
				4		9	1900308	GUIDE
				2		8	1900303	SUPPORT BRACKET R.H.
				2		7	1900304	SUPPORT BRACKET L.H.
				3		6	1900307	SPACER
				1		5	1900198	SPACER
				1		4	1900306	BAR-STOP
				1		3	1900305	SUPPORT SHEET
				1		2	1900064	HARNESS FRAME ASSY
NOTE 11				1		1	1900007	CABINET ASSY, BASIC

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900064-011	[illegible]	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ −	+.02	+ −
− −	−.02	− −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN P. T. Wering DATE 14 JUNE 63
CHECKED E. Fleming 17 JULY 63
APPROVAL G. Stoddard 19 Jul 63
APPROVAL
NASA APPROVAL 8-14-63
MIT APPROVAL

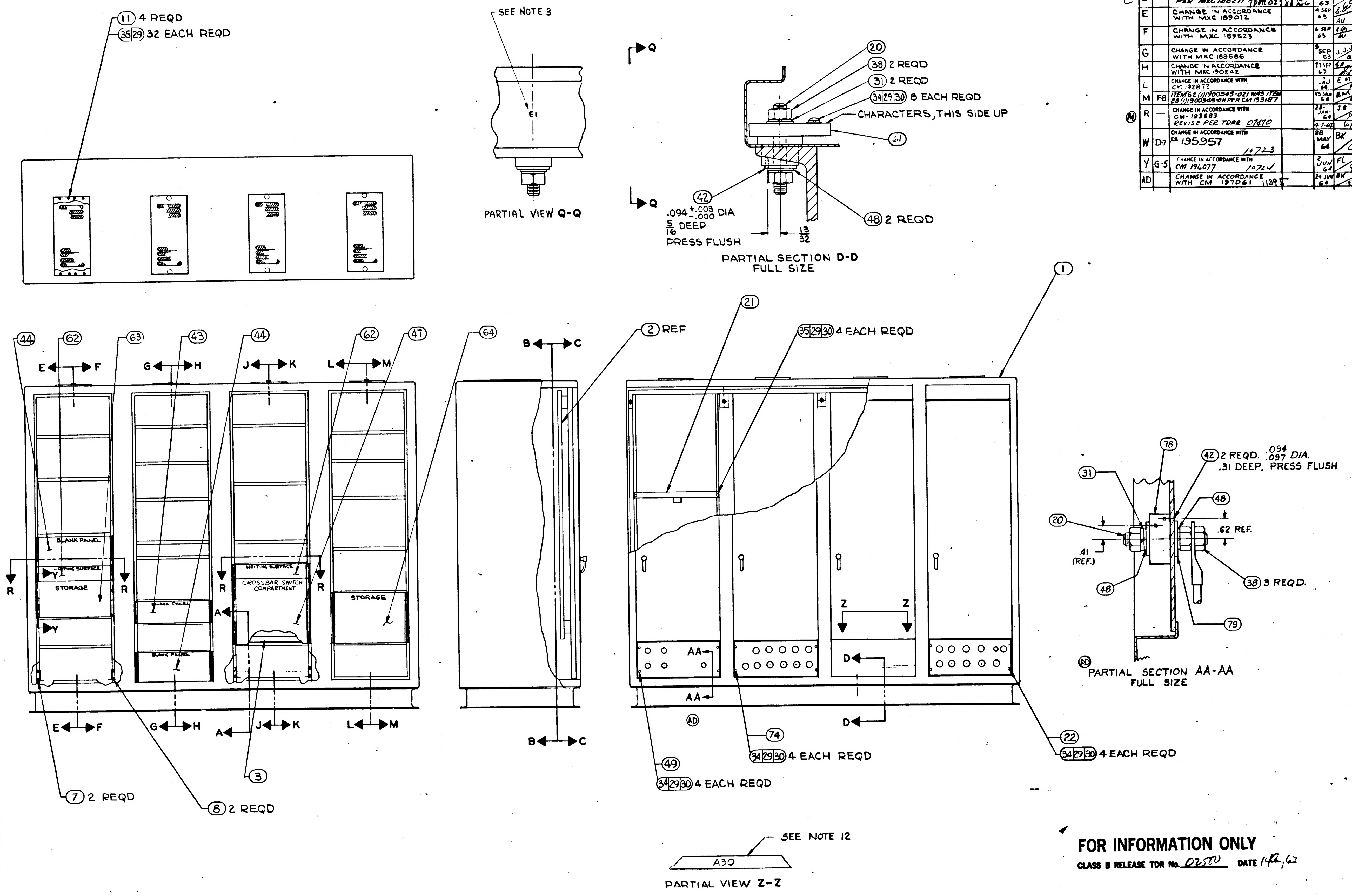
MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS - INERTIAL ANALYZER ASSEMBLY

CODE IDENT NO
SIZE E
1900031
SCALE NOTED
SHEET 1 OF 8

AD
1900031

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271 TDRR 02580	14 AUG	30 JUL 63	C.A.M.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G		CHANGE IN ACCORDANCE WITH MXC 189686		9 SEP 63	J.J.J.
H		CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
L		CHANGE IN ACCORDANCE WITH CM 192872		10 JAN 64	EM R.D.
M	F8	ITEM 62 (1) 1900345-021 WAS ITEM 28 (1) 1900345-011 PER CM 193187		13 JAN 64	EM
R	—	CHANGE IN ACCORDANCE WITH CM-193683 REVISE PER TDRR 07470		28-JAN-64 4-7-64	J.B. WK
W	D7	CHANGE IN ACCORDANCE WITH CM 195957 10723		28 MAY 64	BK CP
Y	G-5	CHANGE IN ACCORDANCE WITH CM 196077 10724		2 JUN 64	FL
AD		CHANGE IN ACCORDANCE WITH CM 197061 11395		24 JUN 64	BK



(11) 4 REQD
(35)(29) 32 EACH REQD
SEE NOTE 3
E1
PARTIAL VIEW Q-Q
Q
Q
(20)
(38) 2 REQD
(31) 2 REQD
(34)(29)(30) 8 EACH REQD
CHARACTERS, THIS SIDE UP
(61)
(42)
.094 +.003 -.000 DIA
5/16 DEEP
PRESS FLUSH
13/32
(48) 2 REQD
PARTIAL SECTION D-D
FULL SIZE
(1)
(44)
(62)
(63)
(43)
(44)
(62)
(47)
(64)
(2) REF
(21)
(35)(29)(30) 4 EACH REQD
E F
G H
J K
L M
B C
BLANK PANEL
WRITING SURFACE
Y
STORAGE
R R
BLANK PANEL
BLANK PANEL
WRITING SURFACE
CROSSBAR SWITCH COMPARTMENT
A
STORAGE
Y
Z Z
AA
AA
D
D
(AD)
E F
G H
A J K
L M
B C
(3)
(7) 2 REQD
(8) 2 REQD
(74)
(34)(29)(30) 4 EACH REQD
(49)
(34)(29)(30) 4 EACH REQD
(22)
(34)(29)(30) 4 EACH REQD
(78)
(42) 2 REQD. .094 .097 DIA.
.31 DEEP, PRESS FLUSH
(31)
(48)
(20)
.62 REF.
.41 (REF.)
(48)
(38) 3 REQD.
(79)
(AD)
PARTIAL SECTION AA-AA
FULL SIZE
SEE NOTE 12
A30
PARTIAL VIEW Z-Z

FOR INFORMATION ONLY

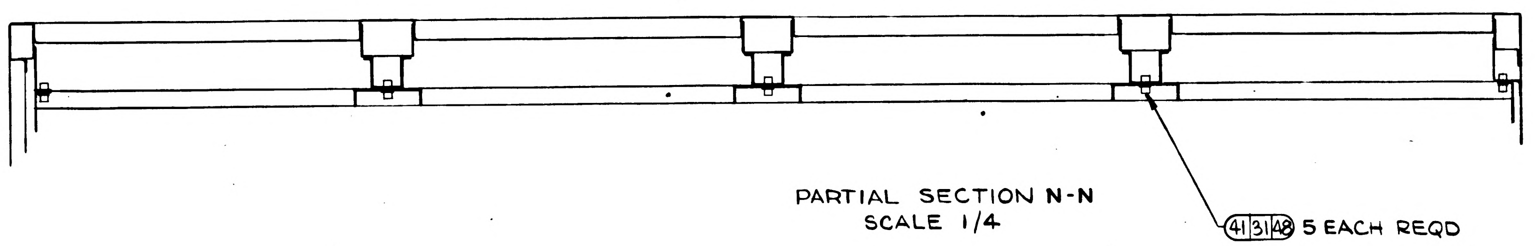
CLASS B RELEASE TDR No. 02580 **DATE** 14 Aug 63

Ⓓ **THIS SHEET ADDED**

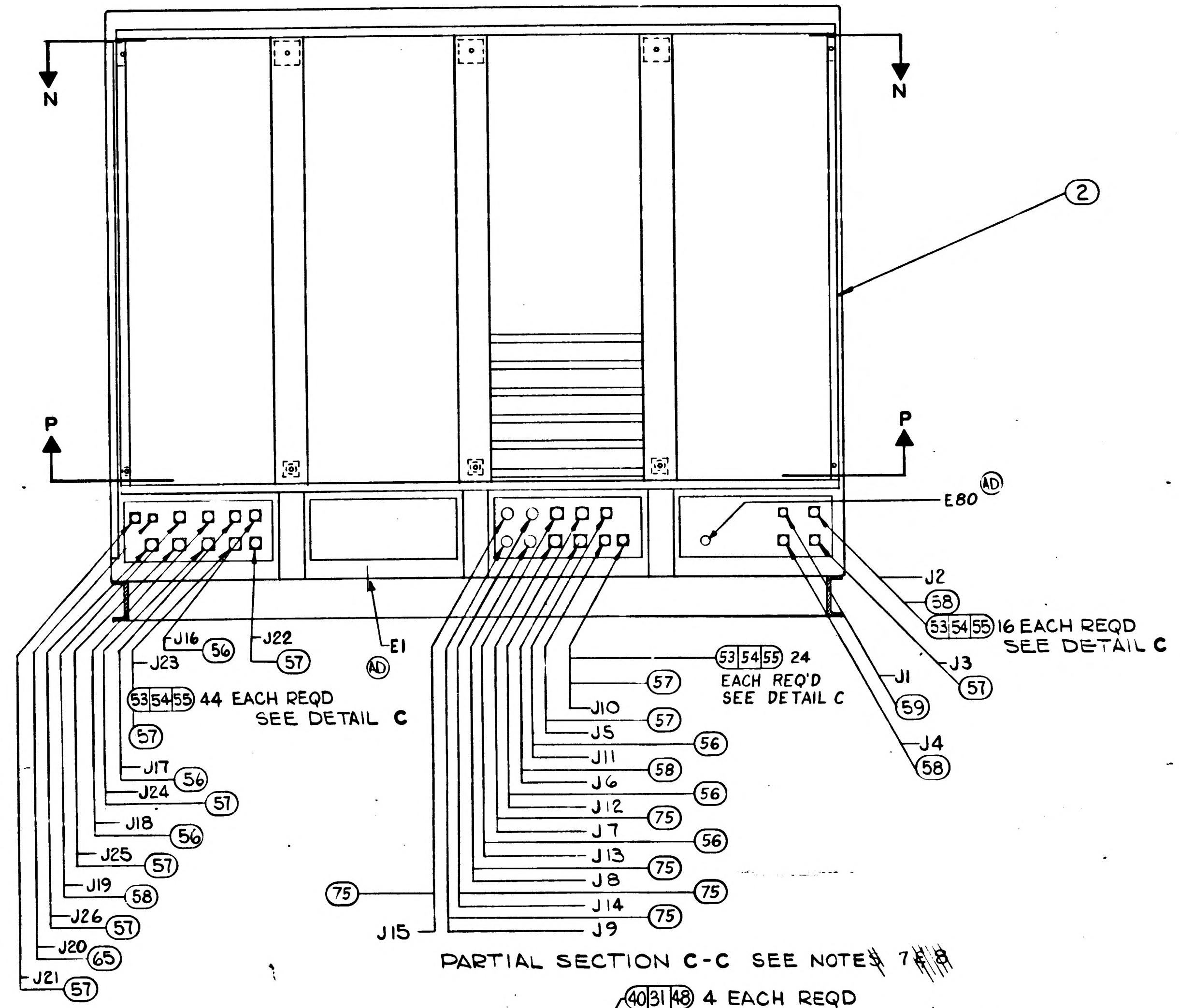
NEXT ASSY / USED ON / APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − − − DECIMALS +.02 −.02 ANGLES + − − − DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN T. Wagins DATE 14 JUNE 63 CHECKED E. Fleming 7 JULY 63 APPROVAL G. STODDARD 18 Jul 63 APPROVAL	MANNED SPACECRAFT CENTER HOUSTON TEXAS	CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS INERTIAL ANALYZER ASSEMBLY
	MATERIAL CONTRACT NAS9-497	NASA APPROVAL 8-14-63 MIT APPROVAL	CODE IDENT NO SCALE NOTED	SIZE E 1900031 SHEET 2 OF 8

1900031 AD

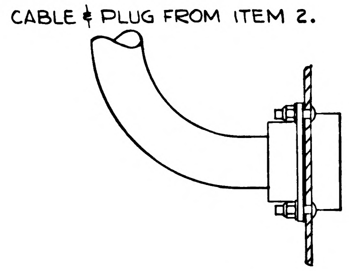
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271/1DM 02580		30 JUL 63	C.A.M.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	
H		CHANGE IN ACCORDANCE WITH MXC 190242		20 SEP 63	
R	—	CHANGE IN ACCORDANCE WITH CM-193683 REVISE PER TDRR C747C		28-JAN-64	J.B.
AD		CHANGE IN ACCORDANCE WITH CM 197061 1155		24 JUN 64	


41 31 48 5 EACH REQD

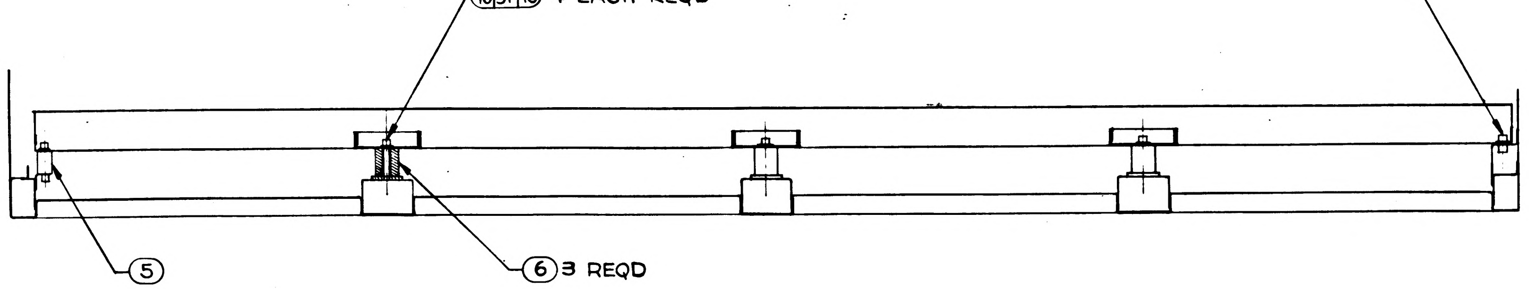
PARTIAL SECTION N-N
SCALE 1/4


N
N
2
P
P
E80 AD
E1
AD
J2
58
53 54 55 16 EACH REQD
SEE DETAIL C
J3
57
J1
59
J4
58
J16
56
J22
57
J23
53 54 55 44 EACH REQD
SEE DETAIL C
57
J17
56
J24
57
J18
56
J25
57
J19
58
J26
57
J20
65
J21
57
53 54 55 24
EACH REQ'D
SEE DETAIL C
57
J10
57
J5
56
J11
58
J6
56
J12
75
J7
56
J13
75
J8
75
J14
75
J9
75
J15

PARTIAL SECTION C-C SEE NOTES 7 & 8


CABLE & PLUG FROM ITEM 2.

DETAIL C
INSTALLATION OF J1 THRU J6,
J10 THRU J13 & J16 THRU J26.


40 31 48 4 EACH REQD
41 31 48
5
6 3 REQD

PARTIAL SECTION P-P
SCALE 1/4

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 **DATE** 14 Au, 63

Ⓓ **THIS SHEET ADDED**

NEXT ASSY	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES + - +.02 + - - - -.02 - - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON TEXAS	
USED ON	MATERIAL	DRAWN D. Wergin DATE 14 JUNE 63 CHECKED E. Fleming 17 JULY 63 APPROVAL G. Stoddard 18 Jul 63 APPROVAL C. Gelman 8/14/63	CABINET ASSEMBLY ELECTRICAL EQUIPMENT OPTICS-INERTIAL ANALYZER ASSEMBLY	
APPLICATION	CONTRACT NAS9-497	NASA APPROVAL 8-14-63 MIT APPROVAL	CODE IDENT NO	SIZE E 1900031
			SCALE NOTED	SHEET 5 OF 8

1900031 AD

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'
3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.
4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.
5. $\boxed{C}$ REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PLATES SUPPLIED WITH ITEM 1 BY VENDOR IN ADDITION TO ITEM (73)
6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)
7. CONNECTOR INSTALLATION:
   a. INSTALL J1 THRU J4 INCLUSIVE OF ITEM 2 INTO ITEM 22 AS SHOWN.
   b. INSTALL J16 THRU J26 INCLUSIVE OF ITEM 2 INTO ITEM 49 AS SHOWN.
   c. INSTALL J5 THRU J15 INCLUSIVE OF ITEM 2 INTO ITEM 74 AS SHOWN.
   d. INSTALL GROUND LUGS TO E1 AND E80 AS SHOWN.

~~8. CAUTION: (2) CANNOT BE ASSEMBLED TO (1) WITH PANEL MOUNTING J5 THRU J15 INCLUSIVE, ATTACHED.~~

9. AFTER ASSEMBLY OF (2) TO (1), ATTACH RETRACTOR MOUNTED CABLES, OF (2), TO (12) IN THEIR RESPECTIVE AREAS.
10. ELECTRICAL REQUIREMENTS:
    AFTER INSTALLATION OF (2) & (10) PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
    A. *POWER ISOLATION CHECK*
    WITH 500 VOLTS DC APPLIED READ A MINIMUM OF 100 MEGOHMS FROM THE FOLLOW POINTS P89-A,B,C,E & K N,O,P,R,S,T,U, P45-R, P43-S, & E1 AND BETWEEN EACH OF THESE POINTS.
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
12. MARK CHARACTERS .38 HIGH PER ND1002019 CENTRALIZE AS SHOWN, COLOR BLACK ~~(25 PLACES)~~
13. *ADJUST ITEM (26) SO AS TO SUPPORT UNDER SIDE OF ITEMS (28) & (62).*
14. DISPOSE OF EXCESS DRAWER MOUNTING AND RETRACTOR HARDWARE IN AN APPROVED MANNER.

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A	SHT 3
B-B	SHT 4
C-C	SHT 5
D-D	SHT 2
E-E	SHT 6
F-F	SHT 6
G-G	SHT 6
H-H	SHT 6
J-J	SHT 7
K-K	SHT 7
L-L	SHT 7
M-M	SHT 7
N-N	SHT 5
P-P	SHT 5
R-R	SHT 3
S-S	SHT 3
T-T	SHT 4
U-U	SHT 4
V-V	SHT 4
W-W	SHT 6
X-X	SHT 4
Y-Y	SHT 6
Z-Z	SHT 2
AA-AA	SHT 2

DETAILS:

A	SHT 4
B	SHT 3
C	SHT 5
D	SHT 7

PARTIAL VIEWS:

Q-Q	SHT 2

NOTES (CONTINUED)

15. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267) AND SERIALIZE PER ND1002023.

15. VENDOR ITEM, SEE SOURCE CONTROL DRAWING

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
AD		CHANGE IN ACCORDANCE WITH CM 197061 11395		24 JUN 64	BR
AE		CHANGE IN ACCORDANCE WITH CM 1376-- REVISED PER TDRR 11734	—	64	

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		*REPLACES REVISION "C" WITH CHANGE PER MXC 188271*	TDRR 02580	30 JUL 63	C.A.M. EF
				14 AUG 63	WR
E		CHANGE IN ACCORDANCE WITH MXC 189072		3 SEP 63	AU
-	-	ADDED CUSTOMERS DATA (V 6-63)	—	4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G	-	CHANGE IN ACCORDANCE WITH MXC 189686	—	9 SEP 63	J.J.J. AU
H	-	CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
J	—	CHANGE IN ACCORDANCE WITH MXC 191967	—	6 Nov 63	
K		CHANGE IN ACCORDANCE WITH CM 192872		JAN 64	EM R.D.
L		REVISION STATUS CHANGED PER CM 192872		JAN 64	E.M. R.D.
M		REVISION STATUS CHANGED PER CM 193187		13 JAN 64	E.M.
N		*ITEM 15 WAS 1015918-109 PER CM 193580*		14 JAN 64	E.M.
P	—	CHANGE IN ACCORDANCE WITH CM-193681		24 JAN 64	J.B.
R	—	CHANGE IN ACCORDANCE WITH CM-193683		28 JAN 64	J.B.
S	—	CHANGE IN ACCORDANCE WITH CM-194362		28 JAN 64	J.B.
T	—	CHANGE IN ACCORDANCE WITH CM-194739 *REVISE PER TDRR 07470*		3 FEB 64 4-7-64	
U		CHANGE IN ACCORDANCE WITH CM 195566 ADDED CUSTOMER DATA (V2-64) TDRR 10721		22 APR 64	J.C. CP
V		CHANGE IN ACCORDANCE WITH CM 195662 TDRR 10722		11 MAY 64	
W	E-3	CHANGE IN ACCORDANCE WITH CM 195957 TDRR 10723		28 MAY 64	BK CP
Y	A-8	CHANGE IN ACCORDANCE WITH CM 196077 TDRR 10724		2 JUN 64	EF
Z		CHANGE IN ACCORDANCE WITH CM 196261 TDRR 10725		10 JUN 64	RB.
AA		CHANGE IN ACCORDANCE WITH CM 196320 TDRR 10725		JUN 64	BK
AB		CHANGE IN ACCORDANCE WITH CM 196322 TDRR 10726		18 JUN 64	JJJ EF
AC		CHANGE IN ACCORDANCE WITH CM 196488 TDRR 10727	—	19 JUN 64	JJJ MEM

(D) REPLACES REV (C) WITH CHANGE

SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8
AE	AE	T	U	AD	AC	AC	L
AD	AD	T	U	AD	AC	AC	L
AC	Y	T	U	R	AC	AC	L
AB	Y	T	U	R	Z	P	L
AA	Y	T	U	R	Z	P	L
Z	Y	T	U	R	Z	P	L
Y	Y	T	U	R	L	P	L
W	W	T	U	R	L	P	L
V	R	T	U	R	L	P	L
U	R	T	U	R	L	P	L
S	R	L	S	R	L	P	L
R	R	L	P	R	L	P	L
P	M	L	P	H	L	P	L
N	M	L	L	H	L	L	L
M	M	L	L	H	L	L	L
L	L	L	L	H	L	L	L
K	H	D	H	H	K	K	K
J	H	D	H	H	D	E	E
H	H	D	H	H	D	E	E
G	G	D	E	E	D	E	E
F	F	D	E	E	D	E	E
E	E	D	E	E	D	E	E
D	D	D	D	D	D	D	D

REVISION STATUS OF SHEETS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 **DATE** 14 Aug 63

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		80	1901687	PLATE, INSTRUCTION
	1		79	1901657	INSULATOR BUSHING
	1		78	1901656	INSULATOR PAD
	~~1~~		~~77~~	~~1015790-002~~	~~NUT BAR~~
NOTE 11	2		76	1015800-001	CABLE RETRACTOR
	5		75	1900369	GASKET - CONNECTOR
	1		74	1900365	PANEL ASS'Y (INSEP)
NOTE 5, 15	17		73	1901346	PLATE, CLOSURE
NOTE 11	21		72	1006783-29	SCREW-BUTTON-HEX. SOC.
	43		71	AN363C832 (1896990-281)	NUT, SELF LOCKING
	12		70	MS-35234-60	SCREW, PAN HEAD
	2		69	1900973	DEFLECTOR, AIR
	37		68	AN960C8L (1897006-038)	WASHER, FLAT
NOTE 11	37		67	1006783-27	SCREW-BUTTON-HEX SOC
	36		66	MS35338-80	WASHER-LOCK
	1		65	1900368-009	GASKET-CONNECTOR
	1		64	1900569	STORAGE DRAWER ASSY
	1		63	1900568	STORAGE DRAWER ASSY
	2		62	1900345-021	WRITING SURFACE ASSY
	1		61	1900550	GROUND PLATE
	~~2~~		~~60~~	~~1900369~~	~~GASKET-CONNECTOR~~
	1		59	1900368-001	GASKET-CONNECTOR
	4		58	1900368-003	GASKET-CONNECTOR
	9		57	1900368-004	GASKET-CONNECTOR
	6		56	1900368-005	GASKET-CONNECTOR
	84		55	AN363C632 (1896990-261)	NUT, SELF LOCKING
	84		54	AN960C6L (1897006-036)	WASHER, FLAT #6
NOTE 11	84		53	1006783-23	SCREW-BUTTON-HEX. SOC.
			52		
			51		

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	55		50	MS21919WDG-2 THRU -15 (1897073-202 THRU -215	CLAMP, LOOP TYPE
	1		49	1900379	PANEL (INSEP) ASSY
	13		48	AN960C616 (1897006-062)	WASHER, FLAT
(W)	1		47	1900309-011	*PANEL ASSY, CROSSBAR SWITCH COMP*
			46		
			45		
	2		44	1900364-031	BLANK PANEL ASSY 7
	1		43	1900364-021	BLANK PANEL ASSY 5 1/4
	3		42	MS171492	PIN
	6		41	MS16995-79	SCREW, SOC HD CAP
	4		40	MS16995-86	SCREW, SOC HD CAP
	8		39	AN363C1032 (1896990-011)	NUT, SELF LOCKING
	5		38	AN335-6	NUT-HEX
NOTE 11	30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
↑	4		36	-46	↑
	55		35	-45	
↓	72		34	-44	↓
NOTE 11	13		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
	30		32	MS35338-79	WASHER-LOCK #6
	13		31	MS35338-84	WASHER-LOCK 3/8
	118		30	AN960C10L (1897006-019)	WASHER, FLAT #10
	140		29	MS-35338-81	WASHER-LOCK #10
	~~1~~		~~28~~	~~1900345-011~~	~~WRITING SURFACE ASSY~~
	4		27	1900344	NUT BAR
	4		26	1900343	BRACKET
NOTE 11	4		25	1015790-001	NUT BAR
	2		24	1900277	BRACKET
~~NOTE 11~~	~~2~~		~~23~~	~~1015800~~	~~CABLE RETRACTOR~~
	1		22	1900380	PANEL (INSEP) ASSY
	1		21	1900255-011	LATCH ASSY
	2		20	1900080	STUD-GROUND
NOTE 11	7		19	1015918-102	TERMINAL BLOCK ASSY
↑	1		18	-103	↑
	1		17	-104	
	1		16	-108	
	1		15	-118	
↓	3		14	-110	↓
	1		13	1015918-112	TERMINAL BLOCK ASSY
	29		12	1015991-001	SCREW, HANGER
NOTE 11	4		11	1015819-001	AIR FILTER ASSY, SPECIAL
	1		10	1900175	WIRING HARNESS 'A'
	4		9	1900308	GUIDE
	2		8	1900303	SUPPORT BRACKET R.H.
	2		7	1900304	SUPPORT BRACKET L.H.
	3		6	1900307	SPACER
	1		5	1900198	SPACER
	1		4	1900306	BAR-STOP
	1		3	1900305	SUPPORT SHEET
	1		2	1900064	HARNESS FRAME ASSY
NOTE 11	1		1	1900007	CABINET ASSY, BASIC

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO
1900004-011	1900004-0	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ –
– —	–.02	– –

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE WISCONSIN
ACSP PN

DRAWN P.T. Werning DATE 14 June 63
CHECKED E. Fleming 17 MAY 63
APPROVAL G. Stepanek
APPROVAL
F-14-63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

CABINET ASSEMBLY -
ELECTRICAL EQUIPMENT
OPTICS - INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE NOTED
SHEET 1 OF 8

1900031 AE

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271 TDRR 02580	14 AUG	30 JUL 63	C.A.M.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	AU
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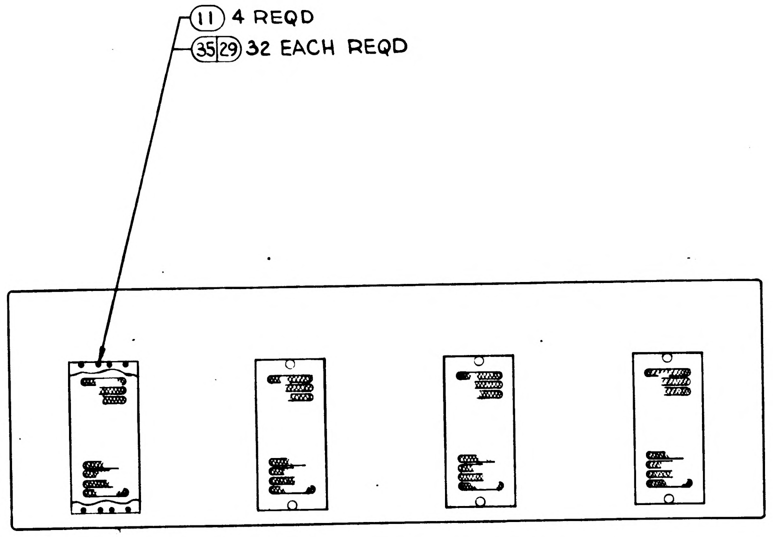
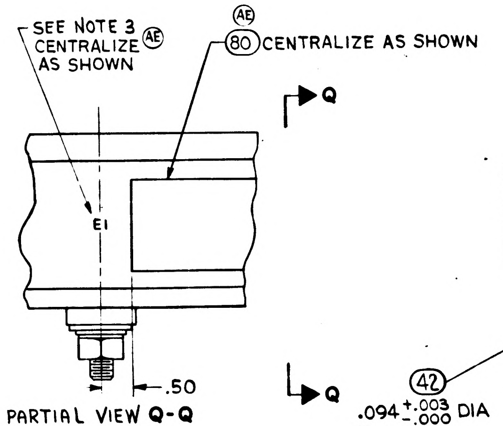
G		CHANGE IN ACCORDANCE WITH MXC 189686		9 SEP 63	J.J.J. a.u.
H		CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
L		CHANGE IN ACCORDANCE WITH CM 192872		10 JAN 64	E M R.D.
M	F8	ITEM 62 (1)1900345-021 WAS ITEM 28 (1)1900345-011 PER CM 193187		13 JAN 64	EM
R	—	CHANGE IN ACCORDANCE WITH CM-193683 REVISE PER TDRR 07410		28-JAN-64 4-7-64	J.B. WK
W	D-7	CHANGE IN ACCORDANCE WITH CM 195957 TDRR 10723		28 MAY 64	BK CP
Y	G-5	CHANGE IN ACCORDANCE WITH CM 196077 TDRR 10724		2 JUN 64	FL
AD		CHANGE IN ACCORDANCE WITH CM 197061 395		24 JUN 64	BK
AE	H-5	CHANGE IN ACCORDANCE WITH CM 197640 TDRR 734		16 JUL 64	JJJ

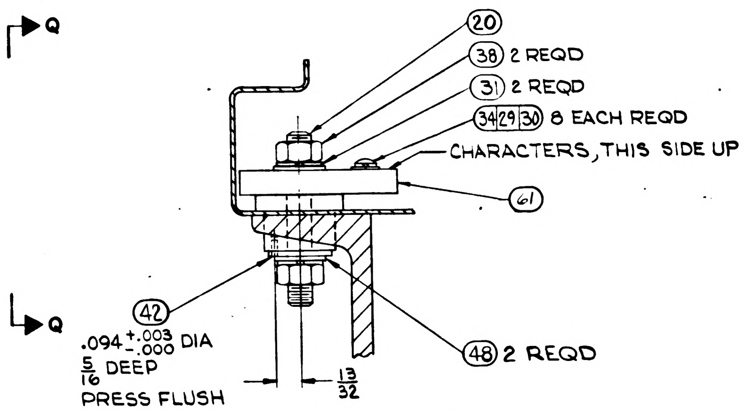


(11) 4 REQD
(35)(29)(32) EACH REQD



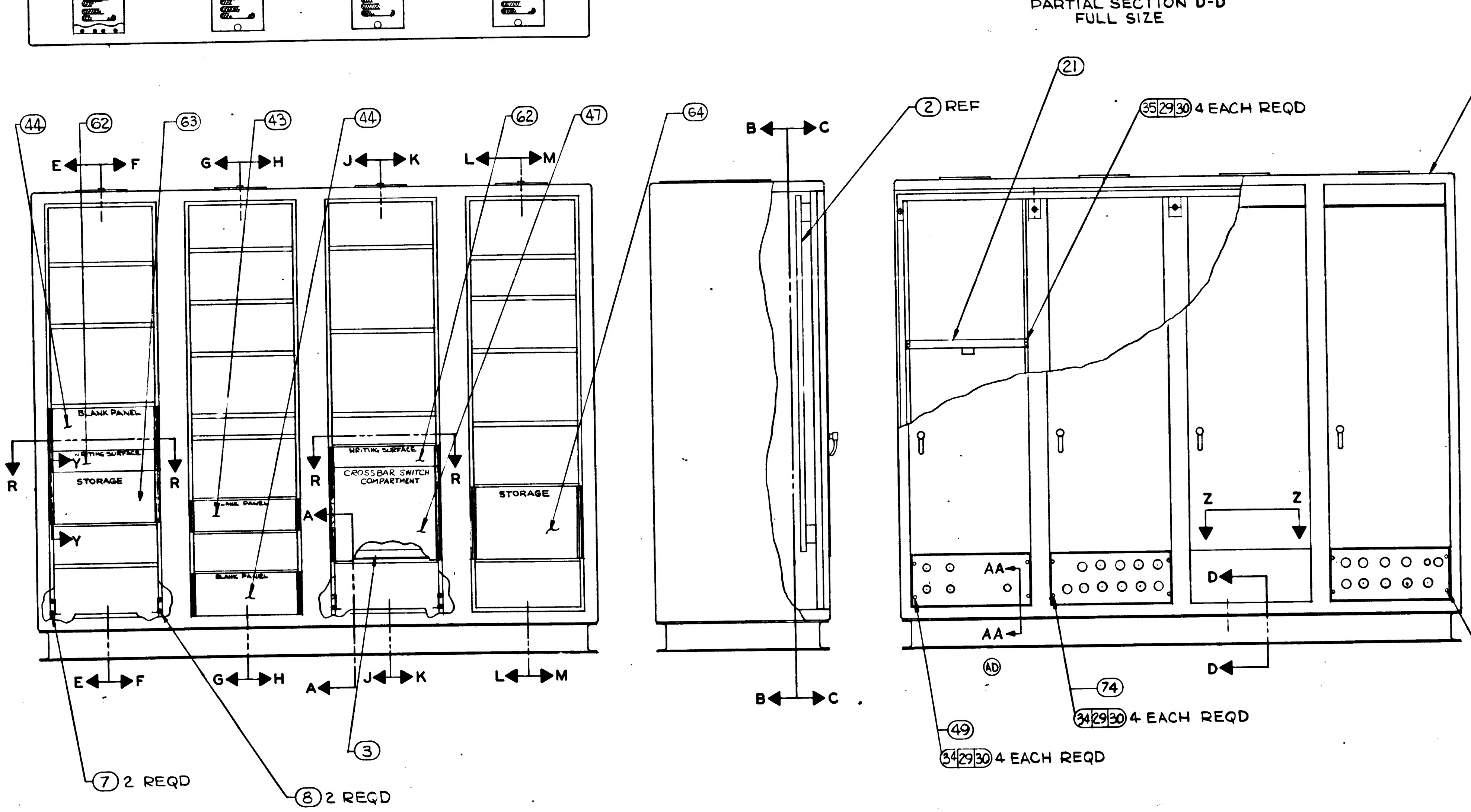
SEE NOTE 3
CENTRALIZE (AE)
AS SHOWN
(AE)
(80) CENTRALIZE AS SHOWN
Q
Q
E1
.50

PARTIAL VIEW Q-Q

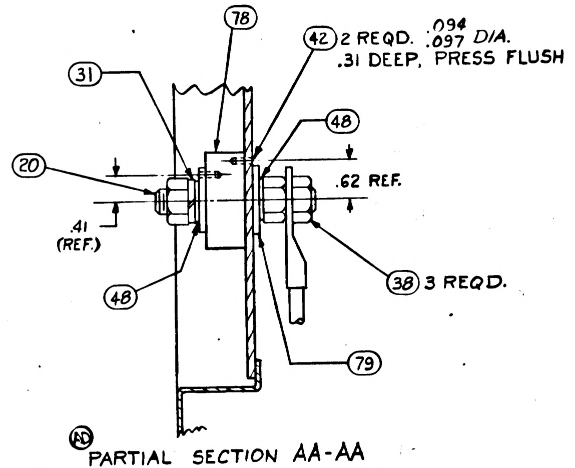


(20)
(38) 2 REQD
(31) 2 REQD
(34)(29)(30) 8 EACH REQD
CHARACTERS, THIS SIDE UP
(61)
(42)
.094 +.003 -.000 DIA
5/16 DEEP
PRESS FLUSH
13/32
(48) 2 REQD

PARTIAL SECTION D-D
FULL SIZE

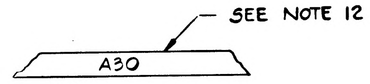


(1)
(21)
(2) REF
(35)(29)(30) 4 EACH REQD
(44)
(62)
(63)
(43)
(44)
(62)
(47)
(64)
E F
G H
J K
L M
B C
BLANK PANEL
WRITING SURFACE
STORAGE
R
R
Y
Y
BLANK PANEL
BLANK PANEL
WRITING SURFACE
CROSSBAR SWITCH COMPARTMENT
A
STORAGE
Z
Z
AA
AA
D
D
(AD)
E F
G H
A J K
L M
B C
(22)
(34)(29)(30) 4 EACH REQD
(74)
(34)(29)(30) 4 EACH REQD
(49)
(34)(29)(30) 4 EACH REQD
(3)
(7) 2 REQD
(8) 2 REQD



(78)
(42) 2 REQD. .094 .097 DIA.
.31 DEEP, PRESS FLUSH
(31)
(48)
(20)
.62 REF.
.41 (REF.)
(48)
(38) 3 REQD.
(79)

(AD) PARTIAL SECTION AA-AA
FULL SIZE



SEE NOTE 12
A30

PARTIAL VIEW Z-Z

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 02580 **DATE** 14 Aug 63

(D) **THIS SHEET ADDED**

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +— —— DECIMALS +.02 -.02 ANGLES +— —— DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN T. Wagins DATE 14 JUNE 63 CHECKED E. Fleming 7 JULY 63 APPROVAL G. Stoddard 19 Jul 63 APPROVAL 7/19/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS INERTIAL ANALYZER ASSEMBLY
APPLICATION		MATERIAL CONTRACT NAS9-497	NASA APPROVAL 8-14-63 MIT APPROVAL 14 Aug 63	CODE IDENT NO SIZE E 1900031 SCALE NOTED SHEET 2 OF 8

AE 1900031 B

1900031

SH 2 1900031

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
AD		CHANGE IN ACCORDANCE WITH CM 197061		24 JUN 64	BK
AE		CHANGE IN ACCORDANCE WITH CM 1976-0 REVISED PER TDRR 11734	—	64	
AF		CHANGE IN ACCORDANCE WITH CM 199907 TDRR 13084	—	2 SEP 64	RJF / PJ

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		REPLACES REVISION "C" WITH CHANGE PER MXC 188871	TDRR 02580	30 JUL 63 14 AUG 63	C.A.M. / EF WR
E		CHANGE IN ACCORDANCE WITH MXC 189072		3 SEP 63	J.A. / AU
-	-	ADDED CUSTOMERS DATA (V 6-63)	—	4 SEP 63	J.A. / AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	J.A. / AU
G	-	CHANGE IN ACCORDANCE WITH MXC 189686	—	9 SEP 63	J.J. / AU
H	-	CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	J.A.
J	-	CHANGE IN ACCORDANCE WITH MXC 191867	—	6 NOV 63	WBM
K		CHANGE IN ACCORDANCE WITH CM 92872		JAN 64	EM / R.D.
L		REVISION STATUS CHANGED PER CM 92872		JAN 64	EM / R.D.
M		REVISION STATUS CHANGED PER CM 193187		9 JAN 64	EM / EF
N		ITEM 15 WAS 1015918-109 PER CM 193580		14 JAN 64	EM / EF
P	—	CHANGE IN ACCORDANCE WITH CM-193681		24 JAN 64	J.B. / PJ
R	—	CHANGE IN ACCORDANCE WITH CM-193683		28 JAN 64	J.B. / PJ
S	—	CHANGE IN ACCORDANCE WITH CM-194362		28 JAN 64	J.B. / PJ
T	—	CHANGE IN ACCORDANCE WITH CM-194739 REVISE PER TDRR C7470		3 FEB 64 4-7-64	PJ
U		CHANGE IN ACCORDANCE WITH CM 195566 ADDED CUSTOMER ~~DATA~~ (V2-64) TDRR 10721		22 APR 64	J.C. / CP
V		CHANGE IN ACCORDANCE WITH CM 195662 TDRR 10722		11 MAY 64	J / PJ
W	E-5	CHANGE IN ACCORDANCE WITH CM 195957 TDRR 10723		28 MAY 64	BK / CP
Y	A-8	CHANGE IN ACCORDANCE WITH CM 196077 TDRR 10724		2 JUN 64	FL / EF
Z		CHANGE IN ACCORDANCE WITH CM 196261 TDRR 10725		JUN 64	RR / RWH
AA		CHANGE IN ACCORDANCE WITH CM 96320 TDRR 10725		JUN 64	BK / RWH
AB		CHANGE IN ACCORDANCE WITH CM 28322 TDRR 10726		18 JUN 64	JJJ / EF
AC		CHANGE IN ACCORDANCE WITH CM 26488 TDRR 10727	—	JUN 64	JJJ / MEM

Ⓓ REPLACES REV (C) WITH CHANGE

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'
3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.
4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.
5. $\boxed{C}$ REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PLATES SUPPLIED WITH ITEM 1 BY VENDOR IN ADDITION TO ITEM (73)
6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)

~~7. CONNECTOR INSTALLATION:~~
~~a. INSTALL J1 THRU J4 INCLUSIVE OF ITEM 2 INTO ITEM 22 AS SHOWN.~~
~~b. INSTALL J16 THRU J26 INCLUSIVE OF ITEM 2 INTO ITEM 49 AS SHOWN.~~
~~c. INSTALL J5 THRU J15 INCLUSIVE OF ITEM 2 INTO ITEM 74 AS SHOWN.~~
~~d. INSTALL GROUND LUGS TO E1 AND E80 AS SHOWN.~~

~~8. CAUTION: (2) CANNOT BE ASSEMBLED TO (1) WITH PANEL MOUNTING J5 THRU J15 INCLUSIVE, ATTACHED.~~

9. AFTER ASSEMBLY OF HARNESS FRAME TO IT. (1) ATTACH RETRACTOR MOUNTED CABLES TO ITEM (12) IN THEIR RESPECTIVE AREAS.
10. ELECTRICAL REQUIREMENTS:
    AFTER INSTALLATION OF (2) OR (81) & (10) PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
    A. *POWER ISOLATION CHECK*
    WITH 500 VOLTS DC APPLIED READ A MINIMUM OF 100 MEGOHMS FROM THE FOLLOW POINTS P89-A,B,C,E & K N,O,P,R,S,T,U, P45-R, P43-S, AND E1 AND BETWEEN EACH OF THESE POINTS.
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
12. MARK CHARACTERS .38 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK ~~(25 PLACES)~~
13. *ADJUST ITEM (26) SO AS TO SUPPORT UNDER SIDE OF ITEMS (28) & (62).*
14. DISPOSE OF EXCESS DRAWER MOUNTING AND RETRACTOR HARDWARE IN AN APPROVED MANNER.

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A	SHT	3
B-B	SHT	4
C-C	SHT	5
D-D	SHT	2
E-E	SHT	6
F-F	SHT	6
G-G	SHT	6
H-H	SHT	6
J-J	SHT	7
K-K	SHT	7
L-L	SHT	7
M-M	SHT	7
N-N	SHT	5
P-P	SHT	5
R-R	SHT	3
S-S	SHT	3
T-T	SHT	4
U-U	SHT	4
V-V	SHT	4
W-W	SHT	6
X-X	SHT	4
Y-Y	SHT	6
Z-Z	SHT	2
AA-AA	SHT	2

DETAILS:

A	SHT	4
B	SHT	3
C	SHT	5
D	SHT	7

PARTIAL VIEWS:

Q-Q	SHT	2

NOTES (CONTINUED)

15. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267) AND SERIALIZE PER ND1002023.
15. VENDOR ITEM, SEE SOURCE CONTROL DRAWING.

SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8
AF	AF	T	U	AF	AC	AC	L
AE	AE	T	U	AD	AC	AC	L
AD	AD	T	U	AD	AC	AC	L
AC	Y	T	U	R	AC	AC	L
AB	Y	T	U	R	Z	P	L
AA	Y	T	U	R	Z	P	L
Z	Y	T	U	R	Z	P	L
Y	Y	T	U	R	L	P	L
W	W	T	U	R	L	P	L
V	R	T	U	R	L	P	L
U	R	T	U	R	L	P	L
S	R	L	S	R	L	P	L
R	R	L	P	R	L	P	L
P	M	L	P	H	L	P	L
N	M	L	L	H	L	L	L
M	M	L	L	H	L	L	L
L	L	L	L	H	L	L	L
K	H	D	H	H	K	K	K
J	H	D	H	H	D	E	E
H	H	D	H	H	D	E	E
G	G	D	E	E	D	E	E
F	F	D	E	E	D	E	E
E	E	D	E	E	D	E	E
D	D	D	D	D	D	D	D

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0258D DATE 14 Aug 63

			QUANTITY REQUIRED 021	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			81	1900064-021	HARNESS FRAME ASSY
			1	1		80	1901687	PLATE, INSTRUCTION
			1	1		79	1901657	INSULATOR BUSHING
			1	1		78	1901656	INSULATOR PAD
				~~1~~		~~77~~	~~1015790-002~~	~~NUT BAR~~
NOTE 11			2	2		76	1015800-001	IBLE RETRACTOR
			5	5		75	1900369	ASKET - CONNECTOR
			1	1		74	1900365	PANEL ASS'Y (INSEP)
NOTE-5, 15			17	17		73	1901346	PLATE, CLOSURE
NOTE 11			21	21		72	1006783-29	SCREW-BUTTON-HEX. SOC.
			43	43		71	AN363C832 (1896990-281)	NUT, SELF LOCKING
			12	12		70	MS-35234-60	SCREW, PAN HEAD
			2	2		69	1900973	DEFLECTOR, AIR
			37	37		68	AN960C8L (1897006-038)	WASHER, FLAT
NOTE 11			37	37		67	1006783-27	SCREW-BUTTON-HEX SOC
			36	36		66	MS35338-80	WASHER-LOCK
			1	1		65	1900368-009	GASKET-CONNECTOR
			1	1		64	1900569	STORAGE DRAWER ASSY
			1	1		63	1900568	STORAGE DRAWER ASSY
			2	2		62	1900345-021	WRITING SURFACE ASSY
			1	1		61	1900550	GROUND PLATE
				~~2~~		~~60~~	~~1900369~~	~~GASKET-CONNECTOR~~
			1	1		59	1900368-001	GASKET-CONNECTOR
			4	4		58	1900368-003	GASKET-CONNECTOR
			9	9		57	1900368-004	GASKET-CONNECTOR
			6	6		56	1900368-005	GASKET-CONNECTOR
			84	84		55	AN363C632 (1896990-261)	NUT, SELF LOCKING
			84	84		54	AN960C6L (1897006-036)	WASHER, FLAT #6
NOTE 11			84	84		53	1006783-23	SCREW-BUTTON-HEX. SOC.
						52		
						51		
						50	MS21919WDG-2 THRU -15 1897073-202 THRU -215	CLAMP, LOOP TYPE
			55	55		50	MS21919WDG-2 THRU -15 1897073-202 THRU -215	CLAMP, LOOP TYPE
			1	1		49	1900379	PANEL (INSEP) ASSY
			13	13		48	AN960C616 (1897006-062)	WASHER, FLAT
(W)			1	1		47	1900309-011	*PANEL ASSY, CROSSBAR SWITCH COMP*
						46		
						45		
			2	2		44	1900364-031	BLANK PANEL ASSY 7
			1	1		43	1900364-021	BLANK PANEL ASSY 5¼
			3	3		42	MS171492	PIN
			6	6		41	MS16995-79	SCREW, SOC HD CAP
			4	4		40	MS16995-86	SCREW, SOC HD CAP
			8	8		39	AN363C1032 (1896990-011)	NUT, SELF LOCKING
			5	5		38	AN335-6	NUT-HEX
NOTE 11			30	30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
			4	4		36	-46	
			55	55		35	-45	
			72	72		34	-44	
NOTE 11			13	13		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
			30	30		32	MS35338-79	WASHER-LOCK #6
			13	13		31	MS35338-84	WASHER-LOCK 3/8
			118	118		30	AN960C10L (1897006-019)	WASHER, FLAT #10
			140	140		29	MS-35338-81	WASHER-LOCK #10
				~~1~~		~~28~~	~~1900345-011~~	~~WRITING SURFACE ASSY~~
			4	4		27	1900344	NUT BAR
			4	4		26	1900343	BRACKET
NOTE 11			4	4		25	1015790-001	NUT BAR
			2	2		24	1900277	BRACKET
~~NOTE 11~~				~~2~~		~~23~~	~~1015800~~	~~CABLE RETRACTOR~~
			1	1		22	1900380	PANEL (INSEP) ASSY
			1	1		21	1900255-011	LATCH ASSY
			2	2		20	1900080	STUD-GROUND
NOTE 11			7	7		19	1015918-102	TERMINAL BLOCK ASSY
			1	1		18	-103	
			1	1		17	-104	
			1	1		16	-108	
			1	1		15	-118	
			3	3		14	-110	
			1	1		13	1015918-112	TERMINAL BLOCK ASSY
			29	29		12	1015991-001	SCREW, HANGER
NOTE 11			4	4		11	1015819-001	AIR FILTER ASSY, SPECIAL
			1	1		10	1900175	WIRING HARNESS 'A'
			4	4		9	1900308	GUIDE
			2	2		8	1900303	SUPPORT BRACKET R.H
			2	2		7	1900304	SUPPORT BRACKET L.H.
			3	3		6	1900307	SPACER
			1	1		5	1900198	SPACER
			1	1		4	1900306	BAR-STOP
			1	1		3	1900305	SUPPORT SHEET
				1		2	1900064-011	HARNESS FRAME ASSY
NOTE 11			1	1		1	1900007	CABINET ASSY, BASIC

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-021	1900004-021	021
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ -
- —	-.02	- -

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P. T. Wering DATE 14 June 63
CHECKED E. Fleming 17 July 63
APPROVAL
APPROVAL
7-14-63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

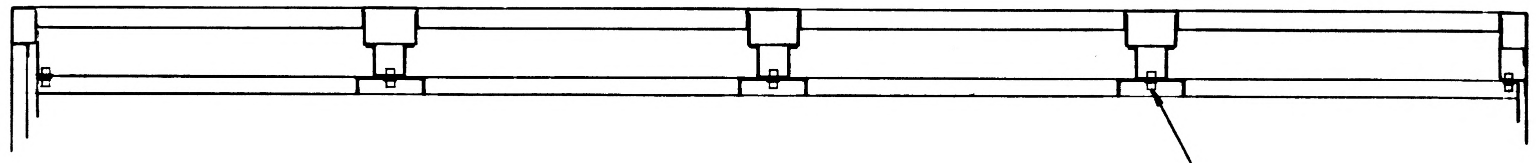
CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS - INERTIAL ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE NOTED
SHEET 1 OF 8

1900031 AF

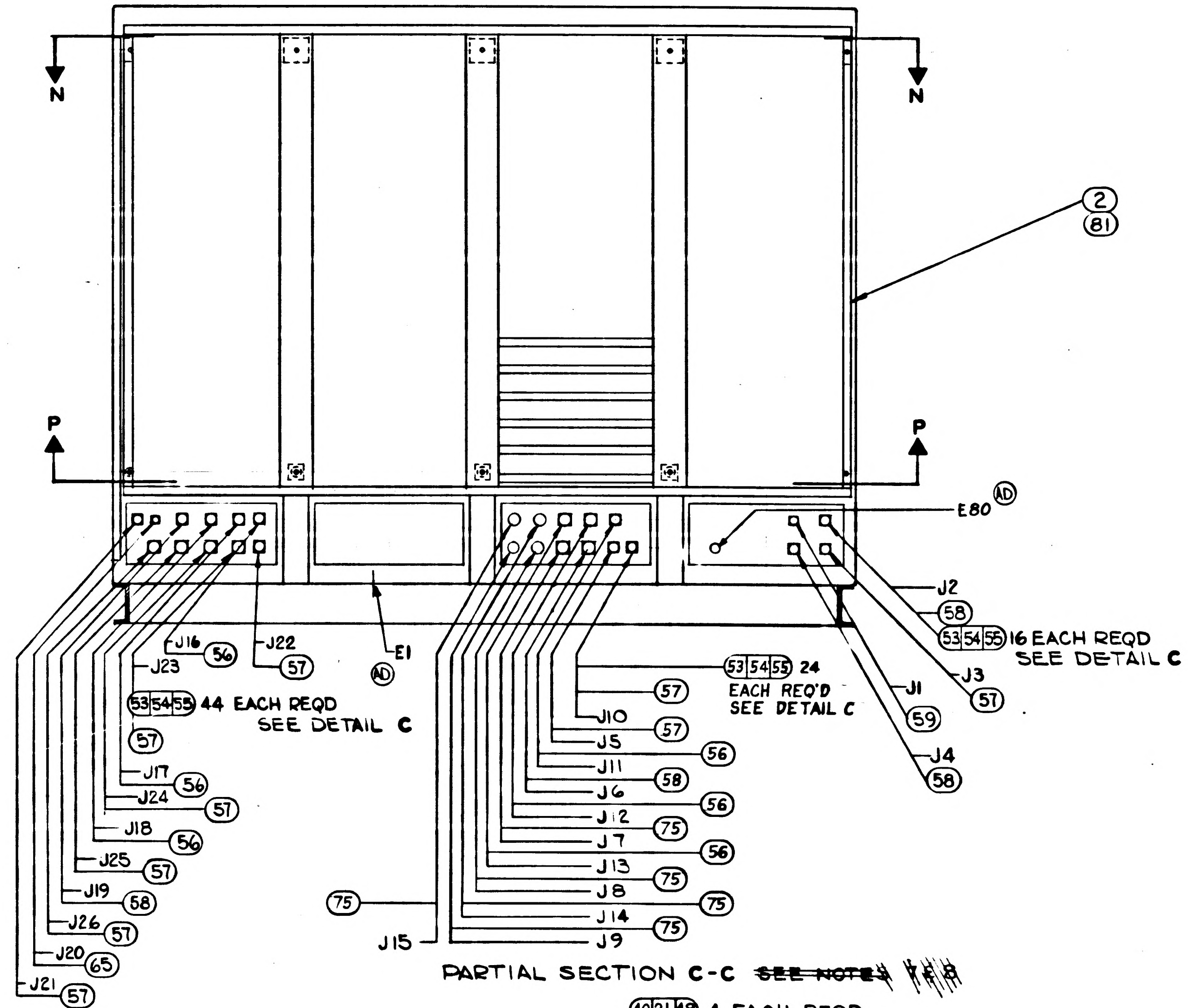
MIL 1077E-P

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
Ⓓ D		THIS SHEET ADDED PER MXC 188271 TDR 02580		30 JUL 63	C.A.M.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	
H		CHANGE IN ACCORDANCE WITH MXC 190242		20 SEP 63	
Ⓜ R	—	CHANGE IN ACCORDANCE WITH CM-193683 REVISE PER TDRR C747C		28-JAN-64	J.B.
AD		CHANGE IN ACCORDANCE WITH CM 197061 TDRR 395		24 JUN 64	BK.
AF		CHANGE IN ACCORDANCE WITH CM 199907 TDRR 13C84		2 SEP 64	RJF



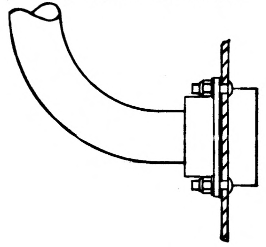
41 31 48 5 EACH REQD

PARTIAL SECTION N-N
SCALE 1/4



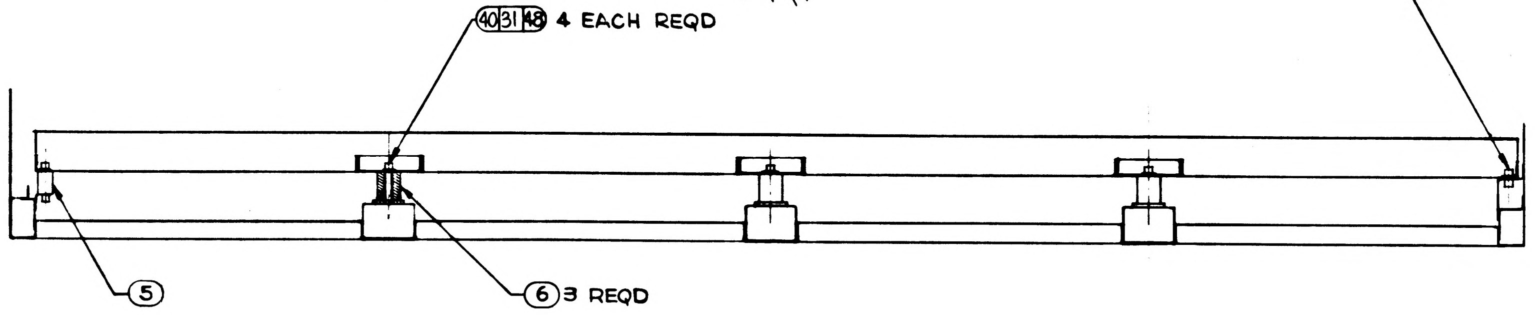
N
N
P
P
2
81
E80 AD
E1 AD
J2
58
53 54 55 16 EACH REQD SEE DETAIL C
J3
57
J1
59
J4
58
J16 56
J22
57
J23
53 54 55 44 EACH REQD SEE DETAIL C
57
J17 56
J24 57
J18 56
J25 57
J19 58
J26 57
J20 65
J21 57
53 54 55 24 EACH REQ'D SEE DETAIL C
57
J10 57
J5 56
J11 58
J6 56
J12 75
J7 56
J13 75
J8 75
J14 75
J9
75
J15

PARTIAL SECTION C-C ~~SEE NOTES 7 & 8~~



CABLE & PLUG FROM ITEM 2.

DETAIL C
INSTALLATION OF J1 THRU J6, J10 THRU J13 & J16 THRU J26.



40 31 48 4 EACH REQD
41 31 48
5
6 3 REQD

PARTIAL SECTION P-P
SCALE 1/4

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 DATE Aug 63

Ⓓ THIS SHEET ADDED

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± —, DECIMALS ±.02, ANGLES ± — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN
APPLICATION		MATERIAL	DRAWN D. Wagner DATE 12 JUNE 63 CHECKED E. Fleming 17 JULY 63 APPROVAL APPROVAL NASA APPROVAL 8-14-63 MIT APPROVAL Aug 63
		CONTRACT NAS9-497	

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS-INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO. SIZE E 1900031
SCALE NOTED SHEET 5 OF 8

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A1		Ⓐ REVISED	D.O. 51442	10-APR-63	A. J. F. Lime

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

▷1 VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				100			AN960C10	WASHER, PLAIN
				200			MS16996-10	SCREW CAP, HEX. SOCKET HEAD
				416			MS35338-81	WASHER, SPRING TENSION
				216			1006783-44	SCREW, BUTTON HEAD, HEX. SOCKET
▷1				4			1015819-001	PANEL ASSEMBLY, FILTER
▷1				2			1015824	FAN ASSEMBLY, CENTRIFUGAL
				1			1900064	HARNESS & FRAME ASSEMBLY
▷1				1			1900007	CABINET ASSEMBLY, BASIC
				011				

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4-3-63
MALIKOWSKI 4 APR 63
CHECKED
APPROVAL W. PIERCE 4-4-63
APPROVAL A. Rudel 4 APR 63
NASA APPROVAL B. Mitchell 4/24/63
J. P. Gilmore 4-24-63
MIT APPROVAL W. Coyle 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY,
ELECTRICAL EQUIPMENT
OPTICS-INERTIAL ANALYZER
ASSEMBLY

CODE IDENT NO.
SIZE C
1900031
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

Ⓜ

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		Ⓐ₁ REVISED	D.O. 51442	10-APR-63	A.J.F.
A1		ADDED 1 REQD-1900075. CHANGED AN960C10 FROM 100 REQD. TO 200 REQD.	MXC 186152	1 MAY 63	JHR P.F.
A2		CHANGED IN ACCORDANCE WITH MXC 187250	MXC 187250	19 JUL 63	C.A.M. W.D.
A3		CHANGED IN ACCORDANCE WITH MXC 187252	MXC 187252	19 JUL 63	C.A.M. W.D.
B		CHANGE IN ACCORDANCE WITH MXC 188189	MXC 188189	30 JUL 63	C.A.M. EF
C		REPLACED WITH CHANGE BY REVISION "D"	MXC 188271	30 JUL 63	C.A.M. EF

FOR INFORMATION ONLY TDRR 02582 WK 14 Aug 63

CLASS B RELEASE TDR No. 00999 **DATE** 24 APR 63

Ⓒ **REPLACED WITH CHANGE BY REV D**

PICTURE INCOMPLETE

▷1 VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1			1900175	WIRING HARNESS "A"
				10			MS21919DG10	
				10			MS21919DG8	
				10			MS21919DG6	
				10			MS21919DG4	CLAMP, CUSHIONED SUPPORT
				40			1006783-44	SCREW, BUTTON HEAD
				40			AN363C1032	NUT, SELF LOCKING
				30			MS-35338-79	LOCKWASHER
				30			1006783-2	SCREW, BUTTON HEAD
				1			-112	
				3			-110	
				1			-109	
				1			-108	
				1			-104	
				1			1015918-103	TERMINAL BLOCK
				200			AN960C10	WASHER, PLAIN
				200			MS16996-10	SCREW CAP, HEX. SOCKET HEAD
				416			MS35338-81	WASHER, SPRING TENSION
				216			1006783-44	SCREW, BUTTON HEAD, HEX. SOCKET
▷1				4			1015819-001	PANEL ASSEMBLY, FILTER
				7			1015918-102	TERMINAL BLOCK
				1			1900064	HARNESS & FRAME ASSEMBLY
▷1				1			1900007	CABINET ASSEMBLY, BASIC

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4-3-63
MALIKOWSKI 4 APR 63
CHECKED
APPROVAL W. PIERCE 4-4-63
APPROVAL 4 APR 63
NASA APPROVAL 4/24/63
J.P. Gilmore 4-24-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY,
ELECTRICAL EQUIPMENT
OPTICS-INERTIAL ANALYZER
ASSEMBLY

CODE IDENT NO. | SIZE C | 1900031

SCALE —— | SHEET

MIL 1078C-P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		REPLACES REVISION "C" WITH CHANGE PER MXC 188271	0258D	30 JUL 63	C.A.N. / C.F. W.C.

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'
3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.
4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.
5. C REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PANELS SUPPLIED WITH ITEM 1 BY VENDOR.
6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)
7. CONNECTOR INSTALLATION:
   INSTALL J14 THRU J17 INCLUSIVE OF ② INTO ㉒ AS SHOWN.
   INSTALL J18 THRU J23 INCLUSIVE OF ② INTO (49) AS SHOWN.
8. CAUTION: ② CANNOT BE ASSEMBLED TO ① WITH PANEL MOUNTING J1 THRU J8 INCLUSIVE AND J10 THRU J13 INCLUSIVE, ATTACHED.
9. AFTER ASSEMBLY OF ② TO ①, ATTACH RETRACTOR MOUNTED CABLES, OF ②, TO ⑫ IN THEIR RESPECTIVE AREAS.
10. ELECTRICAL REQUIREMENTS:
    AFTER INSTALLATION OF ② & ⑩ PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
    A. CONTINUITY TEST - MEASURE ZERO $^{+1}_{-0}$ OHMS BETWEEN TERMINAL POINTS OF EACH CONDUCTOR.
    B. INSULATION RESISTANCE - WITH 500 $^{+0}_{-50}$ VDC APPLIED, READ A MINIMUM OF 200 MEG OHMS FROM CONDUCTOR TO GROUND AND FROM CONDUCTOR TO CONDUCTORS NOT ELECTRICALLY CONNECTED.

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A	SHT 3
B-B	SHT 4
C-C	SHT 5
D-D	SHT 2
E-E	SHT 6
F-F	SHT 6
G-G	SHT 6
H-H	SHT 6
J-J	SHT 7
K-K	SHT 7
L-L	SHT 7
M-M	SHT 7
N-N	SHT 5
P-P	SHT 5
R-R	SHT 3
S-S	SHT 3
T-T	SHT 4
U-U	SHT 4

DETAILS:

A	SHT 4
B	SHT 3
C	SHT 5

D	D	D	D	D	D	D	D
SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8

REVISION STATUS OF SHEETS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0258D DATE 14 Aug 63

Ⓓ REPLACES REV (C) WITH CHANGE

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		58	1900368-003	GASKET-CONNECTOR
3		57	1900368-004	GASKET-CONNECTOR
6		56	1900368-005	GASKET-CONNECTOR
40		55	AN363C632	NUT-SELF LOCKING
40		54	AN960-C6L	WASHER-FLAT #6
40		53	1006783-27	SCREW-BUTTON-HEX.SOC.
30		52	MS35338-80	WASHER-LOCK #8
30		51	1006783-26	SCREW-BUTTON HD-HEX.SOC.
AR		50	MS21919WDG-2 THRU-40	CLAMP, LOOP TYPE
1		49	1900397	PANEL (INSEP) ASSY
11		48	AN960-C616	WASHER-FLAT
1		47	1900309-011	PANEL ASSY, SWITCH BOX COMP
1		46	1900364-061	BLANK PANEL ASSY 12 1/4
2		45	1900364-041	BLANK PANEL ASSY 8 3/4
1		44	1900364-031	BLANK PANEL ASSY 7
1		43	1900364-021	BLANK PANEL ASSY 5 1/4
1		42	MS171492	PIN
6		41	MS16995-79	SCREW, SOC HD CAP
4		40	MS16995-86	SCREW, SOC HD CAP
8		39	AN363C1032	NUT-SELF LOCKING
2		38	AN335-6	NUT-HEX
30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
4		36	-46	
51		35	-45	
46		34	-44	
28		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
30		32	MS35338-79	WASHER-LOCK #6
12		31	MS35338-84	WASHER-LOCK 3/8
80		30	AN960-C10L	WASHER-FLAT #10
121		29	MS-35338-81	WASHER-LOCK #10
2		28	1900345-011	WRITING SURFACE ASSY
4		27	1900344	NUT BAR
4		26	1900343	BRACKET
6		25	1015790-001	NUT BAR
2		24	1900277	BRACKET
2		23	1015800	CABLE RETRACTOR
1		22	1900380	PANEL (INSEP) ASSY
1		21	1900255-011	LATCH ASSY
1		20	1900080	STUD-GROUND
7		19	1015918-102	TERMINAL BLOCK ASSY
1		18	-103	
1		17	-104	
1		16	-108	
1		15	-109	
3		14	-110	
1		13	1015918-112	TERMINAL BLOCK ASSY
29		12	1015991-001	SCREW, HANGER
4		11	1015819-001	AIR FILTER ASSY, SPECIAL
1		10	1900175	WIRING HARNESS 'A'
4		9	1900308	GUIDE
4		8	1900303	SUPPORT BRACKET R.H
2		7	1900304	SUPPORT BRACKET L.H.
3		6	1900307	SPACER
1		5	1900198	SPACER
1		4	1900306	BAR-STOP
1		3	1900305	SUPPORT SHEET
1		2	1900064	HARNESS FRAME ASSY
1		1	1900007	CABINET ASSY, BASIC

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ -
- —	-.02	- -

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

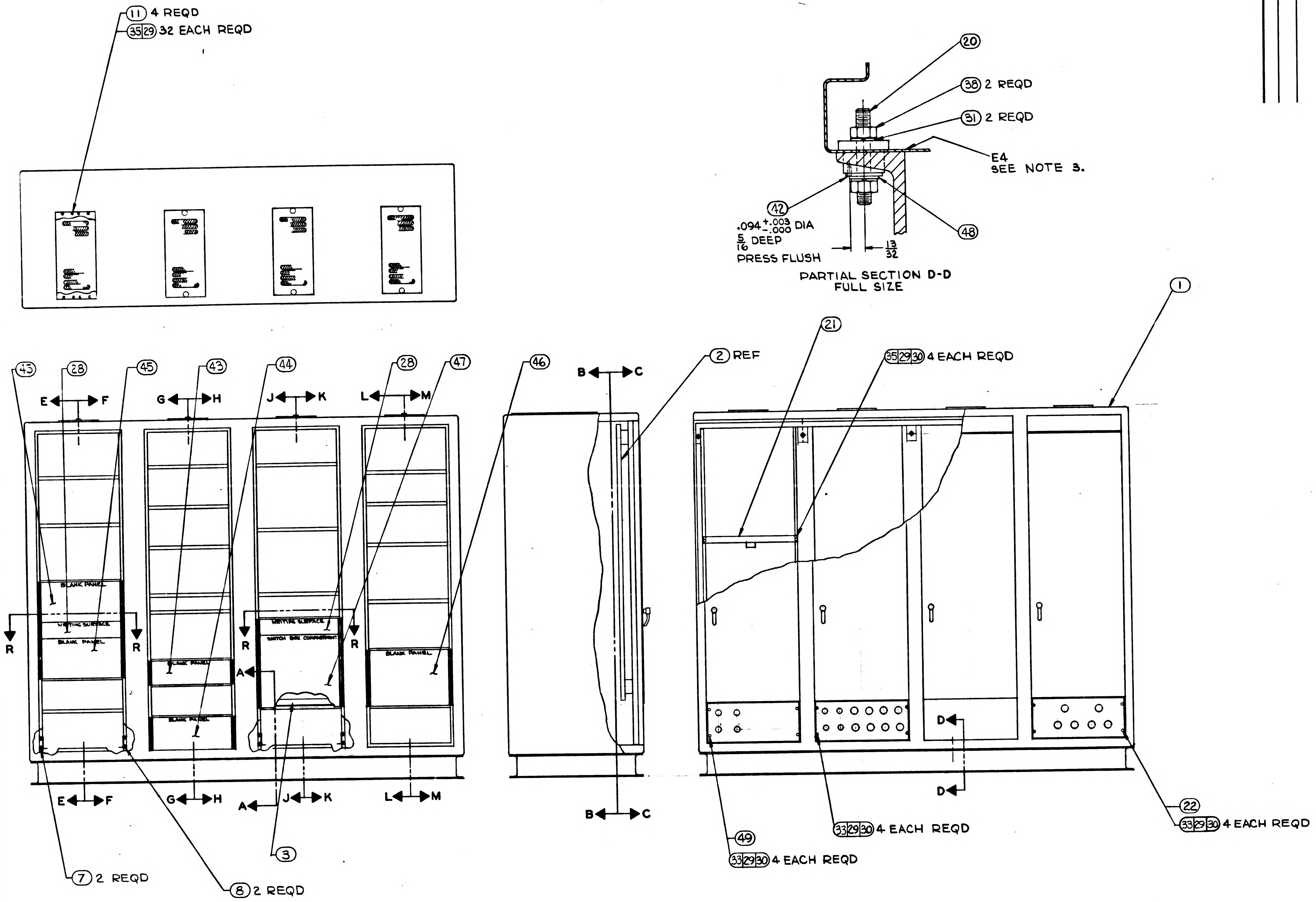
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P. T. Wersing DATE 14 June 63
CHECKED E. Fleming 17 July 63
APPROVAL G. Stoddard 18 Jul 63
APPROVAL [illegible]
NASA APPROVAL W. J. [illegible] 8-1-63
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY -
ELECTRICAL EQUIPMENT
OPTICS - INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE NOTED
SHEET 1 OF 8

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271 TDR 025		30 -- 63	C.A.V.



(11) 4 REQD
(35)(29) 32 EACH REQD
(20)
(38) 2 REQD
(31) 2 REQD
E4 SEE NOTE 3.
(42)
.094 +.003 -.000 DIA
5/16 DEEP
PRESS FLUSH
13/32
(48)
PARTIAL SECTION D-D
FULL SIZE
(1)
(21)
(35)(29)(30) 4 EACH REQD
(2) REF
(43)
(28)
(45)
(43)
(44)
(28)
(47)
(46)
E F
G H
J K
L M
B C
BLANK PANEL
WRITING SURFACE
BLANK PANEL
BLANK PANEL
BLANK PANEL
WRITING SURFACE
SWITCH BOX COMPARTMENT
BLANK PANEL
R R
R R
A
D
D
E F
G H
A J K
L M
B C
(3)
(7) 2 REQD
(8) 2 REQD
(49)
(33)(29)(30) 4 EACH REQD
(33)(29)(30) 4 EACH REQD
(22)
(33)(29)(30) 4 EACH REQD

FOR INFORMATION ONLY

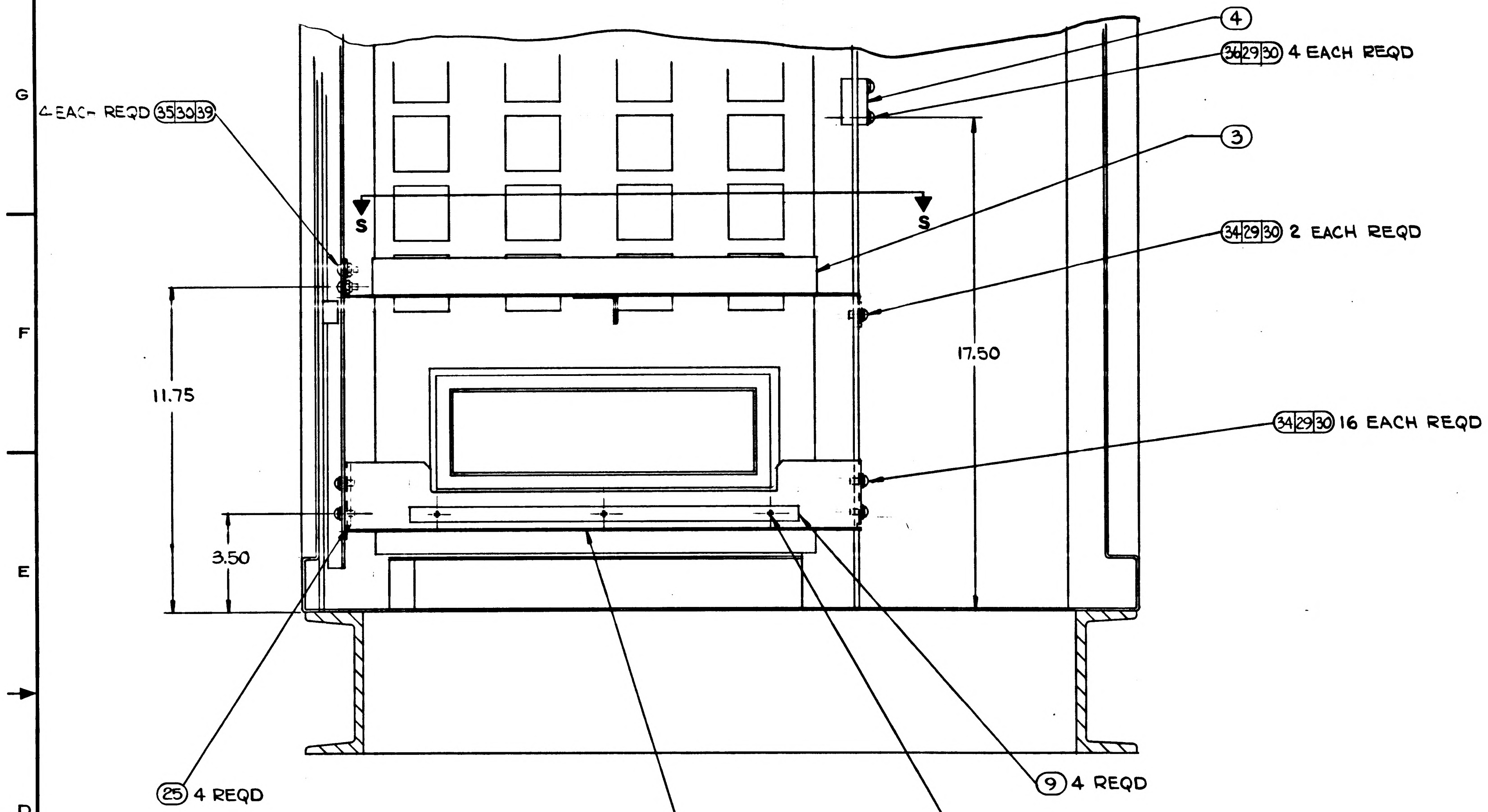
CLASS B RELEASE TDR No. 0250 DATE 14 Aug 63

Ⓓ **THIS SHEET ADDED**

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − − − DECIMALS +.02 −.02 ANGLES + − − − DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN Wegim DATE 14 JUNE 63 CHECKED E Fleming 7 JULY 63 APPROVAL G. STODDARD 18 JUL 63 APPROVAL 7/19/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS INERTIAL ANALYZER ASSEMBLY
APPLICATION		MATERIAL	NASA APPROVAL 8-14-63	CODE IDENT NO.	SIZE E	1900031
		CONTRACT NAS9-497	MIT APPROVAL	SCALE NOTED	SHEET 2 OF 2

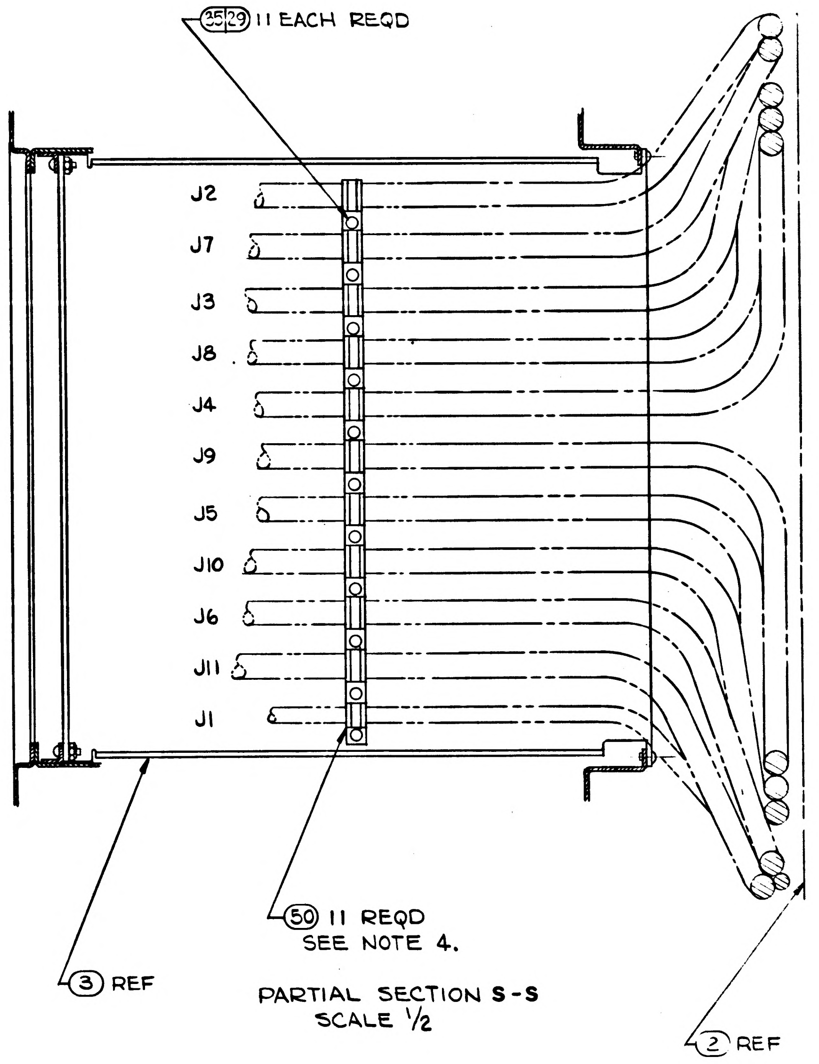
1900031

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		THIS SHEET ADDED PER MXC 188271 · [illegible] 02550	[illegible]	30 -6- 63	C.A.V.



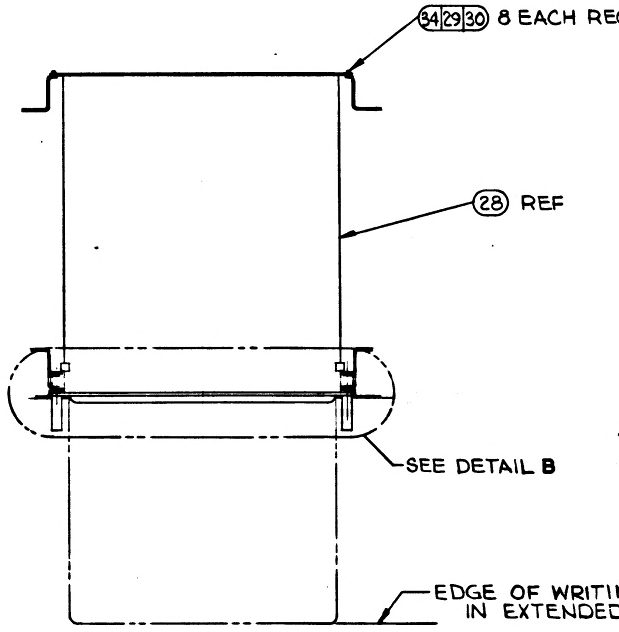
4
34 29 30 4 EACH REQD
4 EAC- REQD 35 30 39
3
S
S
34 29 30 2 EACH REQD
17.50
11.75
34 29 30 16 EACH REQD
3.50
25 4 REQD
9 4 REQD
7 REF
33 29 30 12 EACH REQD
INSTALL FROM FAR SIDE
4 PLACES

PARTIAL SECTION A-A
SCALE 1/2
SHT 2 ZONE C7



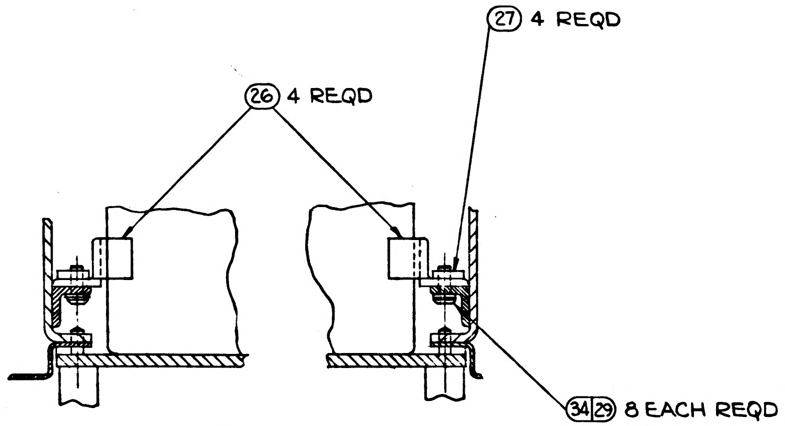
35 29 11 EACH REQD
J2
J7
J3
J8
J4
J9
J5
J10
J6
J11
J1
50 11 REQD
SEE NOTE 4.
3 REF
2 REF

PARTIAL SECTION S-S
SCALE 1/2



34 29 30 8 EACH REQD
28 REF
SEE DETAIL B
EDGE OF WRITING SURFACE
IN EXTENDED POSITION.

PARTIAL SECTION R-R
SCALE 1/4
SHT 2 ZONE D 7 & 8



27 4 REQD
26 4 REQD
34 29 8 EACH REQD

DETAIL B
SCALE-FULL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 **DATE** 14 [illegible] 63

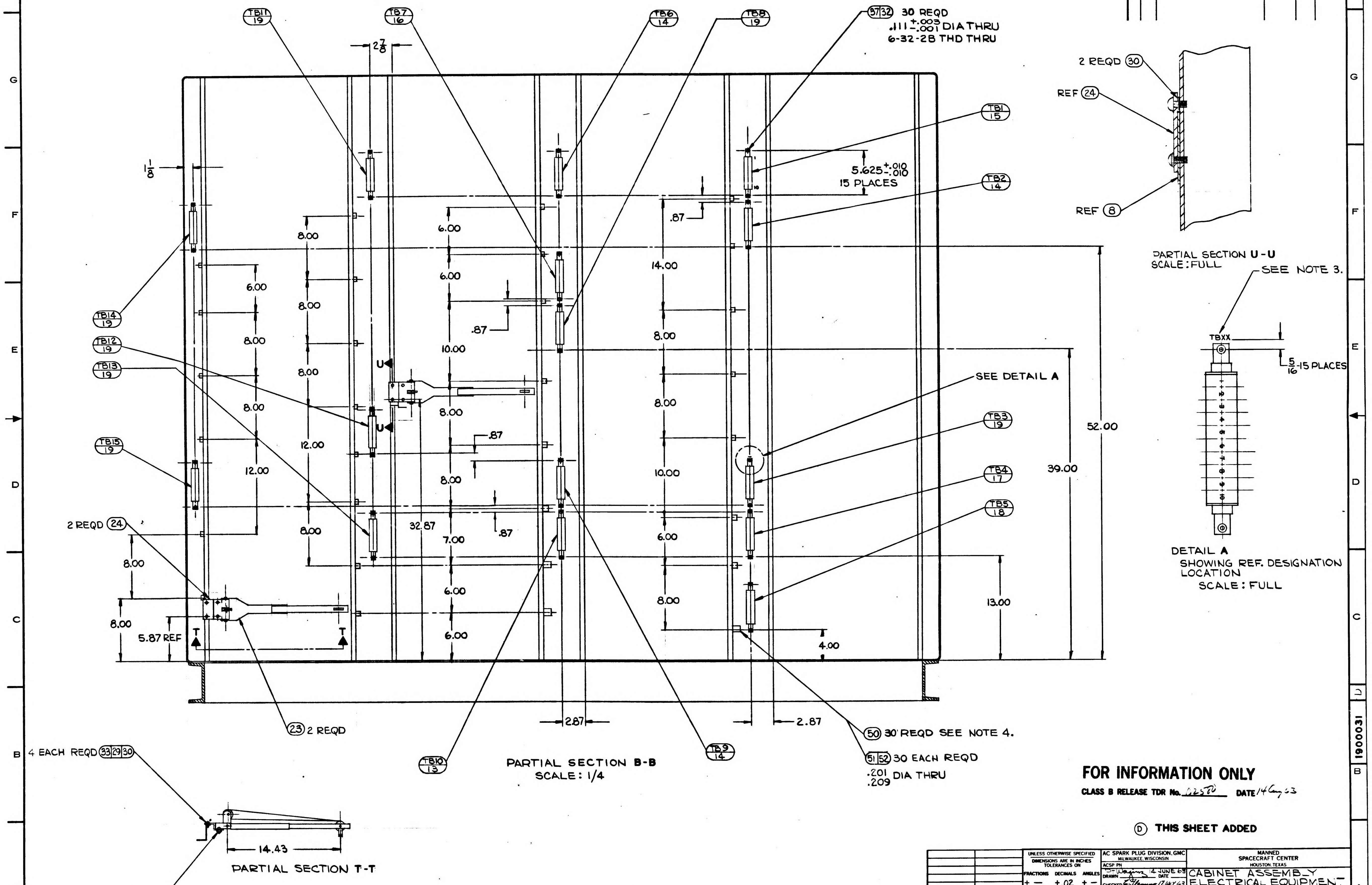
Ⓓ **THIS SHEET ADDED**

NEXT ASSY / USED ON APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + - - - DECIMALS +.02 -.02 ANGLES + - - - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN P. Wagins DATE 14 JUNE 63 CHECKED I. Fleming 17 JULY 63 APPROVAL C. Stoddard [illegible] 63 APPROVAL L. Gelman 7/18/63	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS-INERTIAL ANALYZER ASSEMBLY
	MATERIAL CONTRACT NAS9-497	NASA APPROVAL W. J. [illegible] 8-14-63 MIT APPROVAL [illegible] 14 [illegible] 63	CODE IDENT NO. SIZE E 1900031 SCALE NOTED SHEET 3 OF 3

1900031 D

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		THIS SHEET ADDED PER MXC 188271 TDR 02580	14 Aug 63	30 JUL 63	



TB11 19
TB7 16
TB6 14
TB8 19
37 32 30 REQD
.111 +.003 -.001 DIA THRU
6-32-28 THD THRU
2 7/8
1 1/8
TB1 15
5.625 +.010 -.010
15 PLACES
TB2 14
.87
8.00
6.00
14.00
6.00
.87
10.00
TB14 19
TB12 19
TB13 19
TB15 19
U
SEE DETAIL A
TB3 19
TB4 17
TB5 18
52.00
39.00
13.00
12.00
32.87
7.00
2 REQD 24
8.00
5.87 REF
T
4.00
2.87
23 2 REQD
TB10 13
TB9 14
50 30 REQD SEE NOTE 4.
51 52 30 EACH REQD
.201 .209 DIA THRU
PARTIAL SECTION B-B
SCALE: 1/4
2 REQD 30
REF 24
REF 8
PARTIAL SECTION U-U
SCALE: FULL
SEE NOTE 3.
TBXX
5/16 15 PLACES
DETAIL A
SHOWING REF. DESIGNATION LOCATION
SCALE: FULL
4 EACH REQD 33 29 30
14.43
PARTIAL SECTION T-T
4 EACH REQD 34 30 39

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 DATE 14 Aug 63

Ⓓ THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+.02	+ —
— —	—.02	— —

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

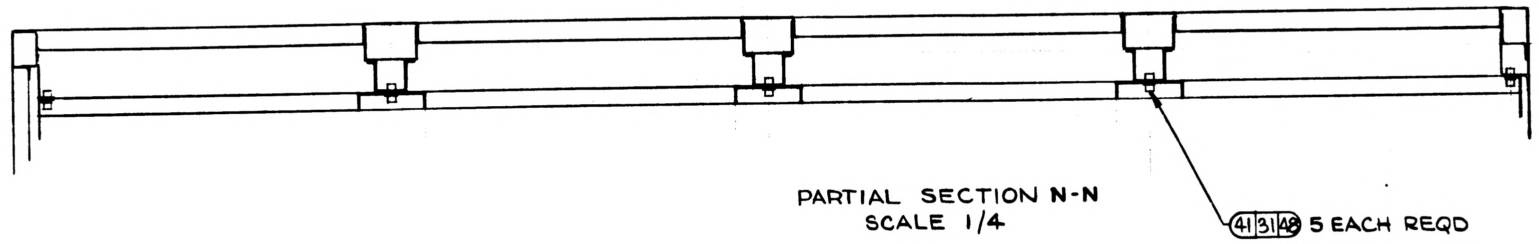
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN S. Wagner DATE 14 JUNE 63
CHECKED E. Fleming 17 JULY 63
APPROVAL G. Stoddard 18 Jul 63
APPROVAL L. Gedman 8/14/63
NASA APPROVAL W. J. Rhine 8-14-63
MIT APPROVAL W. Wagner 14 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

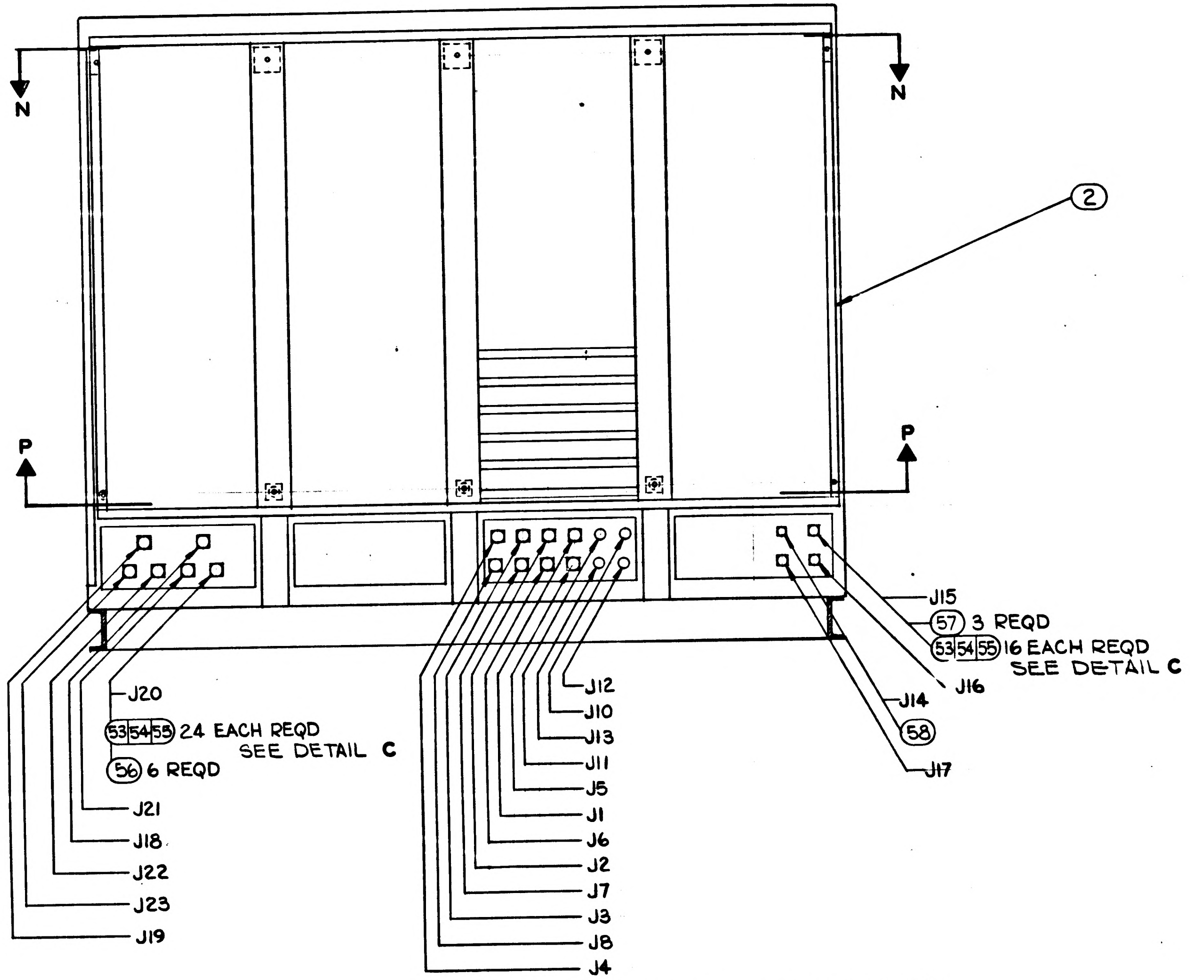
CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS-INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE NOTED
SHEET 4 OF 5

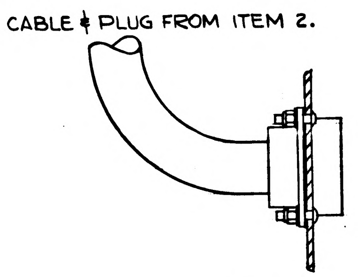
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		THIS SHEET ADDED PER MXC 1882714		30-4-63	C.A.


41 31 48 5 EACH REQD

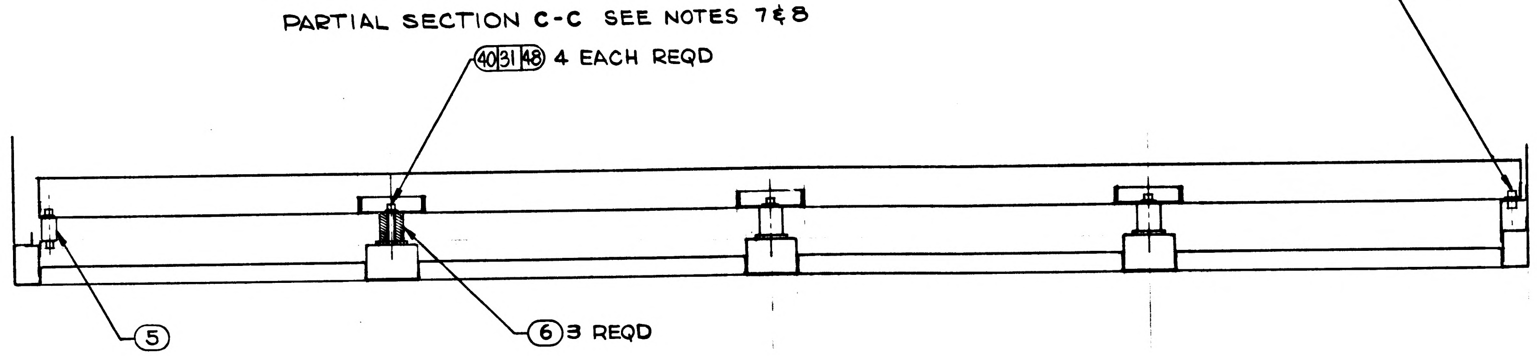
PARTIAL SECTION N-N
SCALE 1/4


N
N
2
P
P
J15
57 3 REQD
53 54 55 16 EACH REQD
SEE DETAIL C
J16
J14
58
J17
J20
53 54 55 24 EACH REQD
SEE DETAIL C
56 6 REQD
J21
J18
J22
J23
J19
J12
J10
J13
J11
J5
J1
J6
J2
J7
J3
J8
J4

PARTIAL SECTION C-C SEE NOTES 7 & 8


CABLE & PLUG FROM ITEM 2.

DETAIL C
INSTALLATION OF J14 THRU J23.


41 31 48
40 31 48 4 EACH REQD
5
6 3 REQD

PARTIAL SECTION P-P
SCALE 1/4

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 DATE 14 Aug 63

Ⓓ THIS SHEET ADDED

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + - - - DECIMALS +.02 -.02 ANGLES + - - - DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE WISCONSIN ACSP PN
APPLICATION		MATERIAL	DRAWN S. Wegim DATE 14 JUNE 63 CHECKED E. Fleming 17 JULY 63 APPROVAL G. Stoddard 8 Jul 63 APPROVAL C. Jelema 7/14/63 NASA APPROVAL 8-14-63 MIT APPROVAL 14 Aug 63
		CONTRACT NAS9-497	

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS-INERTIAL
ANALYZER ASSEMBLY

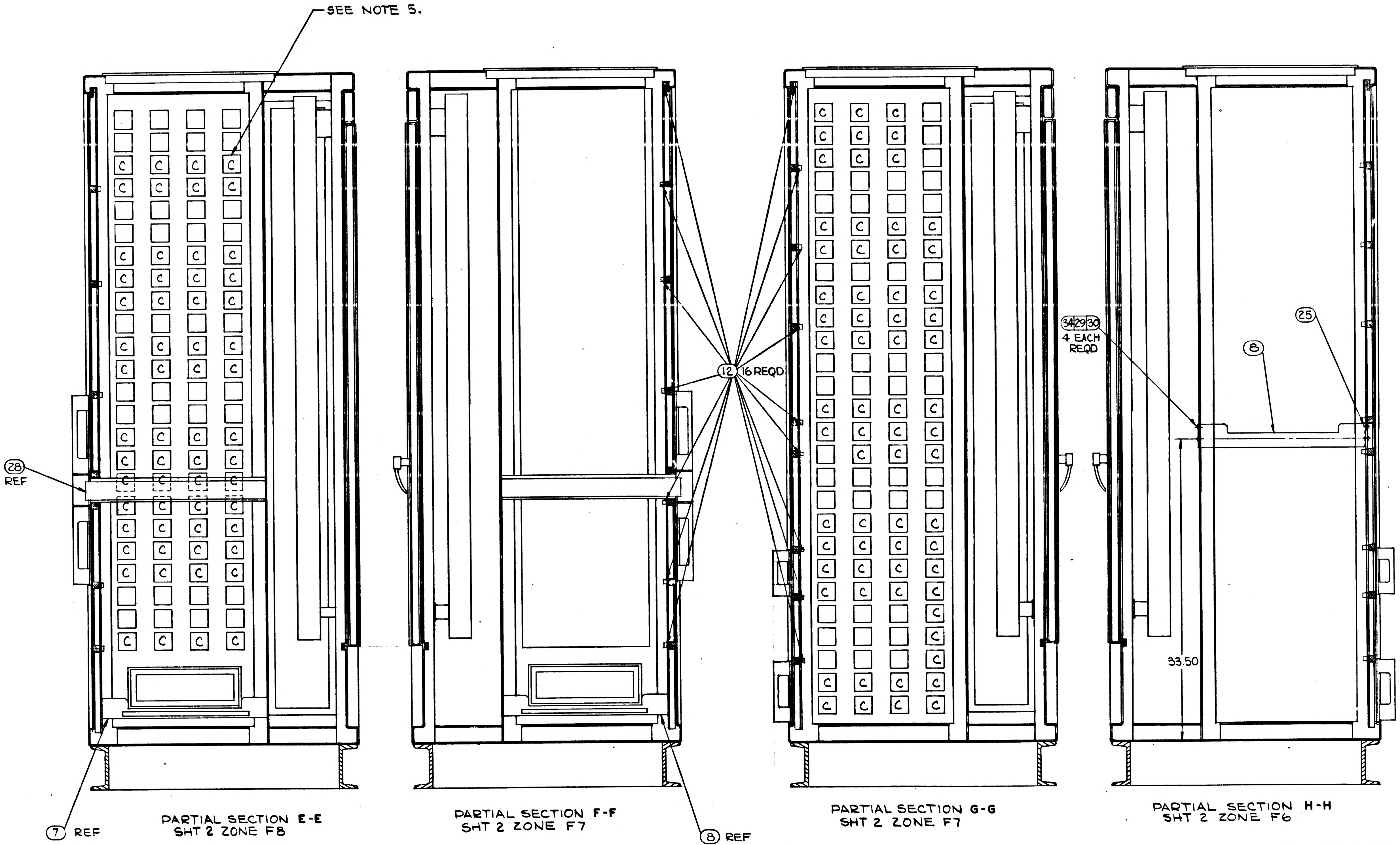
CODE IDENT NO. SIZE E 1900031

SCALE NOTED SHEET [illegible]

1900031 D

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		THIS SHEET ADDED PER MXC 188271		30 Jul 63	C.A.V.



PARTIAL SECTION E-E SHT 2 ZONE F8

PARTIAL SECTION F-F SHT 2 ZONE F7

PARTIAL SECTION G-G SHT 2 ZONE F7

PARTIAL SECTION H-H SHT 2 ZONE F6

(D) THIS SHEET ADDED

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. D258U DATE 14 Aug 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ –	+.02	+ –
– –	–.02	– –

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN Wergin DATE
CHECKED E. Fleming 17 Jul 63
APPROVAL C. Sgaaso 18 Jul 63
APPROVAL Gelman 8/14/63
NASA APPROVAL W.J. Blum 8-14-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

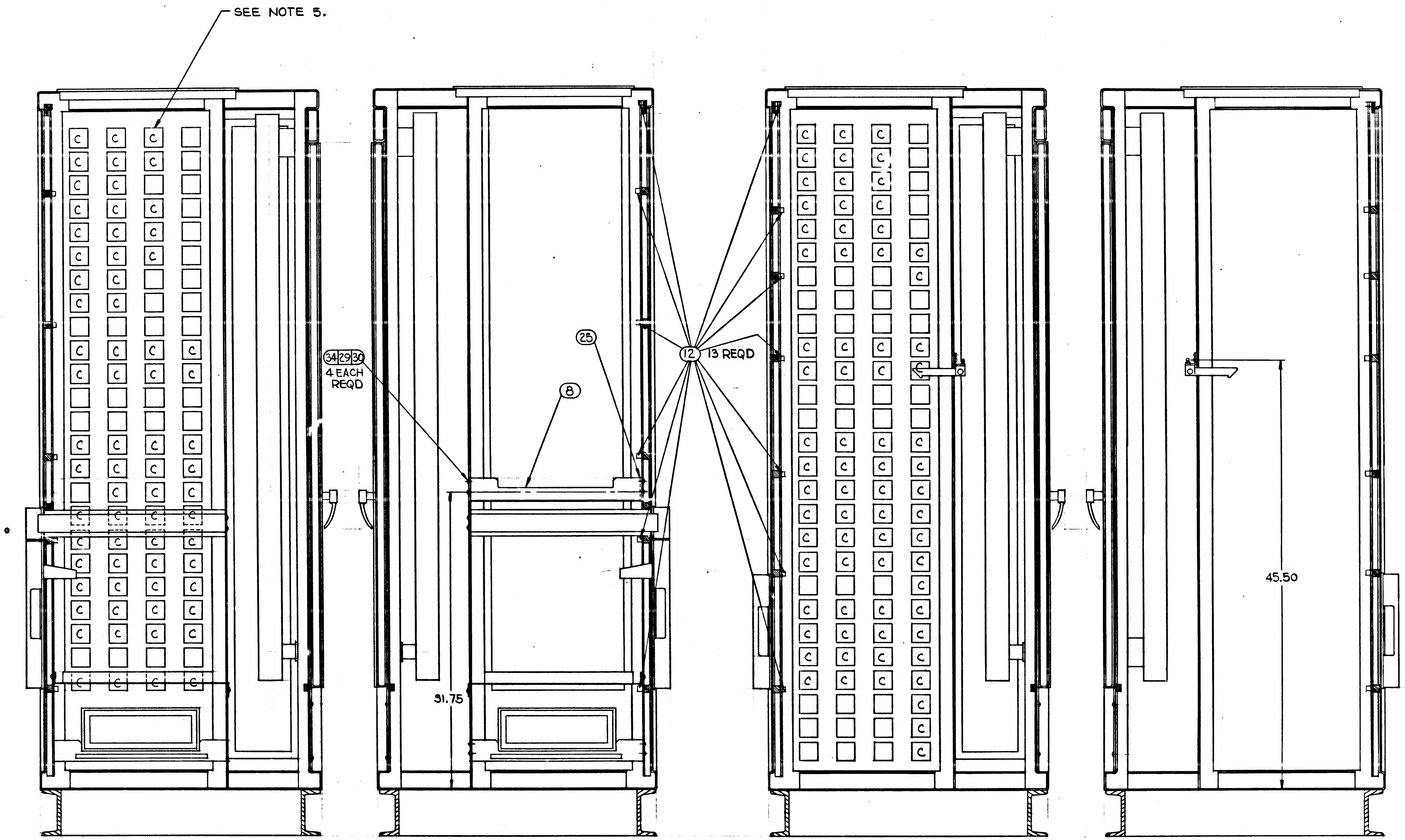
CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE 1/4
SHEET 6 OF 8

1900031

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		THIS SHEET ADDED PER MXC 18827, [illegible]	[illegible]	30-[illegible]-63	C.A.M.



PARTIAL SECTION J-J
SHT 2 ZONE F8

PARTIAL SECTION K-K
SHT 2 ZONE F7

PARTIAL SECTION L-L
SHT 2 ZONE F7

PARTIAL SECTION M-M
SHT 2 ZONE F6

Ⓓ THIS SHEET ADDED

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 0258 DATE 14 [illegible] 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ −	+.02	+ −
− −	−.02	− −

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-947

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Wiegins DATE
CHECKED E. Fleming 17 JULY 63
APPROVAL C. Stoddard [illegible] 63
APPROVAL [illegible] 8/14/63
NASA APPROVAL W. J. [illegible] 8-14-63
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

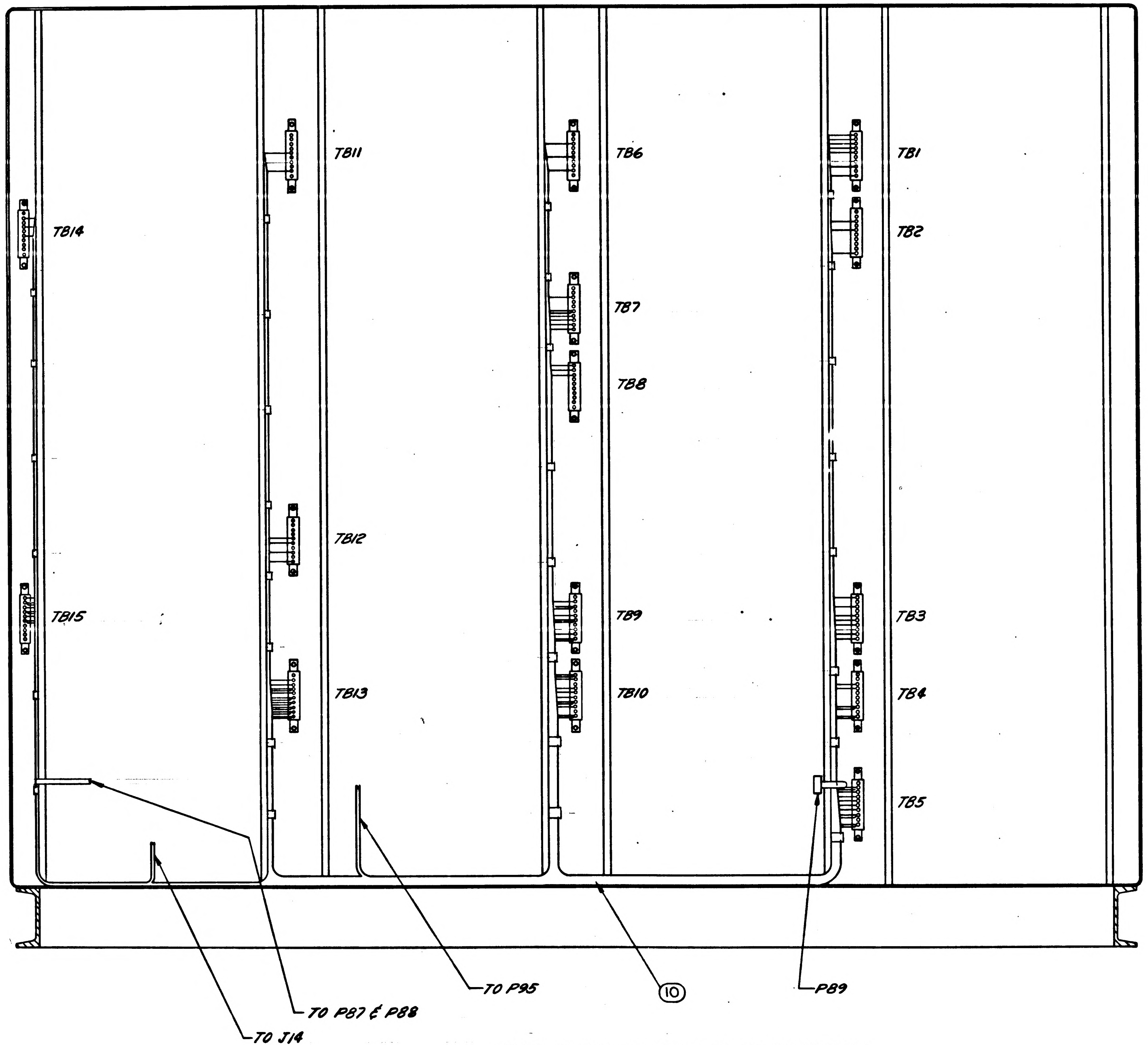
CABINET ASSEMBLY
ELECTRICAL EQUIPMENT-
OPTICS-INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE 1/4
SHEET [illegible] OF 3

1900031

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271 TDR D2580 14AUG63		30 JUL 63	C.G.M. / E F



VIEW SHOWING ITEM 10 IN POSITION

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. D2580 DATE 14Aug63

Ⓓ THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +− −−
DECIMALS +.02 −.02
ANGLES +− −−
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P. Bandoski DATE 17 JUNE 63
CHECKED E. Fleming 17 JUL 63
APPROVAL G. Stoddard 18 Jul 63
APPROVAL [illegible] 8/14/63
NASA APPROVAL W. G. [illegible] 8-14-63
MIT APPROVAL W. [illegible]

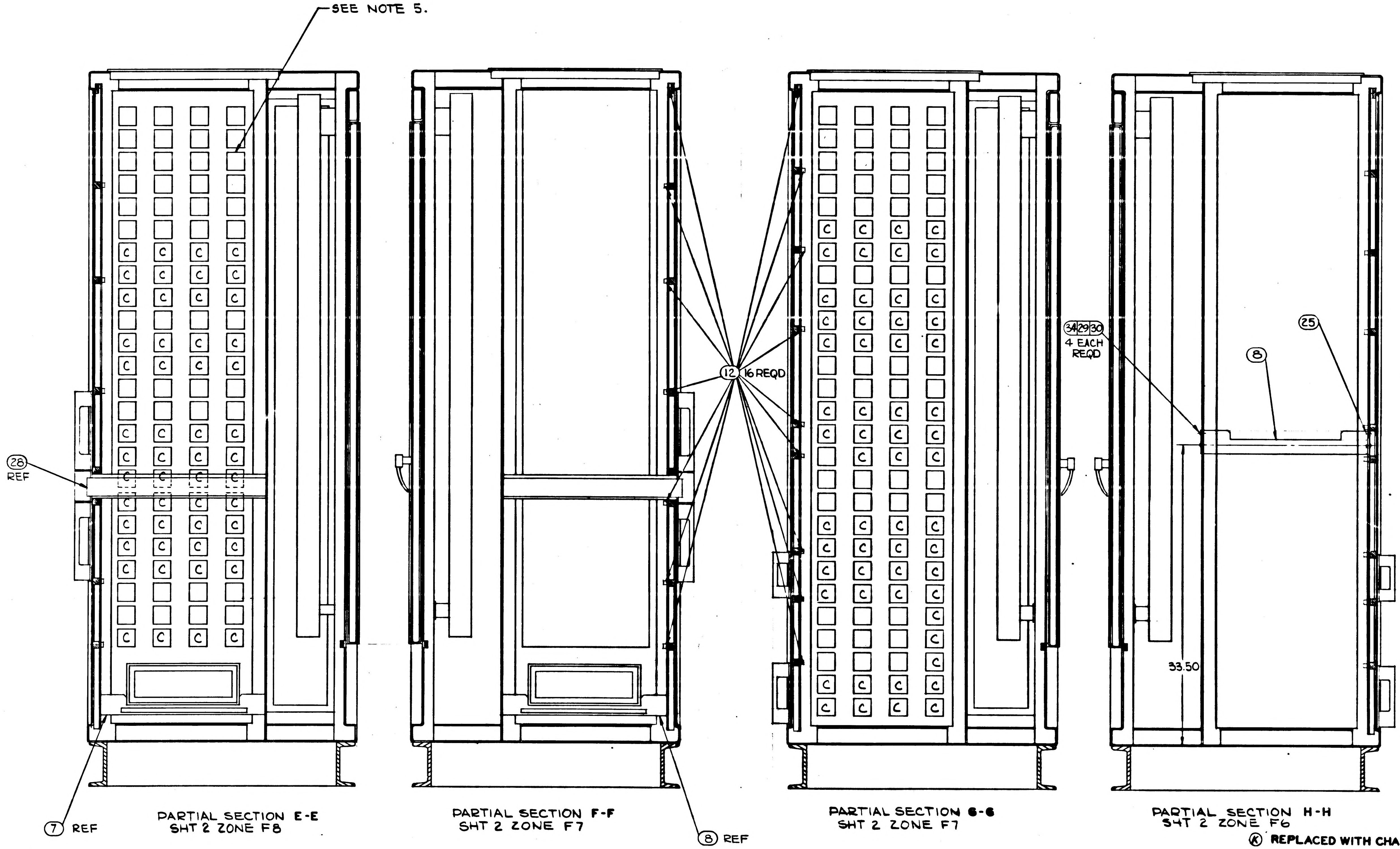
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE 1/4
SHEET 3 OF 3

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
⊙ D		THIS SHEET ADDED PER MXC 188271 TDR 0268 14 AUG 63 WR		30 JUL 63	C.A.M. / E F
K		REPLACED WITH CHANGE BY REV. L PER CM 192872 REPLACED PER TORR 07470		JAN 64 2-9-66	EM. / R.J.



PARTIAL SECTION E-E
SHT 2 ZONE F8

PARTIAL SECTION F-F
SHT 2 ZONE F7

PARTIAL SECTION G-G
SHT 2 ZONE F7

PARTIAL SECTION H-H
SHT 2 ZONE F6

Ⓚ REPLACED WITH CHANGE BY REV L

Ⓓ THIS SHEET ADDED

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. D258U DATE 14 Aug 63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ −	+.02	+ −
− −	−.02	− −

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

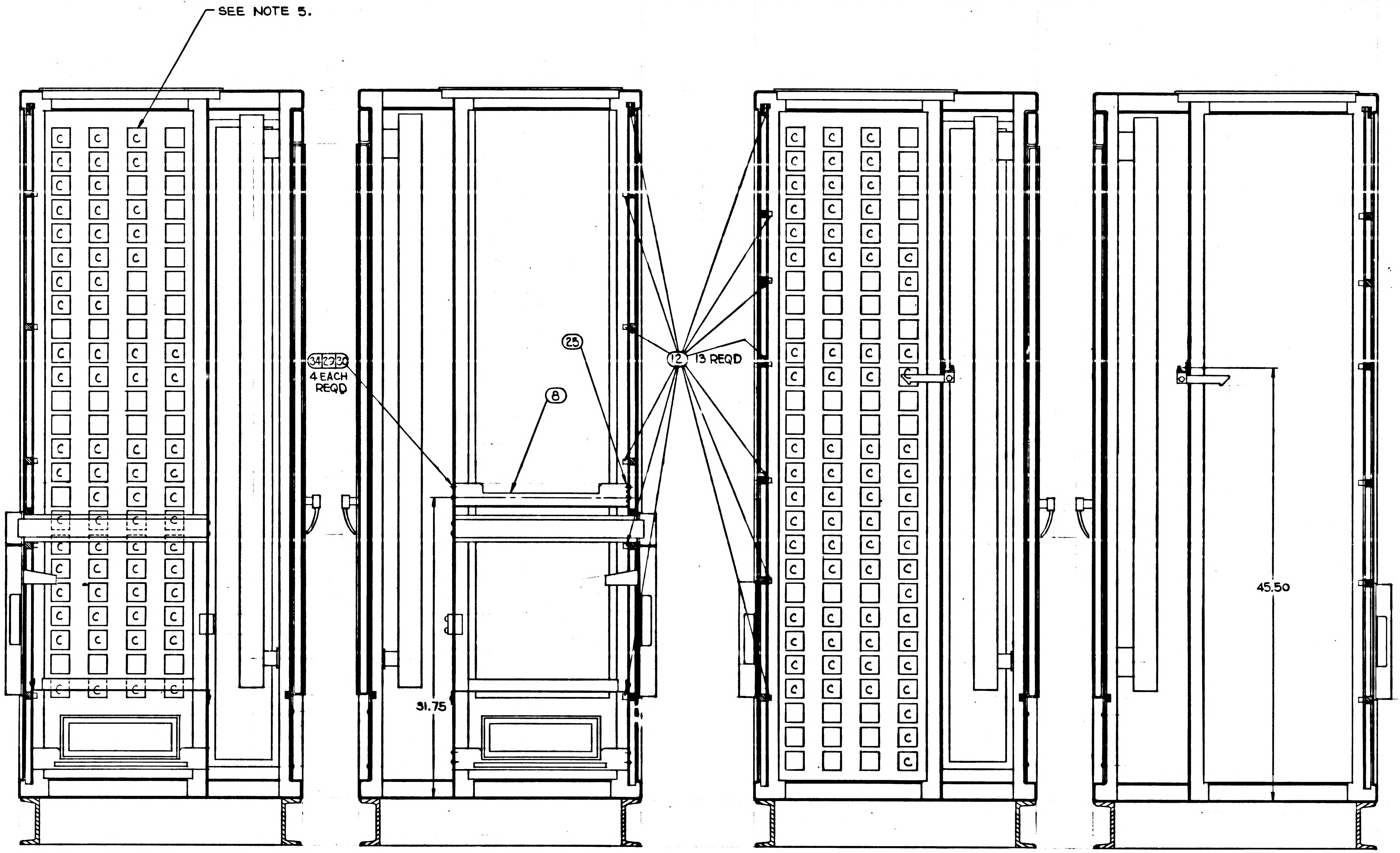
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN
DATE
CHECKED 12 Jul 63
APPROVAL
APPROVAL
NASA APPROVAL 8-14-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE 1/4
SHEET 6 OF 8

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 18827/10RR0258	[illegible]	30 JUL 63	C.A.M. E
E		CHANGE IN ACCORDANCE WITH MXC 189072		5 SEP 63	J.O. AU
K		REPLACED WITH CHANGE BY REV. L PER CM 192872		10 JAN 66	E.M. R.D.
		REPLACED PER TORR 07470		[illegible]	[illegible]



PARTIAL SECTION J-J
SHT 2 ZONE F8

PARTIAL SECTION K-K
SHT 2 ZONE F7

PARTIAL SECTION L-L
SHT 2 ZONE F7

PARTIAL SECTION M-M
SHT 2 ZONE F6

Ⓚ REPLACED WITH CHANGE BY REV -

Ⓓ THIS SHEET ADDED

FOR INFORMATION ONLY
CLASS II RELEASE TDR No. 0250 DATE 14 Jan 67

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + – – –
DECIMALS +.02 –.02
ANGLES + – – –
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-947

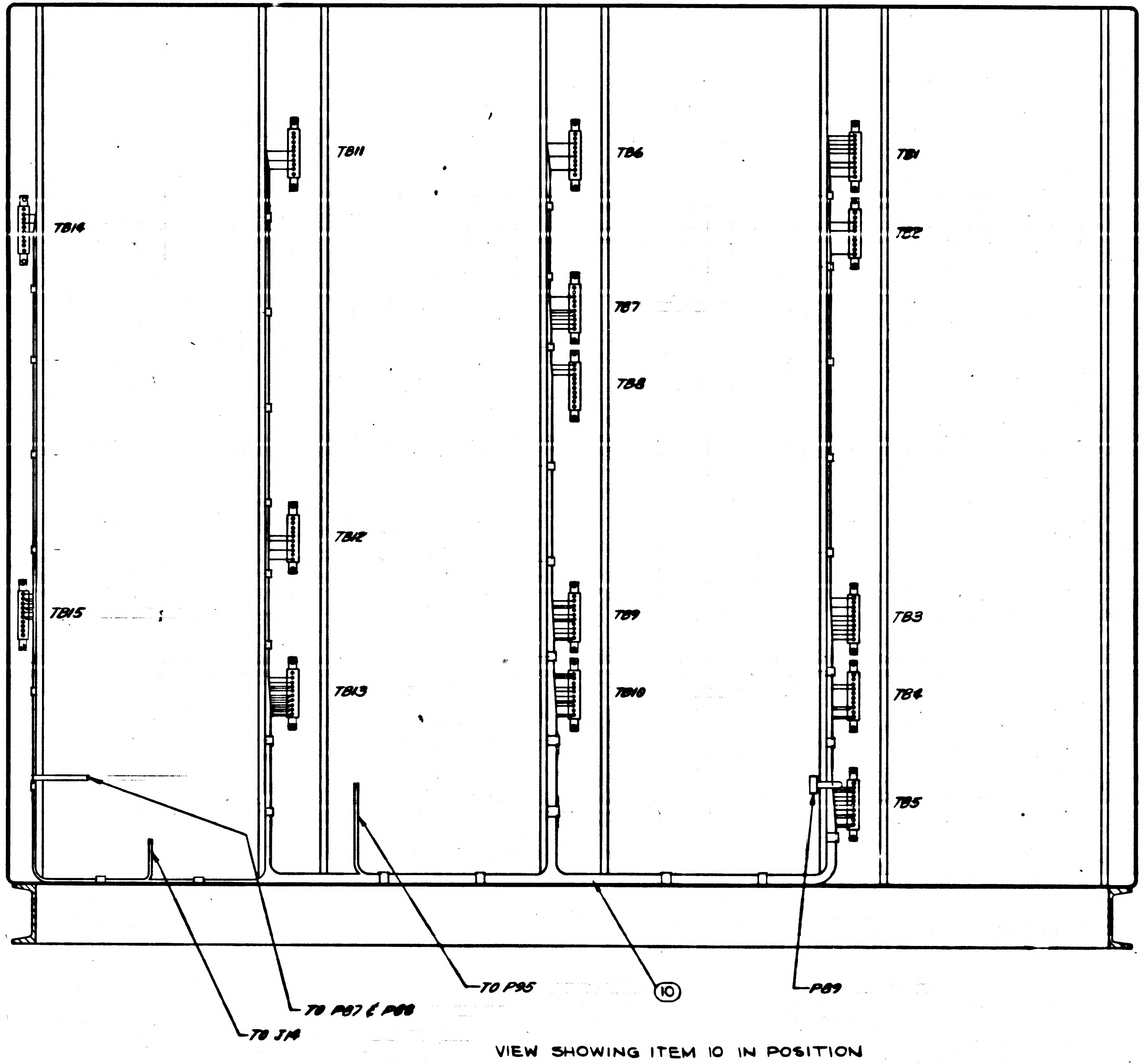
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN D. Wegins DATE
CHECKED E. Fleming 17 JUL 63
APPROVAL G. Spooner 16 Jul 63
APPROVAL L. J. Oman 8/14/63
NASA APPROVAL W. J. Blume 8-14-63
MIT APPROVAL W. Griff. M.I.T.

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS-INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031
SCALE 1/4
SHEET 7 OF 8

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
Ⓓ D		THIS SHEET ADDED PER MXC 188271 TDR D250 14Aug63 WR		30 JUL 63	C.A.M. / E
E		CHANGE IN ACCORDANCE WITH MXC 89072		5 SEP 63	JD. / AU
K		REPLACED WITH CHANGE BY REV. PER CM 92872 REPLACED PER TORR 0747C		10 JAN 64 3-7-66	E.M. / R.D.



VIEW SHOWING ITEM 10 IN POSITION

Ⓚ REPLACED WITH CHANGE BY REV "L"

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. D250 DATE 14Aug63

Ⓓ THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+−	+.02	+−
−−	−.02	−−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN 17 Jul 63 DATE
CHECKED E Fleming 17 Jul 63
APPROVAL G. Stoddard 14 Aug 63
APPROVAL 8/14/63
NASA APPROVAL 8-14-63
MIT APPROVAL

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SPACECRAFT CENTER
HOUSTON, TEXAS

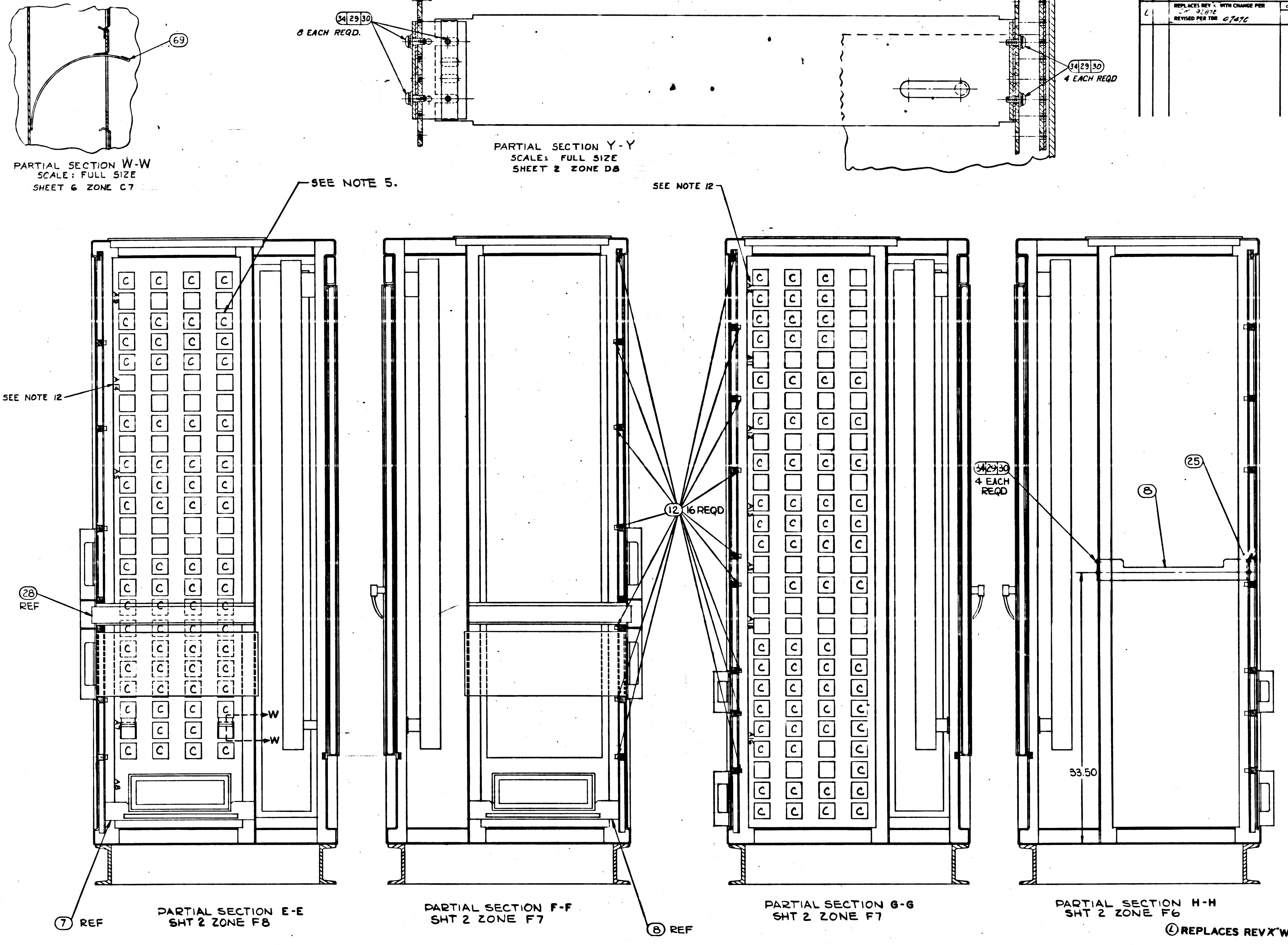
CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO. SIZE E 1900031

SCALE 1/4 SHEET 5 OF 8

1900031 K

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
L		REPLACES REV K WITH CHANGE PER CN 92872 REVISED PER TDR 07470		JAN 64	EM


69
34 29 30
8 EACH REQD.
34 29 30
4 EACH REQD
SEE NOTE 5.
SEE NOTE 12
SEE NOTE 12
28
REF
12
16 REQD
34 29 30
4 EACH
REQD
8
25
33.50
W
W
7 REF
8 REF

PARTIAL SECTION W-W
SCALE: FULL SIZE
SHEET 6 ZONE C7

PARTIAL SECTION Y-Y
SCALE: FULL SIZE
SHEET 2 ZONE D8

PARTIAL SECTION E-E
SHT 2 ZONE F8

PARTIAL SECTION F-F
SHT 2 ZONE F7

PARTIAL SECTION G-G
SHT 2 ZONE F7

PARTIAL SECTION H-H
SHT 2 ZONE F6

Ⓛ REPLACES REV X WITH CHANGE

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 02580 DATE 14Aug63

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +- --
DECIMALS +.02 -.02
ANGLES +- --
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN P. Wergin DATE
CHECKED E. Flemming 17Jul63
APPROVAL C. Spaan 18Jul63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

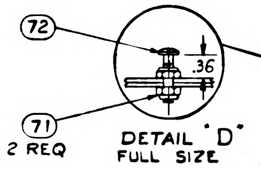
CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO
SIZE E
1900031
SCALE 1/4
SHEET 6 OF 8

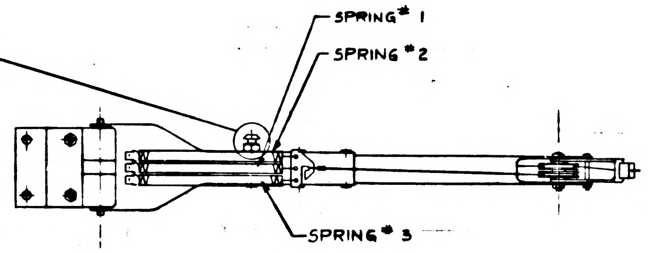
L
1900031

ALL CABLE RETRACTORS
HAVE 3 SPRINGS
UNLESS SHOWN BELOW

DRAWER NUMBER	SPRINGS REQUIRED		
	#1	#2	#3
A2	NO	YES	YES
A31	NO	YES	YES
A16	YES	NO	NO
A3	NO	YES	YES
A19	NO	YES	YES
A20	NO	YES	YES
A18	NO	YES	YES
A10	NO	YES	YES
A4	NO	YES	YES
A26	NO	YES	YES
A6	YES	NO	NO
A29	YES	NO	NO

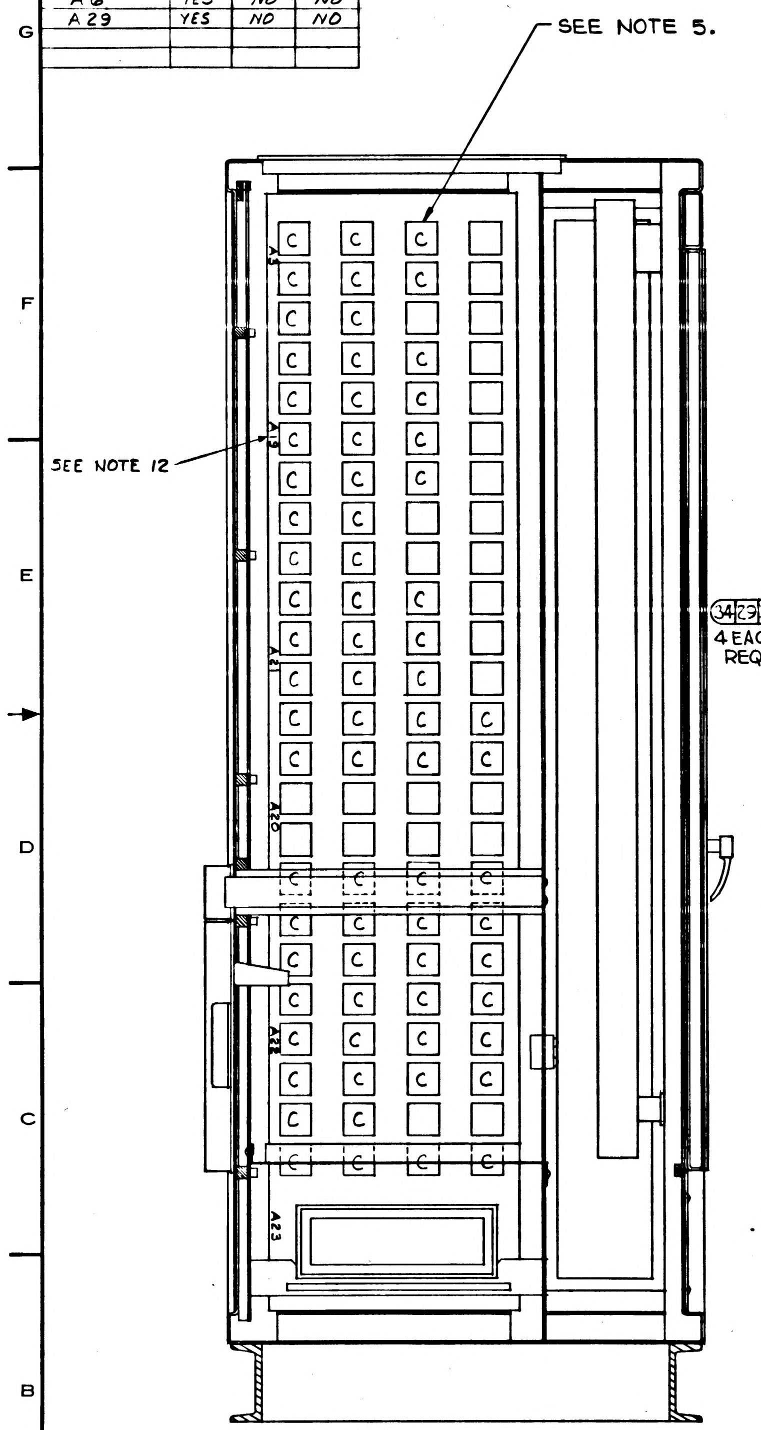

72
.36
71
2 REQ

DETAIL "D"
FULL SIZE

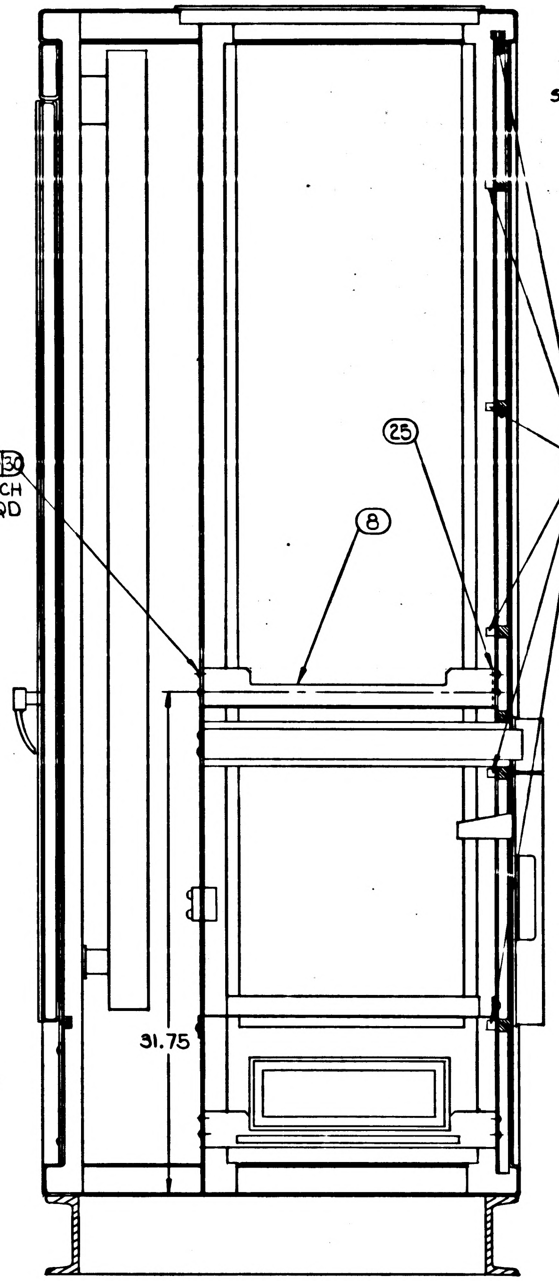

SPRING# 1
SPRING# 2
SPRING# 3

VIEW X-X
HALF SIZE
SHEET 4 ZONE A7

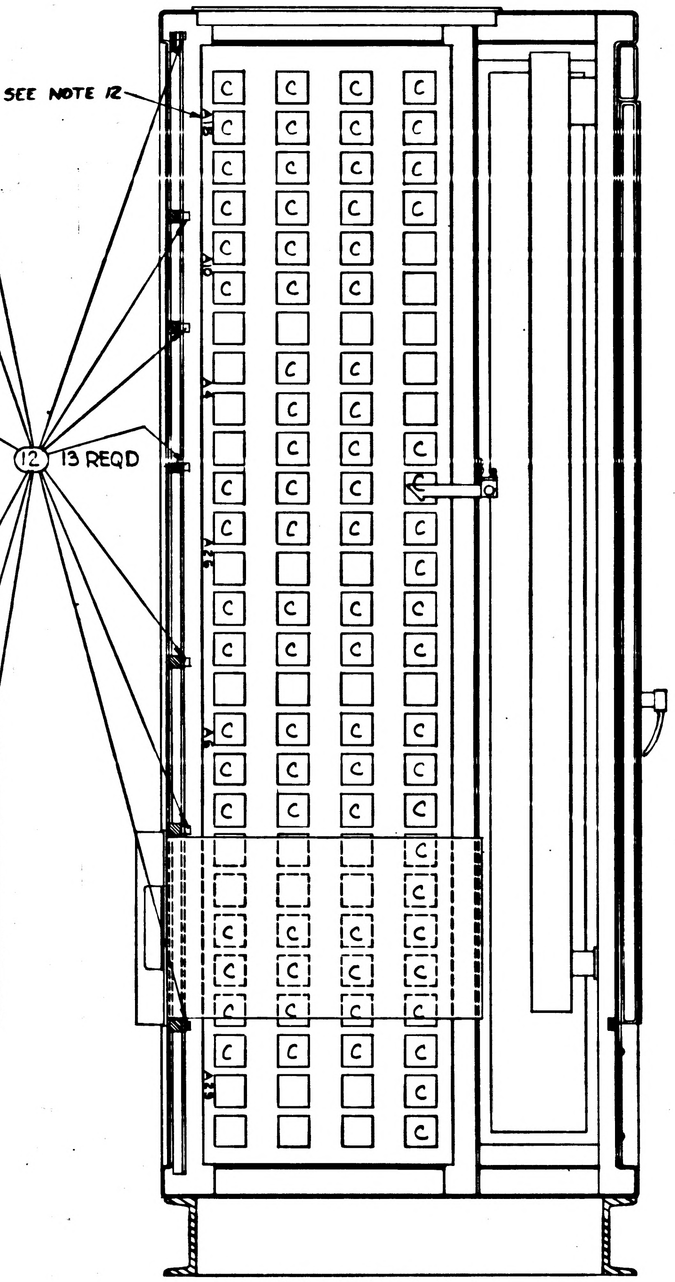
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
L		REPLACES REV. K WITH CHANGE PER CM 92872		10 JAN 64	EM / R.D.
P	—	CHANGE IN ACCORDANCE WITH CV-9368 REVISE PER TDRR 07470	—	24-JAN-64 4-7-66	JB / PZ


SEE NOTE 5.
SEE NOTE 12
34 29 30
4 EACH
REQD
A23

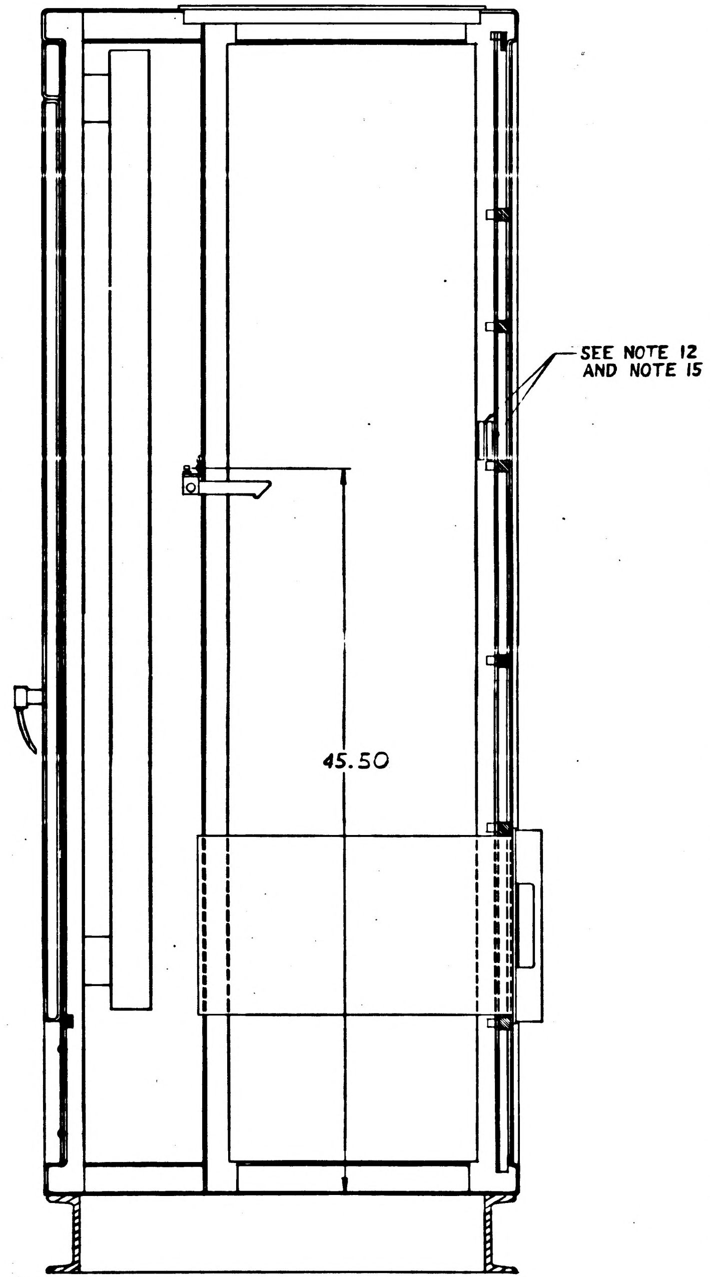
PARTIAL SECTION J-J
SHT 2 ZONE F8



PARTIAL SECTION K-K
SHT 2 ZONE F7


SEE NOTE 12
12
13 REQD

PARTIAL SECTION L-L
SHT 2 ZONE F7


SEE NOTE 12
AND NOTE 15
45.50

PARTIAL SECTION M-M
SHT 2 ZONE F6

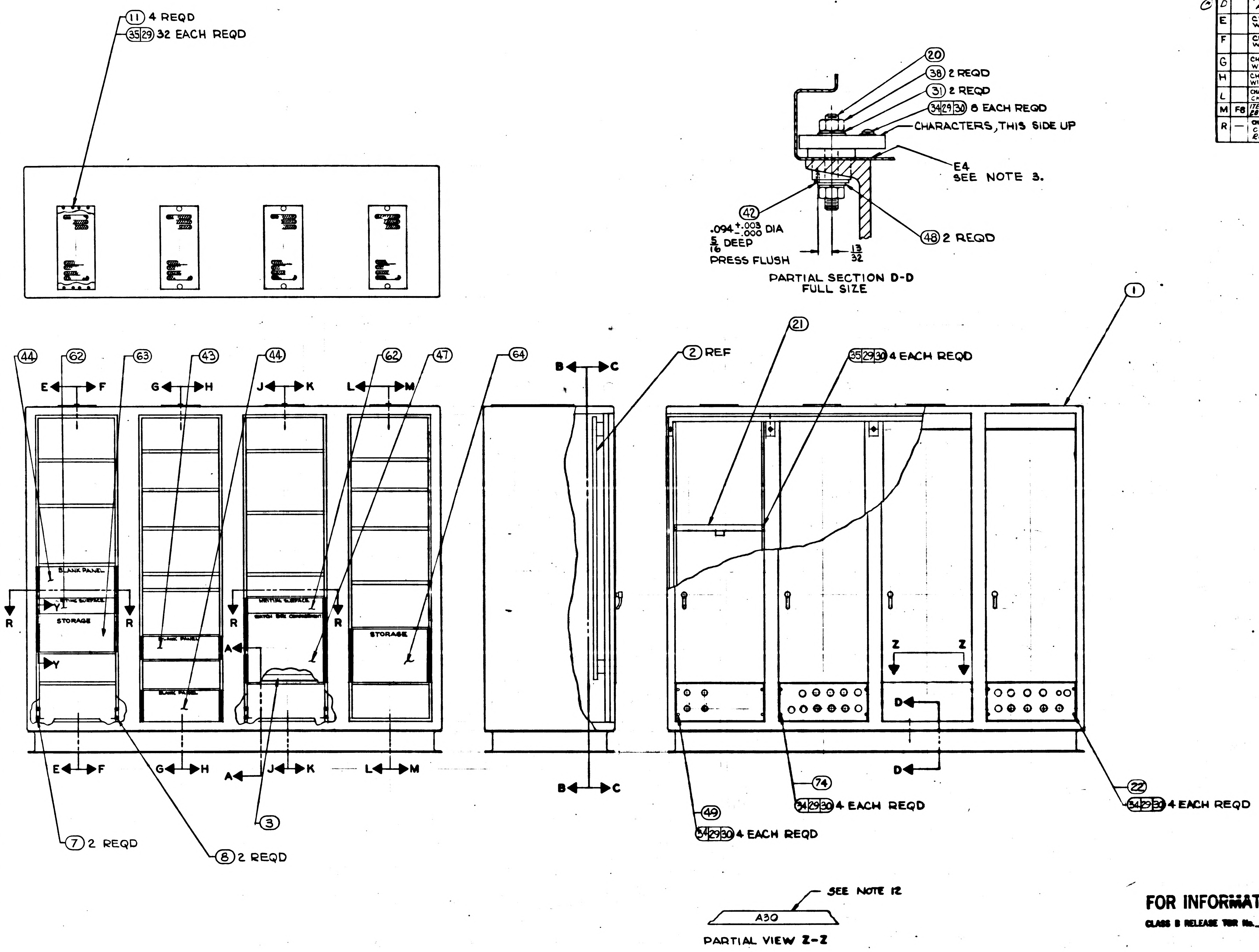
Ⓛ REPLACES REV K WITH CHANGE

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 02550 DATE 1/40/67

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES + — +.02 + — — — -.02 — — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN DATE CHECKED 17 JUL 63 APPROVAL APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	CABINET ASSEMBLY ELECTRICAL EQUIPMENT OPTICS-INERTIAL ANALYZER ASSEMBLY
APPLICATION		MATERIAL CONTRACT NAS9-947	NASA APPROVAL MIT APPROVAL	CODE IDENT NO. SCALE 1/4	SIZE E 1900031 SHEET 7 OF 8

1900031 P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
Ⓓ D		THIS SHEET ADDED PER MXC 188271 TDRR 02558		30 JUL 63	C.A.M.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G		CHANGE IN ACCORDANCE WITH MXC 189686		9 SEP 63	J.J.J.
H		CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
L		CHANGE IN ACCORDANCE WITH CM 192872		10 JAN 64	E V R.D.
M	F8	ITEM 62 (1) 1900345-021 WAS ITEM 28 (1) 1900345-011 PER CM 193187		13 JAN 64	EM
R	—	CHANGE IN ACCORDANCE WITH CM-193683 REVISE PER TDRR 07470		28-JAN-64 4-7-64	JB WK



8
7
6
5
4
3
2
1
H
G
F
E
D
C
B
A
(11) 4 REQD
(35)(29) 32 EACH REQD
(20)
(38) 2 REQD
(31) 2 REQD
(34)(29)(30) 8 EACH REQD
CHARACTERS, THIS SIDE UP
E4
SEE NOTE 3.
(42)
.094 +.003 -.000 DIA
5/16 DEEP
PRESS FLUSH
13/32
(48) 2 REQD
PARTIAL SECTION D-D
FULL SIZE
(1)
(44)
(62)
(63)
(43)
(44)
(62)
(47)
(64)
(2) REF
(21)
(35)(29)(30) 4 EACH REQD
E F
G H
J K
L M
B C
BLANK PANEL
WRITING SURFACE
STORAGE
Y
R
R
R
R
BLANK PANEL
BLANK PANEL
WRITING SURFACE
WATCH SIDE COMPARTMENT
A
STORAGE
Z Z
D
E F
G H
A
J K
L M
B C
D
(3)
(7) 2 REQD
(8) 2 REQD
(49)
(34)(29)(30) 4 EACH REQD
(74)
(34)(29)(30) 4 EACH REQD
(22)
(34)(29)(30) 4 EACH REQD
SEE NOTE 12
A30
PARTIAL VIEW Z-Z

FOR INFORMATION ONLY
CLASS II RELEASE TDR No. 02550 DATE 14 Aug 63

Ⓓ THIS SHEET ADDED

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS +− −− DECIMALS +.02 −.02 ANGLES +− −− DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN
APPLICATION		MATERIAL	ACSP PN
		CONTRACT NAS9-497	DRAWN T. Wegner DATE 14 JUNE 63 CHECKED E. Fleming 17 JULY 63 APPROVAL G. Stoddard 19 July 63 APPROVAL L. Gelman 7/19/63 NASA APPROVAL 8-14-63 MIT APPROVAL 14 Aug 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

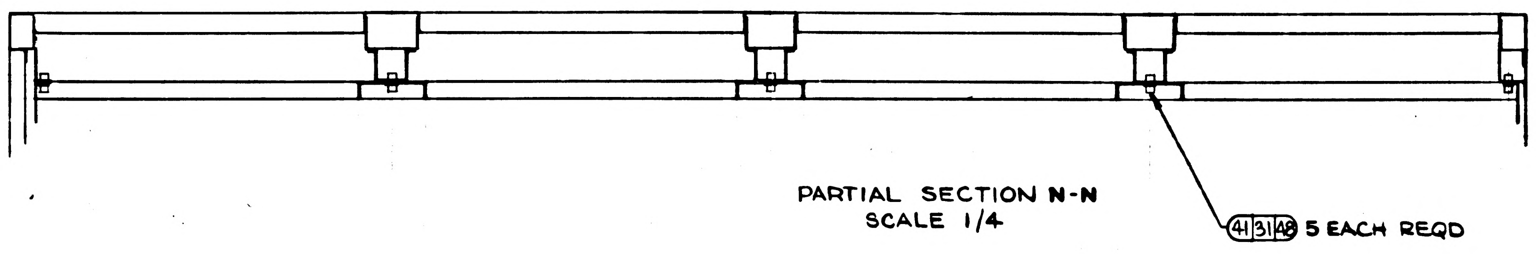
CABINET ASSEMBLY -
ELECTRICAL EQUIPMENT
OPTICS INERTIAL ANALYZER
ASSEMBLY

CODE IDENT NO. SIZE E 1900031

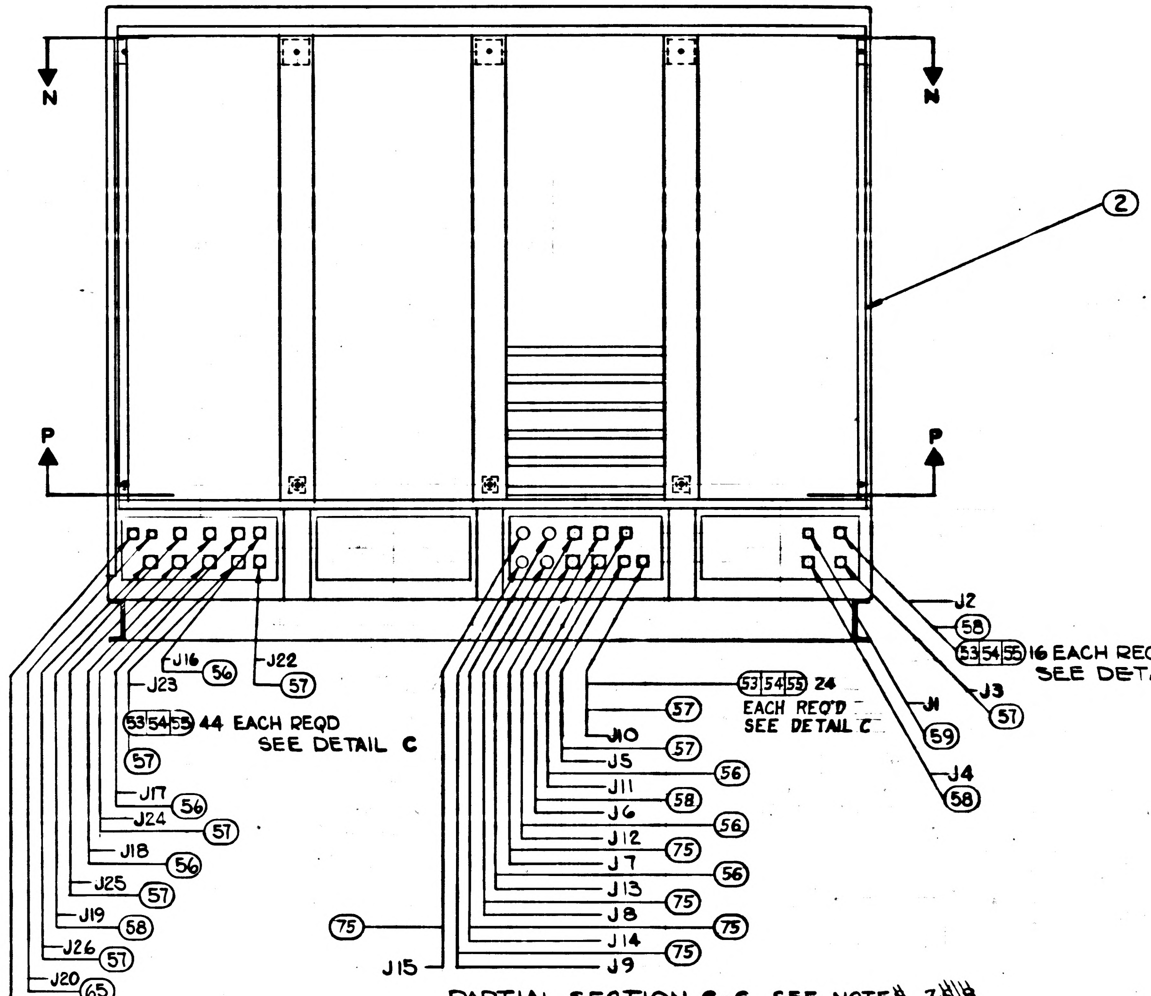
SCALE NOTED SHEET 2 OF 3

1900031 R

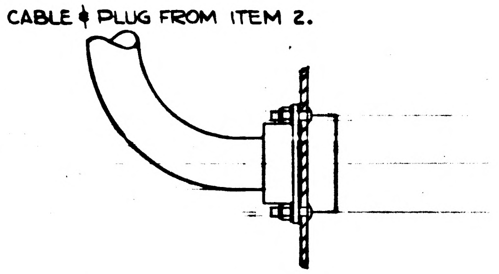
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271 TDRR 02580		30 JUL 63	C.A.M.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	AU
H		CHANGE IN ACCORDANCE WITH MXC 190242		20 SEP 63	
R	—	CHANGE IN ACCORDANCE WITH CM-193683 REVISE PER TDRR C7470		28-JAN-64	J.B.


41 31 48 5 EACH REQD

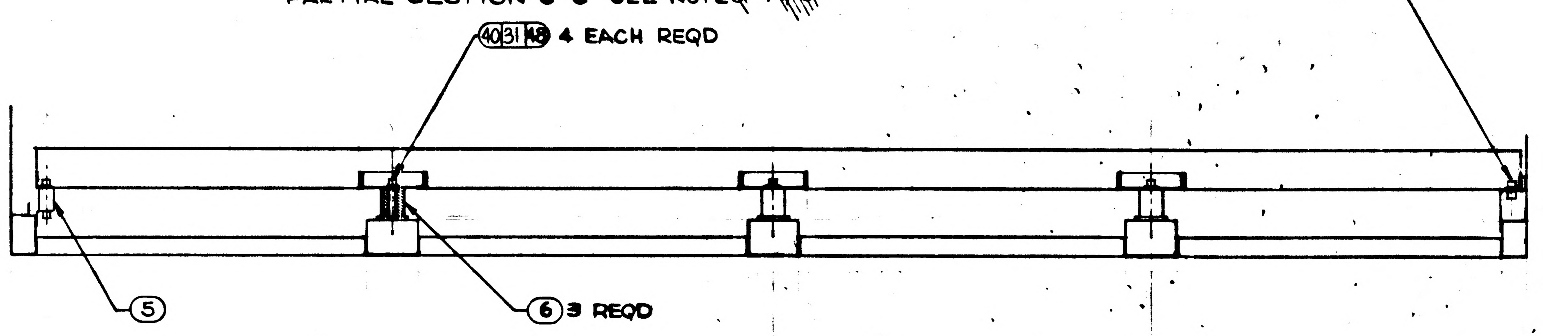
PARTIAL SECTION N-N
SCALE 1/4


N
N
P
P
2
J2
58
53 54 55 16 EACH REQD
SEE DETAIL C
J3
57
J1
59
J4
58
J16
56
J22
57
J23
53 54 55 44 EACH REQD
SEE DETAIL C
57
J17
56
J24
57
J18
56
J25
57
J19
58
J26
57
J20
65
J21
57
53 54 55 24
EACH REQ'D
SEE DETAIL C
57
J10
57
J5
56
J11
58
J6
56
J12
75
J7
56
J13
75
J8
75
J14
75
J9
75
J15

PARTIAL SECTION C-C SEE NOTES 7 & 8


CABLE & PLUG FROM ITEM 2.

DETAIL C
INSTALLATION OF J1 THRU J6, J10 THRU J13 & J16 THRU J26.


40 31 48 4 EACH REQD
41 31 48
5
6 3 REQD

PARTIAL SECTION P-P
SCALE 1/4

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02580 DATE AUG 63

Ⓓ THIS SHEET ADDED

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS +.02 −.02 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN P. Wagner DATE 14 JUNE 63
CHECKED E. Flemming 17 JULY 63
APPROVAL G. S[illegible] 63
APPROVAL [illegible] 8 AUG 63
NASA APPROVAL 8-14-63
MIT APPROVAL [illegible] AUG 63

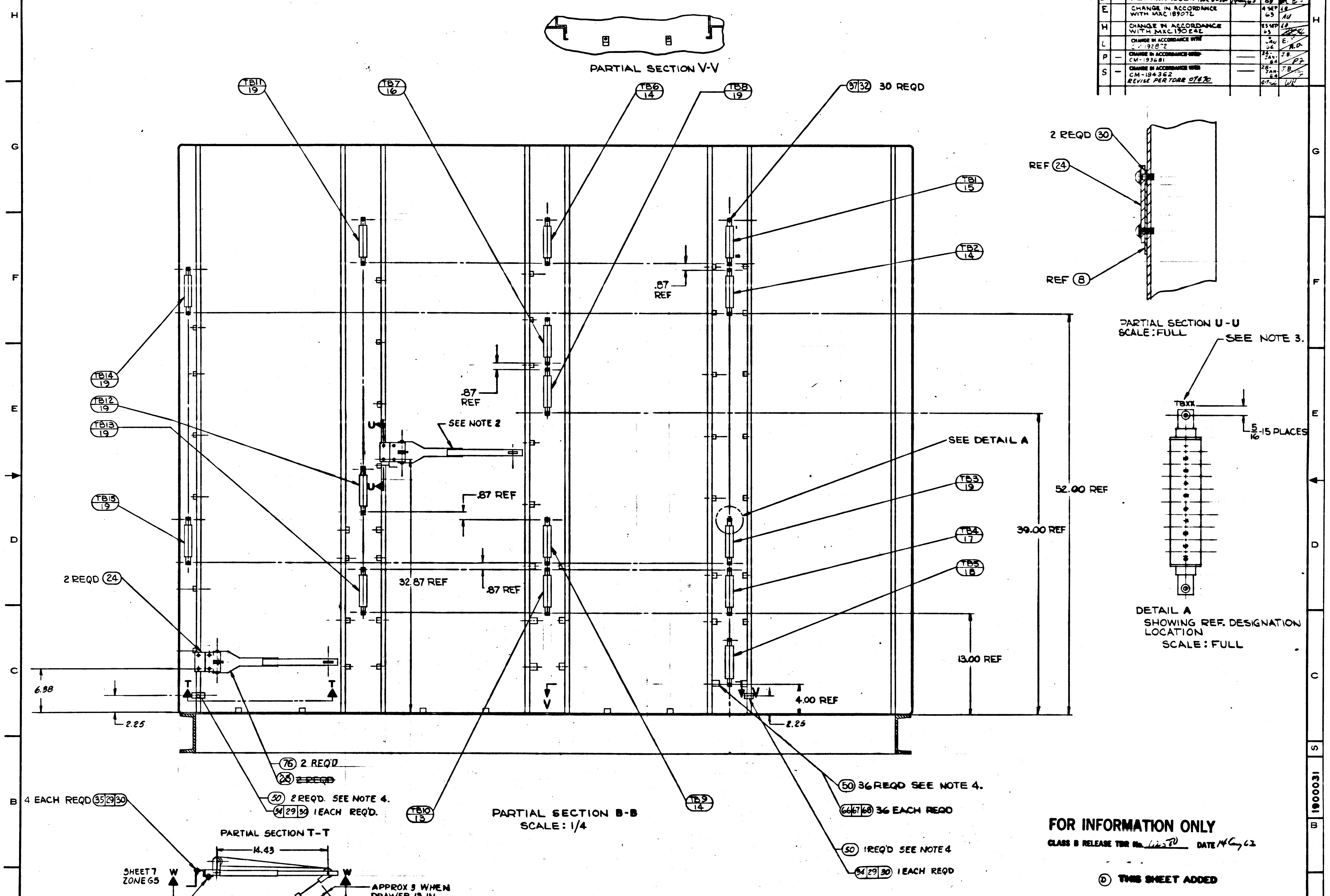
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY
ELECTRICAL EQUIPMENT
OPTICS-INERTIAL
ANALYZER ASSEMBLY

CODE IDENT NO. SIZE E 1900031
SCALE NOTED SHEET 3 OF 8

1900031 R

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271 TDRR 62580	14 May 63	30 JUL 63	C.A.M. E.J.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	AU
H		CHANGE IN ACCORDANCE WITH MXC190242		23 SEP 63	
L		CHANGE IN ACCORDANCE WITH CM 192872		JAN 64	E. R.D.
P	—	CHANGE IN ACCORDANCE WITH CM-193681	—	24-JAN-64	J.B.
S	—	CHANGE IN ACCORDANCE WITH CM-194362 REVISE PER TDRR 07470	—	28-JAN-64 4-7-64	J.B. WH


PARTIAL SECTION V-V
TB11 19
TB7 16
TB6 14
TB8 19
37 32 30 REQD
TB1 15
TB2 14
.87 REF
.87 REF
SEE NOTE 2
U
U
.87 REF
32.87 REF
.87 REF
TB14 19
TB12 19
TB13 19
TB15 19
2 REQD 24
6.38
2.25
T
T
V
V
4.00 REF
2.25
13.00 REF
39.00 REF
52.00 REF
SEE DETAIL A
TB3 19
TB4 17
TB5 18
2 REQD 30
REF 24
REF 8
PARTIAL SECTION U-U
SCALE: FULL
SEE NOTE 3.
TBXX
5/16-15 PLACES
DETAIL A
SHOWING REF. DESIGNATION LOCATION
SCALE: FULL
76 2 REQ'D
~~25 2 REQD~~
50 2 REQ'D. SEE NOTE 4.
34 29 30 1 EACH REQ'D.
TB10 13
PARTIAL SECTION B-B
SCALE: 1/4
TB9 14
50 36 REQD SEE NOTE 4.
66 67 68 36 EACH REQD
50 1 REQ'D SEE NOTE 4
34 29 30 1 EACH REQD
4 EACH REQD 35 29 30
PARTIAL SECTION T-T
14.43
SHEET 7 ZONE G5
W
W
APPROX 3 WHEN DRAWER IS IN CLOSED POSITION
50 29 30 33 SEE NOTE 4
4 EACH REQD 34 30 39

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 62580 DATE 14 May 63

Ⓓ THIS SHEET ADDED

NEXT ASSY | USED ON APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — — — DECIMALS +.02 −.02 ANGLES + — — — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN D.T. Wagner DATE 14 JUNE 63 CHECKED 17 JULY 63 APPROVAL 18 Jul 63 APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS CABINET ASSEMBLY ELECTRICAL EQUIPMENT OPTICS-INERTIAL ANALYZER ASSEMBLY	
	MATERIAL CONTRACT NAS9-497	NASA APPROVAL 5-14-63 MIT APPROVAL 14 May 63	CODE IDENT NO. SCALE NOTED	SIZE E 1900031 SHEET 4 OF 8

1900031

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. RELATED DRAWINGS:
   1900064 HARNESS & FRAME ASSY
   1900175 WIRING HARNESS 'A'
3. MARK CHARACTERS 1/8 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK.
4. SELECT ITEM 50, DASH NO.'S -2 THRU -40 AS REQUIRED AT ASSEMBLY.
5. $\boxed{C}$ REPRESENTS A CLOSED OPENING IN THE AIR PLENUM OF ITEM 1. OPENINGS SHALL BE CLOSED WITH PLATES SUPPLIED WITH ITEM 1 BY VENDOR IN ADDITION TO ITEM (73)
6. APPLY TIGHTENING TORQUE TO ALL SCREWS AS FOLLOWS:
   6-32 - 12-13 (IN. LBS)
   8-32 - 22-24 (IN. LBS)
   10-32 - 37-40 (IN. LBS)
   3/8 - 240-260 (IN. LBS)
7. CONNECTOR INSTALLATION:
   INSTALL J1 THRU J4 INCLUSIVE OF ② INTO ㉒ AS SHOWN.
   INSTALL J16 THRU J26 INCLUSIVE OF ② INTO ㊾ AS SHOWN.
   INSTALL J5 THRU J15 INCLUSIVE OF ② INTO (74) AS SHOWN.

~~8. CAUTION: ② CANNOT BE ASSEMBLED TO ① WITH PANEL MOUNTING J5 THRU J15 INCLUSIVE, ATTACHED.~~

9. AFTER ASSEMBLY OF ② TO ①, ATTACH RETRACTOR MOUNTED CABLES, OF ②, TO ⑫ IN THEIR RESPECTIVE AREAS.
10. ELECTRICAL REQUIREMENTS:
    AFTER INSTALLATION OF ② & ⑩ PER THEIR DRAWINGS, PERFORM THE FOLLOWING:
    A. CONTINUITY TEST - MEASURE ZERO $^{+1}_{-0}$ OHMS BETWEEN TERMINAL POINTS OF EACH CONDUCTOR.
    B. INSULATION RESISTANCE - WITH 500 $^{+0}_{-50}$ VDC APPLIED, READ A MINIMUM OF 200 MEG OHMS FROM CONDUCTOR TO GROUND AND FROM CONDUCTOR TO CONDUCTORS NOT ELECTRICALLY CONNECTED.
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
12. MARK CHARACTERS .38 HIGH PER ND 1002019 CENTRALIZE AS SHOWN, COLOR BLACK ~~(25 PLACES)~~
13. ADJUST ITEM ㉖ SO AS TO SUPPORT UNDER SIDE OF ITEMS ㉘ & (62).
14. DISPOSE OF EXCESS DRAWER MOUNTING AND RETRACTOR HARDWARE IN AN APPROVED MANNER.

NOTES (CONTINUED)

15. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267) AND SERIALIZE PER ND1002023.

SECTIONS APPEAR ON SHEETS AS FOLLOWS:

A-A	SHT 3
B-B	SHT 4
C-C	SHT 5
D-D	SHT 2
E-E	SHT 6
F-F	SHT 6
G-G	SHT 6
H-H	SHT 6
J-J	SHT 7
K-K	SHT 7
L-L	SHT 7
M-M	SHT 7
N-N	SHT 5
P-P	SHT 5
R-R	SHT 3
S-S	SHT 3
T-T	SHT 4
U-U	SHT 4
V-V	SHT 4
W-W	SHT 6
X-X	SHT 7
Y-Y	SHT 6
Z-Z	SHT 2

DETAILS:

A	SHT 4
B	SHT 3
C	SHT 5
D	SHT 7

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
ⓓ D		REPLACES REVISION "C" WITH CHANGE PER MXC 188871	TDRR 02580	30 JUL 63	C.A.M. / EF
				14 AUG 63	WR
E		CHANGE IN ACCORDANCE WITH MXC 189072		3 SEP 63	J.Q. / AU
-	-	ADDED CUSTOMERS DATA (V 6-63)	—	4 SEP 63	J.Q. / AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	J.Q. / AU
G	-	CHANGE IN ACCORDANCE WITH MXC 189686	—	9 SEP 63	J.J.J. / AU
H	-	CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	J.Q.
J	-	CHANGE IN ACCORDANCE WITH MXC 191867	—	6 NOV 63	WBM / PM
K		CHANGE IN ACCORDANCE WITH CM 192872		10 JAN 64	E.M. / R.D.
L		REVISION STATUS CHANGED PER CM 92872		10 JAN 64	E.M. / R.D.
M		REVISION STATUS CHANGED PER CM 193187		13 JAN 64	E.M. / E.H.
N		ITEM 15 WAS 1015918-109 PER CM 193580		14 JAN 64	E.M. / E.H.
P	-	CHANGE IN ACCORDANCE WITH CM-193681		24 JAN 64	J.B. / PJ
R	-	CHANGE IN ACCORDANCE WITH CM-193683		28 JAN 64	J.B. / PJ
S	-	CHANGE IN ACCORDANCE WITH CM-194362		28 JAN 64	J.B. / PJ
T	-	CHANGE IN ACCORDANCE WITH CM-194739 REVISE PER TDRR 0747C		3 FEB 64 / 4-7-64	PJ / WR

SHEET 1	SHEET 2	SHEET 3	SHEET 4	SHEET 5	SHEET 6	SHEET 7	SHEET 8
T	R	T	S	R	L	P	L
S	R	L	S	R	L	P	L
R	R	L	P	R	L	P	L
P	M	L	P	H	L	P	L
N	M	L	L	H	L	L	L
M	M	L	L	H	L	L	L
L	L	L	L	H	L	L	L
K	H	D	H	H	K	K	K
J	H	D	H	H	D	E	E
H	H	D	H	H	D	E	E
G	G	D	E	E	D	E	E
F	F	D	E	E	D	E	E
E	E	D	E	E	D	E	E
D	D	D	D	D	D	D	D

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0258D DATE 14 Aug 63

Ⓓ REPLACES REV (C) WITH CHANGE

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
NOTE 11	2		76	1015800-001	CABLE RETRACTOR
	5		75	1900369	GASKET - CONNECTOR
	1		74	1900365	PANEL ASS'Y (INSEP)
NOTE 5	17		73	1901346	PLATE, CLOSURE
	21		72	1006783-29	SCREW-BUTTON-HEX. SOC.
	42		71	AN363C832 (1896990-281)	NUT, SELF LOCKING
	12		70	MS-35234-60	SCREW, PAN HEAD
	2		69	1900973	DEFLECTOR, AIR
	36		68	AN960C8L (1897006-038)	WASHER, FLAT
NOTE 11	36		67	1006783-27	SCREW-BUTTON-HEX SOC
	36		66	MS35338-80	WASHER-LOCK
	1		65	1900368-009	GASKET-CONNECTOR
	1		64	1900569	STORAGE DRAWER ASSY
	1		63	1900568	STORAGE DRAWER ASSY
	2		62	1900345-021	WRITING SURFACE ASSY
	1		61	1900550	GROUND PLATE
	~~2~~		~~60~~	~~1900369~~	~~GASKET-CONNECTOR~~
	1		59	1900368-001	GASKET-CONNECTOR
	4		58	1900368-003	GASKET-CONNECTOR
	9		57	1900368-004	GASKET-CONNECTOR
	6		56	1900368-005	GASKET-CONNECTOR
	84		55	AN363C632 (1896990-261)	NUT, SELF LOCKING
	84		54	AN960C6L (1897006-036)	WASHER, FLAT #6
NOTE 11	84		53	1006783-23	SCREW-BUTTON-HEX. SOC.
			52		
			51		
	55		50	MS21919WDG-2 THRU -15 1897073-202 THRU -215	CLAMP, LOOP TYPE
	1		49	1900379	PANEL (INSEP) ASSY
	11		48	AN960C616 (1897006-062)	WASHER, FLAT
	1		47	1900309-011	PANEL ASSY, SWITCH BOX COMP
			46		
			45		
	2		44	1900364-031	BLANK PANEL ASSY 7
	1		43	1900364-021	BLANK PANEL ASSY 5 1/4
	1		42	MS171492	PIN
	6		41	MS16995-79	SCREW, SOC HD CAP
	4		40	MS16995-86	SCREW, SOC HD CAP
	8		39	AN363C1032 (1896990-011)	NUT, SELF LOCKING
	2		38	AN335-6	NUT-HEX
NOTE 11	30		37	1006783-21	SCREW, BUTTON HD-HEX SOC
	4		36	-46	
	55		35	-45	
	80		34	-44	
NOTE 11	13		33	1006783-43	SCREW, BUTTON HD-HEX. SOC
	30		32	MS35338-79	WASHER-LOCK #6
	12		31	MS35338-84	WASHER-LOCK 3/8
	126		30	AN960C10L (1897006-019)	WASHER, FLAT #10
	148		29	MS-35338-81	WASHER-LOCK #10
	~~1~~		~~28~~	~~1900345-011~~	~~WRITING SURFACE ASSY~~
	4		27	1900344	NUT BAR
	4		26	1900343	BRACKET
NOTE 11	6		25	1015790-001	NUT BAR
	2		24	1900277	BRACKET
~~NOTE 11~~	~~2~~		~~23~~	~~1015800~~	~~CABLE RETRACTOR~~
	1		22	1900380	PANEL (INSEP) ASSY
	1		21	1900255-011	LATCH ASSY
	1		20	1900080	STUD-GROUND
	7		19	1015918-102	TERMINAL BLOCK ASSY
	1		18	-103	
	1		17	-104	
	1		16	-108	
	1		15	-118	
	3		14	-110	
	1		13	1015918-112	TERMINAL BLOCK ASSY
	29		12	1015991-001	SCREW, HANGER
NOTE 11	4		11	1015819-001	AIR FILTER ASSY, SPECIAL
	1		10	1900175	WIRING HARNESS 'A'
	4		9	1900308	GUIDE
	4		8	1900303	SUPPORT BRACKET R.H.
	2		7	1900304	SUPPORT BRACKET L.H.
	3		6	1900307	SPACER
	1		5	1900198	SPACER
	1		4	1900306	BAR-STOP
	1		3	1900305	SUPPORT SHEET
	1		2	1900064	HARNESS FRAME ASSY
	1		1	1900007	CABINET ASSY, BASIC

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900C04-011	1900C04-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ –	+.02	+ –
– –	-.02	– –

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN P. Wiering DATE 14 June 63
CHECKED E. Fleming 17 July 63
APPROVAL G. Spencer
APPROVAL Coleman
7-12-63
NASA APPROVAL
MIT APPROVAL

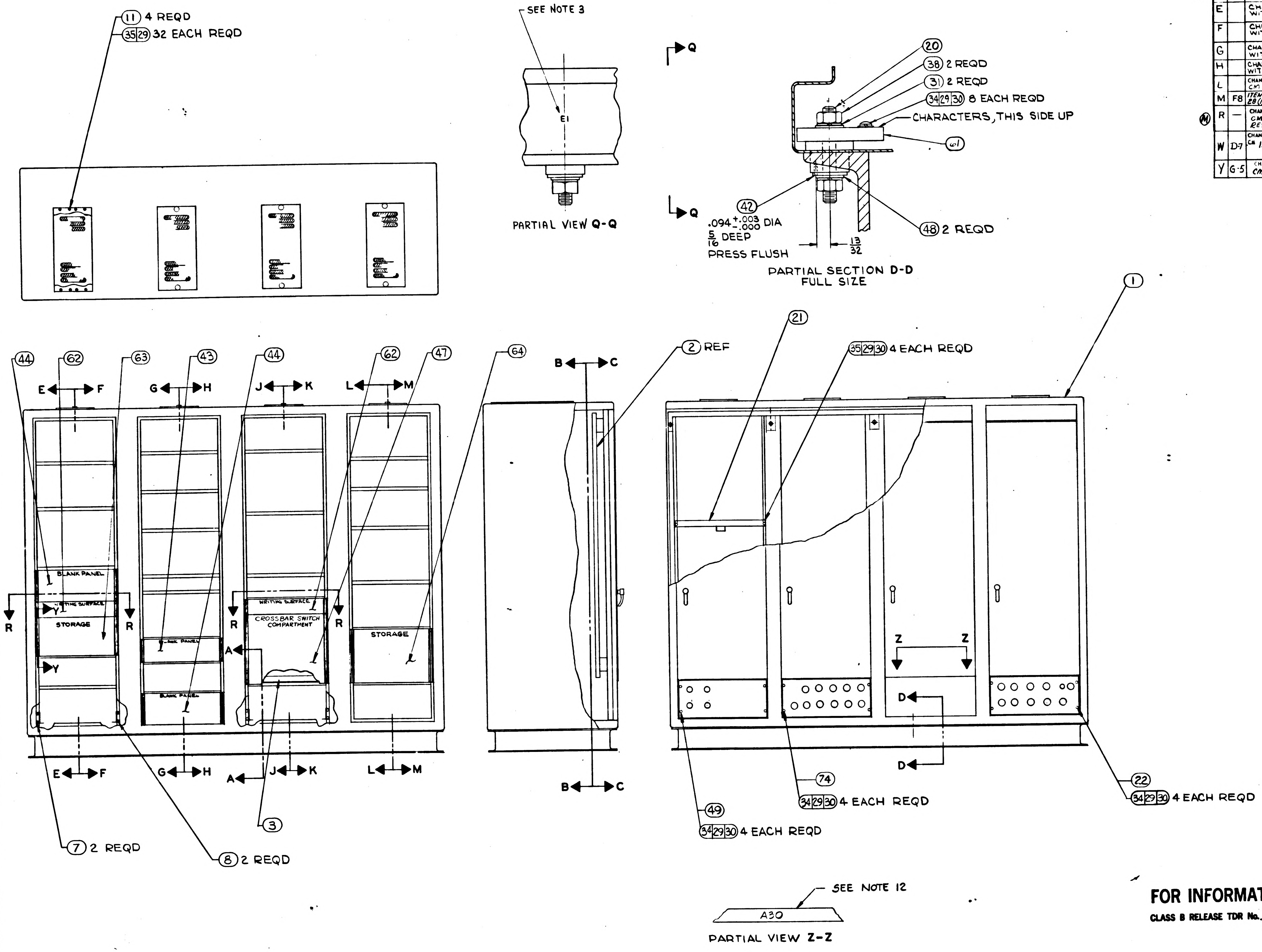
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY - ELECTRICAL EQUIPMENT OPTICS - INERTIAL ANALYZER ASSEMBLY

CODE IDENT NO.
SIZE E
1900031

SCALE NOTED
SHEET 1 OF 8

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		THIS SHEET ADDED PER MXC 188271 TDRR 02580	14 AUG	30 JUL 63	C.A.M.
E		CHANGE IN ACCORDANCE WITH MXC 189072		4 SEP 63	AU
F		CHANGE IN ACCORDANCE WITH MXC 189523		6 SEP 63	AU
G		CHANGE IN ACCORDANCE WITH MXC 189686		9 SEP 63	J.J.J.
H		CHANGE IN ACCORDANCE WITH MXC 190242		23 SEP 63	
L		CHANGE IN ACCORDANCE WITH CM 192872		10 JAN 64	E M R.D.
M	F8	ITEM 62 (1)1900345-021 WAS ITEM 28 (1)1900345-011 PER CM 193187		13 JAN 64	EM
R	—	CHANGE IN ACCORDANCE WITH CM-193683 REVISE PER TDRR 07410		28-JAN-64 4-7-64	J.B. WK
W	D-7	CHANGE IN ACCORDANCE WITH CM 195957		28 MAY 64	BK CP
Y	G-5	CHANGE IN ACCORDANCE WITH CM 196077		2 JUN 64	FL


11 4 REQD
35 29 32 EACH REQD
SEE NOTE 3
E1
PARTIAL VIEW Q-Q
Q
Q
20
38 2 REQD
31 2 REQD
34 29 30 8 EACH REQD
CHARACTERS, THIS SIDE UP
61
42
.094 +.003 −.000 DIA
5/16 DEEP
PRESS FLUSH
13/32
48 2 REQD
PARTIAL SECTION D-D
FULL SIZE
1
44
62
63
43
44
62
47
64
2 REF
21
35 29 30 4 EACH REQD
E F
G H
J K
L M
B C
BLANK PANEL
WRITING SURFACE
STORAGE
Y
Y
R
R
BLANK PANEL
BLANK PANEL
A
WRITING SURFACE
CROSSBAR SWITCH COMPARTMENT
STORAGE
Z Z
D
D
E F
G H
A J K
L M
B C
3
7 2 REQD
8 2 REQD
49
34 29 30 4 EACH REQD
74
34 29 30 4 EACH REQD
22
34 29 30 4 EACH REQD
SEE NOTE 12
A30
PARTIAL VIEW Z-Z

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 025TU **DATE** 14 Aug 63

Ⓓ **THIS SHEET ADDED**

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ −	+.02	+ −
− −	−.02	− −

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Wagner DATE 14 JUNE 63
CHECKED E Flemming 7 JULY 63
APPROVAL G. Stoddard 16 July 63
APPROVAL [illegible] 7/19/63
NASA APPROVAL 8-14-63
MIT APPROVAL 14 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CABINET ASSEMBLY -
ELECTRICAL EQUIPMENT
OPTICS INERTIAL ANALYZER
ASSEMBLY

CODE IDENT NO. SIZE E 1900031
SCALE NOTED SHEET 2 OF 8

1900031

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D2		CHANGE IN ACCORDANCE WITH MXC-186592		22 MAY 63	M.G. P.F.
E		CHANGE IN ACCORDANCE WITH MXC- 187697	TDRR 03230 19SEP63	2 JUL 63	JLC ARS

REQUIREMENTS (CONTINUED):

"CLOCK FREQUENCY DIVIDER": A 6-POSITION ROTARY SWITCH WHICH DIVIDES THE INTERNAL (100 KC) CLOCK AND THE "C" INPUT BY ONE OF FOLLOWING FACTORS "1", "10", "10^2", "10^3", "10^4", "10^5". WHEN USING THE INTERNAL CLOCK THE GATE OPEN PERIOD MAY THEN BE EXTENDED TO THE FOLLOWING TIMES: 10 SEC, 100 SEC, 1000 SEC, 10,000 SEC, & 100,000 SEC.

INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.

"ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).

"TRIGGER-VOLTAGE" - "+" "-": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.

"SLOPE" CONTROL "+" & "-": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.

"RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.

"POWER-ON": TOGGLE SWITCH.

"CLOCK SELECTOR": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.

"A" INPUT:

COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.

SENSITIVITY: 100 MV RMS.

IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

"B" INPUT:

COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.

SENSITIVITY: 100 MV RMS.

IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

"C" INPUT:

INPUT RATE: 10 CPS TO 100 KC.
INPUT RANGE: 1 VOLT TO 28 VOLTS RMS
SENSITIVITY: 1 VOLT RMS.

IMPEDANCE: 1.00 KΩ MIN.

"D" INPUT:
COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC

SENSITIVITY: 100 MV RMS

IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

REQUIREMENTS (CONTINUED): (N)

CONNECTOR OUTPUTS:

DIGITS: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION, $-.2^{+.3}_{-.1}$ VOLTS FOR BINARY "1" & -12.5 ± 1 VOLT FOR BINARY "0" OUTPUT IMPEDANCE 100KΩ ±10%. OUTPUT CURRENT 50 MICRO AMPS MAX.

PRINT COMMAND: A DC CHANGE FROM BINARY "1" TO BINARY "0" SHALL BE AVAILABLE WHEN THE COUNT GATE CLOSES. 35 KΩ OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA.

POLARITY COMMAND: A BINARY "0" SHALL REPRESENT A "+" POLARITY AND A BINARY "1" SHALL REPRESENT A "–" POLARITY. -12.5 ± 1 VOLT FOR BINARY "0". $-.2^{+.3}_{-.1}$ VOLT FOR BINARY "1". OUTPUT IMPEDANCE 1KΩ ± 5% OUTPUT CURRENT 1 MA MAX.

COLOR COMMAND: A BINARY "0" SHALL BE AVAILABLE TO PRODUCE A BLACK PRINTOUT ON THE PRINTER.

IN "RATIO OR PERIOD", "E/UT X N_1" "TEST N_1" & "TEST N_2" THE COUNTER SHALL BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2MA MAX.

REMOTE RESET: A REMOTE RESET SHALL BE BROUGHT OUT IN PARALLEL WITH THE FRONT PANEL RESET.

"N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) μS WIDE WITH 0.5 μS RISE. OUTPUT IMPEDANCE 1KΩ REFERENCED TO -15V.

"N_2" TIME BASE OUTPUT: BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12.5 ± 2.5V POS. PULSE 5(±1) μS WIDE WITH 0.5 μS RISE. OUTPUT IMPEDANCE 1KΩ REFERENCED TO -15V.

INDICATORS:

6 DIGITS COLUMNAR. DISPLAY INDICATES ACCUMULATED COUNT.

"+" AND "-" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.

"GATE": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.

POWER REQUIREMENTS: 115 AC LINE ±10% 60 ± 5 CPS APPROXIMATELY 100 WATTS.

CLOCK STABILITY: THE INTERNAL CLOCK (100 KC ± 1 CPS) SHALL HAVE A STABILITY OF 2 PARTS IN 10^7 PER DAY AND 5 PARTS IN 10^7 PER WEEK

OSC TEST:

THE INTERNAL CLOCK (100 KC) SHALL BE BROUGHT OUT TO J5 OSC TEST JACK.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. D0995 DATE 24 Apr 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Rounds 24 JAN 63
APPROVAL M. H. Hansen 25 JAN 63
APPROVAL A. Kodel 25 JAN 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

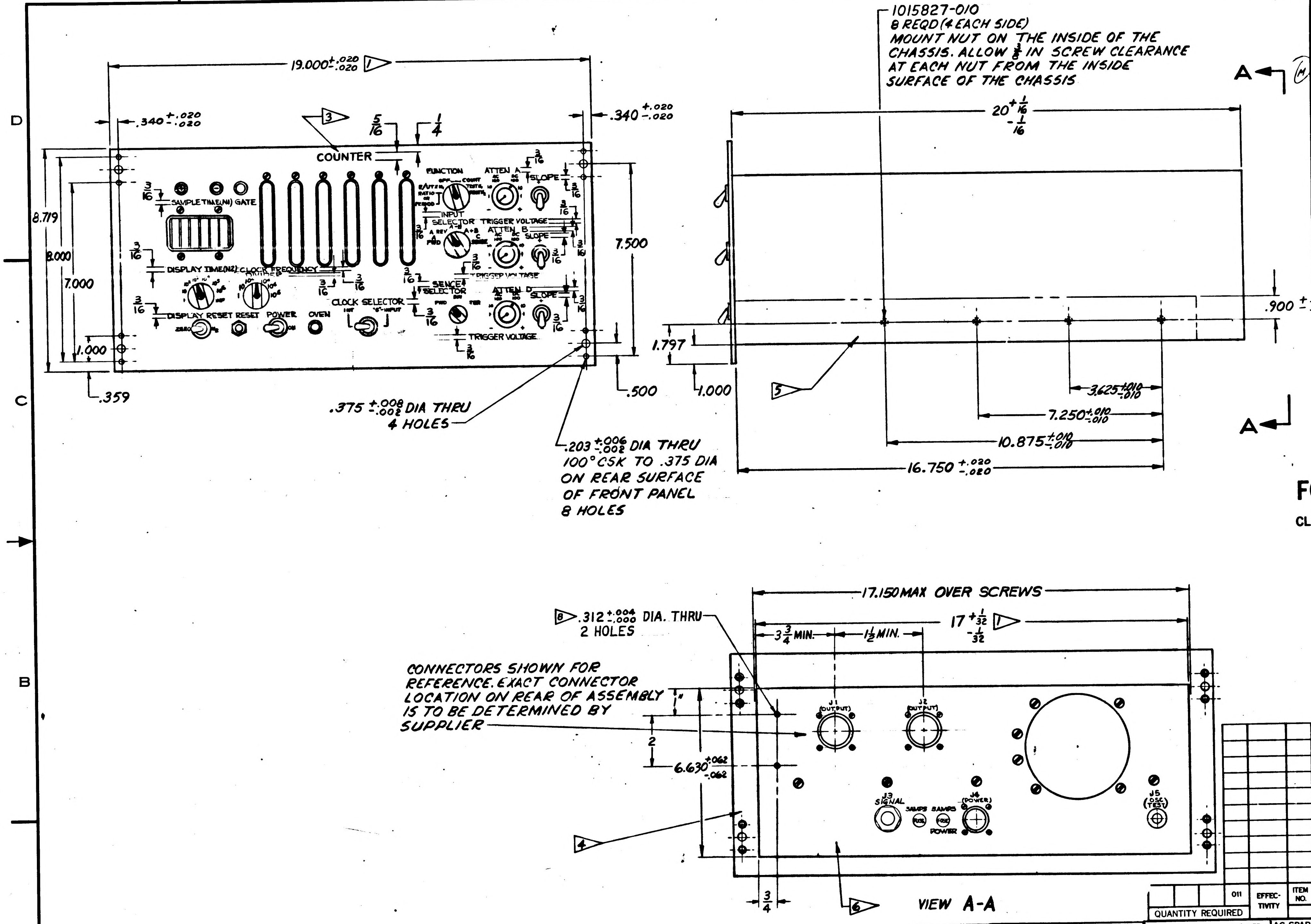
CODE IDENT NO.
SIZE D 1900032
SCALE —
SHEET 3 OF 4

MIL 10770—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900032 G

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		REVISED & REDRAWN		25 JAN 63	
D		REVISED	DO 51352	4 MAR 63	RWY WD
D_1		CHANGE IN ACCORDANCE WITH MXC-186088		2-MAY-63	J.B.
D_2		CHANGE IN ACCORDANCE WITH MXC-186592		22 MAY -63	M.G. P.F.
E		CHANGE IN ACCORDANCE WITH MXC- 187697		2 JUL 63	JLC LARS
F		CHANGE IN ACCORDANCE WITH MXC-188649		5 AUG 63	JLC
G		CHANGE IN ACCORDANCE WITH MXC 189485	TDRR 03230	5 SEP 63	JGL
			"	19 SEP 63	WR.


19.000 +.020 -.020 ▷1
.340 +.020 -.020
.340 +.020 -.020
▷3
5/16
1/4
COUNTER
FUNCTION
ATTEN A
SLOPE
SAMPLE TIME(N1) GATE
INPUT SELECTOR
TRIGGER VOLTAGE
ATTEN B
SLOPE
DISPLAY TIME(N2)
CLOCK FREQUENCY DIVIDER
SENCE SELECTOR
TRIGGER VOLTAGE
ATTEN D
SLOPE
CLOCK SELECTOR
DISPLAY RESET
RESET
POWER
OVEN
TRIGGER VOLTAGE
3/16
8.719
8.000
7.000
1.000
.359
7.500
.500
1.000
1.797
.375 +.008 -.002 DIA THRU
4 HOLES
.203 +.006 -.002 DIA THRU
100° CSK TO .375 DIA
ON REAR SURFACE
OF FRONT PANEL
8 HOLES
1015827-010
8 REQD (4 EACH SIDE)
MOUNT NUT ON THE INSIDE OF THE CHASSIS. ALLOW 1/8 IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS
A
A
20 +1/16 -1/16
.900 +.020 -.020
▷5
3.625 +.010 -.010
7.250 +.010 -.010
10.875 +.010 -.010
16.750 +.020 -.020
17.150 MAX OVER SCREWS
▷8 .312 +.004 -.000 DIA. THRU
2 HOLES
3 3/4 MIN.
1 1/2 MIN.
17 +1/32 -1/32 ▷7
CONNECTORS SHOWN FOR REFERENCE. EXACT CONNECTOR LOCATION ON REAR OF ASSEMBLY IS TO BE DETERMINED BY SUPPLIER
2
6.630 +.062 -.062
J1 (OUTPUT)
J2 (OUTPUT)
J3 SIGNAL
J4 (POWER)
J5 (OSC TEST)
FUSE
POWER
▷4
3/4
▷6
VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00948 DATE 24 Apr 63

G	G	E	G
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011			TO BE ASSIGNED	EPUT METER (MODEL NO. 3350/6)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Ramsdale 24 JAN 63
APPROVAL W. Munson 25 JAN 63
APPROVAL 25 JAN 63
NASA APPROVAL 4/24/63
J.P. 4-24-63
MIT APPROVAL WR 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.
SIZE D
1900032
SCALE —
SHEET 1 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		CHANGE IN ACCORDANCE WITX MXC 189485	TDRR 03230	5 SEP 63	JGL

REQUIREMENTS:

ELECTRICAL SPECIFICATIONS:

"INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:

"A FWD": INPUT (2 MC MAX.) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.

"A REV": "A" INPUT (100 KC MAX.) IS COUPLED TO THE "FUNCTION" SWITCH. COUNTING IS FORWARD ONLY BUT THE "–" POLARITY LAMP IS LIT.

"A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 50 μS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.

"A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 20 μS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.

"C-SENSE": THE INTERNAL (100KC) CLOCK IS COUPLED TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.

"FUNCTION" ROTARY SWITCH WITH THE FOLLOWING POSITIONS:

"RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 μS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES THE INTERNAL (100KC) CLOCK AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C-SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION.

"EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT-GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT-ACCUMLATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE INTERNAL (100KC) CLOCK AFTER WHICH THE INSTRUMENT AUTOMATICALLY RESETS AND RECYCLES.

"TEST N_1": THE INTERNAL (100 KC) CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.

OFF: SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE WHICH IS HELD PERMANENTLY CLOSED & NO COUNTS ARE ACCUMULATED.

REQUIREMENTS (CONTINUED):

"TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 PULSES FROM THE "CLOCK FREQUENCY DIVIDER".

"COUNT"} : SIGNALS FROM THE INPUT SELECTOR ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED COUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET BUTTON ONLY.

"SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999".

"DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS:- "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" & "INF." (INFINITE DISPLAY TIME WITH MANUAL RESET).

"DISPLAY RESET": EXCEPT IN THE "TEST", "OFF", & "COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE INTERNAL CLOCK (100KC). AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS (EXCEPT IN THE "INF" POSITION) AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT-PANEL ROTARY SWITCH.

"ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.

"N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.

*ON 10^6 POSITION COUNTER RESETS TO ZERO.

"SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.

"FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" & "B" INPUT CONDITIONS.

"BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12 V).

"TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" & "B" INPUT CHANNELS, AS FOLLOWS:

IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.
WHEN "A" CHANNEL OUTPUT IS "1" & "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.
WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE IN REVERSE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Apr 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Remde 24 JAN 63
APPROVAL M. Y. Haver 25 JAN 63
APPROVAL 25 JAN 63
NASA APPROVAL 4/24/63
J. P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.
SIZE D
1900032
SCALE —
SHEET 2 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
G		CHANGE IN ACCORDANCE WITH MXC 189485	DRTC 63230	5 SEP 63 MSC	JGL

REQUIREMENTS (CONTINUED):

MECHANICAL SPECIFICATIONS:

TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.
THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP-1900032.

ALL KNOBS SHALL BE PER MS91528 TYPE F AND K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND-1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

FRONT PANEL MATERIAL: QQ-A-318, TEMPER H32, TYPE 5052 ALUMINUM $\frac{3}{16}$ THICK

1▷ 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY.
SIDES OF CHASSIS LOCATED BY 17 INCH DIM. SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.
FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595.

3▷ CHARACTERS PER ND-1002122
CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. ENGRAVE PER ND 1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157.
CENTRALIZE AS SHOWN.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

WEIGHT: NOT TO EXCEED 50 LBS.

4▷ BORDER AREA, WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

5▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.
SIGNAL INPUTS, CHASSIS AND POWER SOURCE SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.
DATA SOURCE:
BECKMAN INSTRUMENTS INC., BERKELEY DIV.,
RICHMOND, CALIF.
REVERSING EPUT METER MODEL 3350/6-6.

THE COUNTER SHALL BE ELECTRICALLY COMPATIBLE FOR SIMULTANEOUS USE WITH THE "INDICATOR, COUNTER, REMOTE" P/N. 1900020 AND PRINTER P/N. 1900063.

6▷ CONNECTOR INFORMATION

J5
OSC TEST
BNC UG-1094/U

J4 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL
A	CHASSIS
B	
C	
D	INPUT POWER HI
E	INPUT POWER LO
F	
G	
H	

J1 SIGNAL OUTPUT
MS3112E22-55S

PIN NO.	SIGNAL	
B	1	DIGIT 1 OR LSD
C	2	
D	4	
E	8	
A		
F		
G		
H	1	DIGIT 2
J	2	
K	4	
L	8	
M		
N		
P	1	DIGIT 3
R	2	
S	4	
T	8	
U		
V		
W	1	DIGIT 4
X	2	
Y	4	
Z	8	
a		
b	1	DIGIT 5
$\bar{c}$	2	
d	4	
e	8	
f		
g	1	DIGIT 6 MSD
h	2	
i	4	
j	8	

PIN NO.	SIGNAL	
$\bar{k}$	REMOTE RESET	
m	PRINT-OUT COLOR CONTROL	
n		
$\bar{p}$	SIGN INDICATOR; "0"=(+), "1"=(-)	
r	PRINT COMMAND, OR READOUT CONTROL	
$\bar{s}$	INHIBIT RESET (AN INPUT SIGNAL)	
t	SIGNAL GROUND	
u	DISPLAY OVER RIDE	
v	COMMON, SELECTOR SWITCH	
w	A FWD	SIGNALS FROM THE SELECTOR SWITCH
$\bar{x}$	A REV	
y	A−B	
z	A+B	
AA	C SENSE	
BB	COMMON, FUNCTION SWITCH	
EE	OFF	SIGNALS FROM THE FUNCTION SWITCH
FF	COUNT	
CC	RATIO OR PERIOD	
DD	EPUT × N_1	
GG	TEST N_1	
HH	TEST N_2	

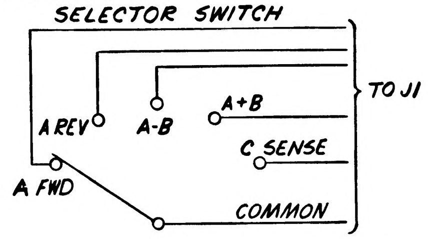
J2 SIGNAL OUTPUT
MS 3112E-22-55 SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS $\bar{k}$, m, n, $\bar{s}$, u, v, w, $\bar{x}$, y, z, AA, BB, CC, DD, EE, FF, GG, AND HH, ARE SPARES.

J3 SIGNAL INPUT
1015906-100 CONNECTOR (1 REQ'D)
1015908-21 SOCKET CONTACT (10 REQ'D)
1015908-41 OUTER MALE BODY (10 REQ'D)
1015908-51 HYRING (10 REQ'D)

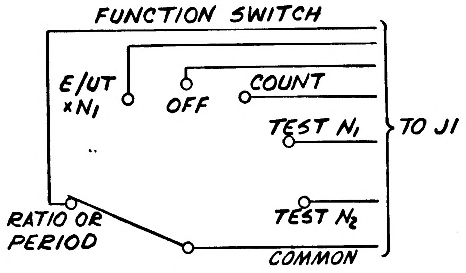
PIN NO.	SIGNAL
A	A INPUT
B	B INPUT
C	C INPUT
D	D INPUT
E	−15 V LOW
F	N_1 OUTPUT
G	N_2 OUTPUT
H	SIGNAL LOW
J	
K	

AUXILIARY DECKS SHALL BE ON THE "INPUT SELECTOR" AND "FUNCTION" SWITCHES OUTPUT LINES SHALL BE BROUGHT OUT FROM EACH DECK TO J1 AS SHOWN. THE SWITCH CONTACTS SHALL BE CAPABLE OF SWITCHING 28 VDC AT 0.5 AMPS.

SELECTOR SWITCH



FUNCTION SWITCH



8▷ ALLOW ½ INCH CLEARANCE BEHIND EACH HOLE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Jan 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Remde 24 JAN 63
APPROVAL W. Y. Hansen 25 JAN 63
APPROVAL A. Wodel 25 JAN 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Jan 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.
SIZE D
1900032
SCALE —
SHEET 4 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 1077D-P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		CHANGE IN ACCORDANCE WITX MXC 189485	TDRR 03230	5 SEP 63 KSG	JGL
H		REPLACED WITH CHANGE BY REV. J PER MXC 191663 REVISED PER TDR 08096		15 NOV 63	

REQUIREMENTS:

ELECTRICAL SPECIFICATIONS:

"INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:

"A FWD": INPUT (2 MC MAX.) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.

"A REV": "A" INPUT (100 KC MAX.) IS COUPLED TO THE "FUNCTION" SWITCH. COUNTING IS FORWARD ONLY BUT THE "–" POLARITY LAMP IS LIT.

"A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 50μS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.

"A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 20μS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.

"C-SENSE": THE INTERNAL(100KC)CLOCK IS COUPLED TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.

"FUNCTION", ROTARY SWITCH WITH THE FOLLOWING POSITIONS:

"RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 μS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES THE INTERNAL (100KC) CLOCK AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C-SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION.

"EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT-GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT-ACCUMLATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE INTERNAL (100KC) CLOCK AFTER WHICH THE INSTRUMENT AUTOMATICALLY RESETS AND RECYCLES.

"TEST N_1": THE INTERNAL (100 KC) CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.

OFF: SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE WHICH IS HELD PERMANENTLY CLOSED & NO COUNTS ARE ACCUMULATED.

REQUIREMENTS (CONTINUED):

"TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 PULSES FROM THE "CLOCK FREQUENCY DIVIDER".

"COUNT" } : SIGNALS FROM THE INPUT SELECTOR ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED COUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET, BUTTON ONLY.

"SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999".

"DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS:- "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" & "INF." (INFINITE DISPLAY TIME WITH MANUAL RESET).

"DISPLAY RESET": EXCEPT IN THE "TEST," "OFF, & "COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE INTERNAL CLOCK (100KC). AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS (EXCEPT IN THE "INF" POSITION) AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT-PANEL ROTARY SWITCH.

"ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.

"N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.

*ON 10^6 POSITION COUNTER RESETS TO ZERO.

"SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.

"FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" & "B" INPUT CONDITIONS.

"BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12 V).

"TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" & "B" INPUT CHANNELS, AS FOLLOWS:

IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.
WHEN "A" CHANNEL OUTPUT IS "1" & "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.
WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE IN REVERSE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00448 DATE 24Apr63

Ⓗ ACED WITH CHANGE BY REV J

NEXT ASSY	USED ON	APPLICABLE DASH NO.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —	AC SPARK PLUG DIVISION, GMC MILWAUKEE WISCONSIN ACSP PN SK44258	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
APPLICATION			DO NOT SCALE THIS DRAWING	DRAWN W. MUNSON DATE 17 JAN 63 CHECKED P. Remde 24 JAN 63 APPROVAL 25 JAN 63 APPROVAL 25 JAN 63	COUNTER
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES			MATERIAL —	NASA APPROVAL 4/24/63 4-24-63 MIT APPROVAL 24 Apr 63	CODE IDENT NO. — SIZE D — 1900032
			CONTRACT NAS9-497		SCALE — SHEET 2 OF 4

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D2		CHANGE IN ACCORDANCE WITH MXC-186592		22 MAY 63	M.G. P.F.
E		CHANGE IN ACCORDANCE WITH MXC- 187697	TDRR 03230 19SEP63	2 JUL 63	JLC LARS
H		REPLACED WITH CHANGE BY REV. J PER MXC 191663 REVISED PER TDR C8096		15 NOV 63	J. J.

REQUIREMENTS (CONTINUED):

"CLOCK FREQUENCY DIVIDER": A 6-POSITION ROTARY SWITCH WHICH DIVIDES THE INTERNAL (100 KC) CLOCK AND THE "C" INPUT BY ONE OF FOLLOWING FACTORS "1", "10", "10^2", "10^3" "10^4", "10^6". WHEN USING THE INTERNAL CLOCK THE GATE OPEN PERIOD MAY THEN BE EXTENDED TO THE FOLLOWING TIMES: 10 SEC, 100 SEC. 1000 SEC, 10,000 SEC. & 100,000 SEC.

INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.

"ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).

"TRIGGER-VOLTAGE" - "+" "-": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.

"SLOPE" CONTROL "+" & "-": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.

"RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.

"POWER-ON": TOGGLE SWITCH.

"CLOCK SELECTOR": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.

"A" INPUT:

COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.

SENSITIVITY: 100 MV RMS.

IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

"B" INPUT:

COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.

SENSITIVITY: 100 MV RMS.

IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

"C" INPUT:

INPUT RATE: 10 CPS TO 100 KC.
INPUT RANGE: 1 VOLT TO 28 VOLTS RMS
SENSITIVITY: 1 VOLT RMS.

IMPEDANCE: 1.00 K Ω MIN.

"D" INPUT:

COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC

SENSITIVITY: 100 MV RMS

IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

REQUIREMENTS (CONTINUED):

CONNECTOR OUTPUTS:

DIGITS: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION, $-.2^{+.3}_{-.1}$ VOLTS FOR BINARY "1" & -12.5 ± 1 VOLT FOR BINARY "0" OUTPUT IMPEDANCE 100 K Ω ±10%. OUTPUT CURRENT 50 MICRO AMPS MAX.

PRINT COMMAND: A DC CHANGE FROM BINARY "1" TO BINARY "0" SHALL BE AVAILABLE WHEN THE COUNT GATE CLOSES. 35 K Ω OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA.

POLARITY COMMAND: A BINARY "0" SHALL REPRESENT A "+" POLARITY AND A BINARY "1" SHALL REPRESENT A "−" POLARITY. -12.5 ± 1 VOLT FOR BINARY "0". $-.2^{+.3}_{-.1}$ VOLT FOR BINARY "1". OUTPUT IMPEDANCE 1K Ω ± 5% OUTPUT CURRENT 1 MA MAX.

COLOR COMMAND: A BINARY "0" SHALL BE AVAILABLE TO PRODUCE A BLACK PRINTOUT ON THE PRINTER.

IN RATIO OR PERIOD", "E/UT X N_1" "TEST N_1" & "TEST N_2" THE COUNTER SHALL BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2MA MAX.

REMOTE RESET: A REMOTE RESET SHALL BE BROUGHT OUT IN PARALLEL WITH THE FRONT PANEL RESET.

"N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1K Ω REFERENCED TO -15 V.

"N_2" TIME BASE OUTPUT: BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5(±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1K Ω REFERENCED TO -15 V.

INDICATORS:

6 DIGITS COLUMNAR. DISPLAY INDICATES ACCUMULATED COUNT.

"+" AND "-" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.

"GATE": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.

POWER REQUIREMENTS: 115 AC LINE ±10% 60 ± 5 CPS APPROXIMATELY 100 WATTS.

CLOCK STABILITY: THE INTERNAL CLOCK (100 KC ± 1 CPS) SHALL HAVE A STABILITY OF 2 PARTS IN 10^7 PER DAY AND 5 PARTS IN 10^7 PER WEEK

OSC TEST:

THE INTERNAL CLOCK (100 KC) SHALL BE BROUGHT OUT TO J5 OSC TEST JACK.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 20998 **DATE** 24 Apr 63

Ⓗ **REPLACED WITH CHANGE BY REV J**

			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN SK 44258	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
			DO NOT SCALE THIS DRAWING	DRAWN W. MUNSON DATE 17 JAN 63 CHECKED P. Rounds 24 JAN 63 APPROVAL M. H. Hansen 25 JAN 63 APPROVAL A. Hodel 25 JAN 63	COUNTER
NEXT ASSY	USED ON	APPLICABLE DASH NO.	MATERIAL —	NASA APPROVAL 4/24/63 J P Gilmore 4-24-63	CODE IDENT NO.
APPLICATION					SIZE D 1900032
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES			CONTRACT NAS 9-497	MIT APPROVAL 24 Apr 63	SCALE — SHEET 3 OF 4

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
G		CHANGE IN ACCORDANCE WITH MXC 189485	03230	5 SEP 63	JGL
H		REPLACED WITH CHANGE BY REV. J PER MXC 191663 REVISED PER TDR 08096		15 NOV 63	J.J.

REQUIREMENTS (CONTINUED):

MECHANICAL SPECIFICATIONS:

TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.
THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP-1900032.

ALL KNOBS SHALL BE PER MS91528 TYPE F AND K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND-1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

FRONT PANEL MATERIAL: QQ-A-318, TEMPER H32, TYPE 5052 ALUMINUM $\frac{3}{16}$ THICK

1▷ 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY.
SIDES OF CHASSIS LOCATED BY 17 INCH DIM. SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062.
FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY. COLOR 26440 OF FED STD 595.

3▷ CHARACTERS PER ND-1002122
CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. ENGRAVE PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157.
CENTRALIZE AS SHOWN.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

WEIGHT: NOT TO EXCEED 50 LBS.

4▷ BORDER AREA, WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

5▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.
SIGNAL INPUTS, CHASSIS AND POWER SOURCE SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.
DATA SOURCE:

BECKMAN INSTRUMENTS INC., BERKELEY DIV.,
RICHMOND, CALIF.
REVERSING EPUT METER MODEL 3350/6-6.

THE COUNTER SHALL BE ELECTRICALLY COMPATIBLE FOR SIMULTANEOUS USE WITH THE "INDICATOR, COUNTER, REMOTE" P/N. 1900020 AND PRINTER P/N. 1900063.

6▷ CONNECTOR INFORMATION

J5
OSC TEST
BNC UG-1094/U

J4 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL
A	CHASSIS
B	
C	
D	INPUT POWER HI
E	INPUT POWER LO
F	
G	
H	

J1 SIGNAL OUTPUT
MS3112E22-55S

PIN NO.	SIGNAL	
B	1	DIGIT 1 OR LSD
C	2	
D	4	
E	8	
A		
F		
G		
H	1	DIGIT 2
J	2	
K	4	
L	8	
M		
N		
P	1	DIGIT 3
R	2	
S	4	
T	8	
U		
V		
W	1	DIGIT 4
X	2	
Y	4	
Z	8	
a		
b	1	DIGIT 5
c̄	2	
d	4	
e	8	
f		
g	1	DIGIT 6 MSD
h	2	
i	4	
j	8	

PIN NO.	SIGNAL	
k̄	REMOTE RESET	
m	PRINT-OUT COLOR CONTROL	
n		
p̄	SIGN INDICATOR; "0"=(+), "1"=(-)	
r	PRINT COMMAND, OR READOUT CONTROL	
s̄	INHIBIT RESET (AN INPUT SIGNAL)	
t	SIGNAL GROUND	
u	DISPLAY OVER RIDE	
v	COMMON, SELECTOR SWITCH	
w	A FWD	SIGNALS FROM THE SELECTOR SWITCH
x̄	A REV	
y	A−B	
z	A+B	
AA	C SENSE	
BB	COMMON, FUNCTION SWITCH	
EE	OFF	SIGNALS FROM THE FUNCTION SWITCH
FF	COUNT	
CC	RATIO OR PERIOD	
DD	EPUT × N_1	
GG	TEST N_1	
HH	TEST N_2	

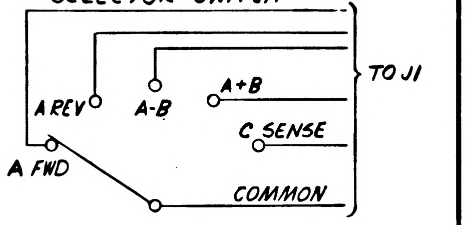
J2 SIGNAL OUTPUT
MS 3112E-22-55SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS k̄, m, n, s̄, u, v, w, x̄, y, z, AA, BB, CC, DD, EE, FF, GG, AND HH, ARE SPARES.

J3 SIGNAL INPUT
1015906-100 CONNECTOR (1 REQ'D)
1015908-21 SOCKET CONTACT (10 REQ'D)
1015908-41 OUTER MALE BODY (10 REQ'D)
1015908-51 HYRING (10 REQ'D)

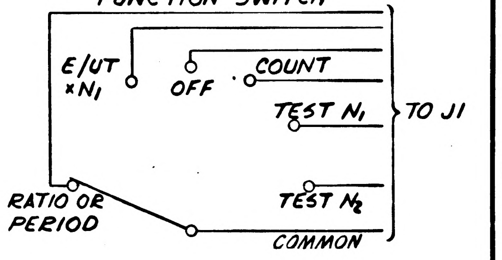
PIN NO.	SIGNAL
A	A INPUT
B	B INPUT
C	C INPUT
D	D INPUT
E	-15V LOW
F	N_1 OUTPUT
G	N_2 OUTPUT
H	SIGNAL LOW
J	
K	

AUXILIARY DECKS SHALL BE ON THE "INPUT SELECTOR" AND "FUNCTION" SWITCHES OUTPUT LINES SHALL BE BROUGHT OUT FROM EACH DECK TO J1 AS SHOWN. THE SWITCH CONTACTS SHALL BE CAPABLE OF SWITCHING 28 VDC AT 0.5 AMPS.

SELECTOR SWITCH



FUNCTION SWITCH



8▷ ALLOW 1/2 INCH CLEARANCE BEHIND EACH HOLE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Apr 63

Ⓗ **REPLACED WITH CHANGE BY REV J**

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Ramda 24 JAN 63
APPROVAL W. J. Hanson 25 JAN 63
APPROVAL A.F. Kodel 25 JAN 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

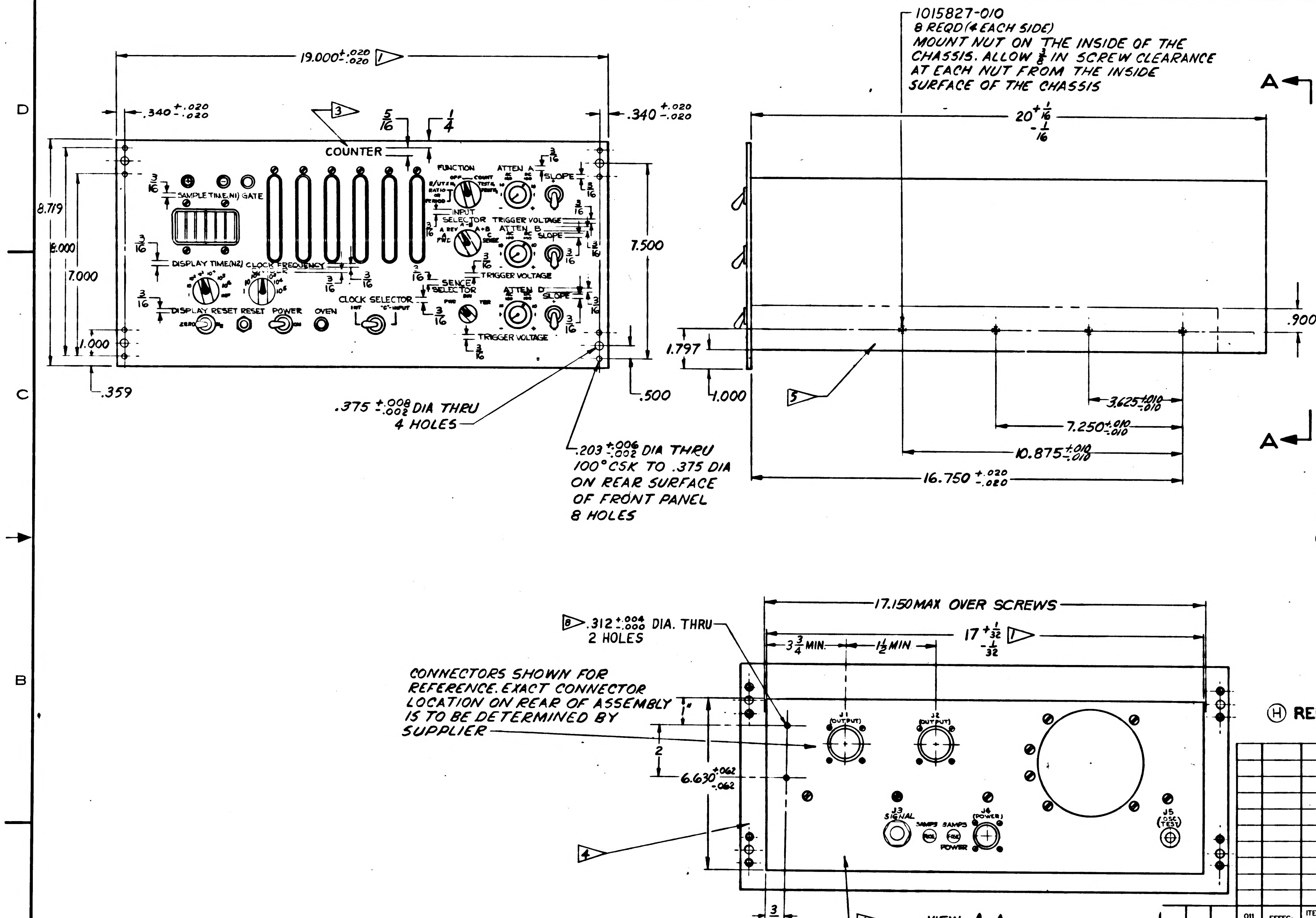
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO. SIZE D 1900032
SCALE — SHEET 4 OF 4

H | 1900032 (printed mirrored)

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
REVISIONS					
C		REVISED & REDRAWN		25 JAN 63	
D		REVISED	DO 51352	4 MAR 63	RWN / WD
D_1		CHANGE IN ACCORDANCE WITH MXC-186088		2-MAY-63	J.B.
D_2		CHANGE IN ACCORDANCE WITH MXC-186592		22 MAY-63	M.G. / P.F.
E		CHANGE IN ACCORDANCE WITH MXC- 187697		2 JUL 63	JLC / LARS
F		CHANGE IN ACCORDANCE WITH MXC-188649		5 AUG 63	JLC
G		CHANGE IN ACCORDANCE WITH MXC 189485	TDRR 03230	5 SEP 63	JGL
			"	19 SEP 63	WR
H		**REPLACED WITH CHANGE BY REV. J** **PER MXC** 19:663 **REVISED PER TDR** C8096		15 NOV 63	J.J.



19.000 +.020 -.020 ①
.340 +.020 -.020
.340 +.020 -.020
③
5/16
1/4
COUNTER
SAMPLE TIME (N1) GATE
DISPLAY TIME (N2) CLOCK FREQUENCY DIVIDER
DISPLAY RESET RESET POWER OVEN
CLOCK SELECTOR
INT "C"-INPUT
FUNCTION
INPUT SELECTOR
TRIGGER VOLTAGE
ATTEN A
SLOPE
ATTEN B
SENCE SELECTOR
ATTEN D
3/16
8.719
8.000
7.000
1.000
.359
7.500
.500
1.797
1.000
.375 +.008 -.002 DIA THRU 4 HOLES
.203 +.006 -.002 DIA THRU 100° CSK TO .375 DIA ON REAR SURFACE OF FRONT PANEL 8 HOLES
1015827-010
8 REQD (4 EACH SIDE)
MOUNT NUT ON THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS
20 +1/16 -1/16
.900 +.020 -.020
⑤
3.625 +.010 -.010
7.250 +.010 -.010
10.875 +.010 -.010
16.750 +.020 -.020
A
A
17.150 MAX OVER SCREWS
⑧ .312 +.004 -.000 DIA. THRU 2 HOLES
3 3/4 MIN.
1 1/2 MIN
17 +1/32 -1/32 ①
CONNECTORS SHOWN FOR REFERENCE. EXACT CONNECTOR LOCATION ON REAR OF ASSEMBLY IS TO BE DETERMINED BY SUPPLIER
1"
2
6.630 +.062 -.062
④
J1 (OUTPUT)
J2 (OUTPUT)
J3 SIGNAL
3AMPS 3AMPS
FUSE FUSE
POWER
J4 (POWER)
J5 (OSC TEST)
3/4
⑥
VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0098 DATE 24 Sep. 63

H	H	H	H
G	G	E	G
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

Ⓗ **REPLACED WITH CHANGE BY REV J**

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
						TO BE ASSIGNED	EPUT METER (MODEL NO. 3750/6)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS +1/64 -1/64
DECIMALS +.005 -.005
ANGLES +2° -2°
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

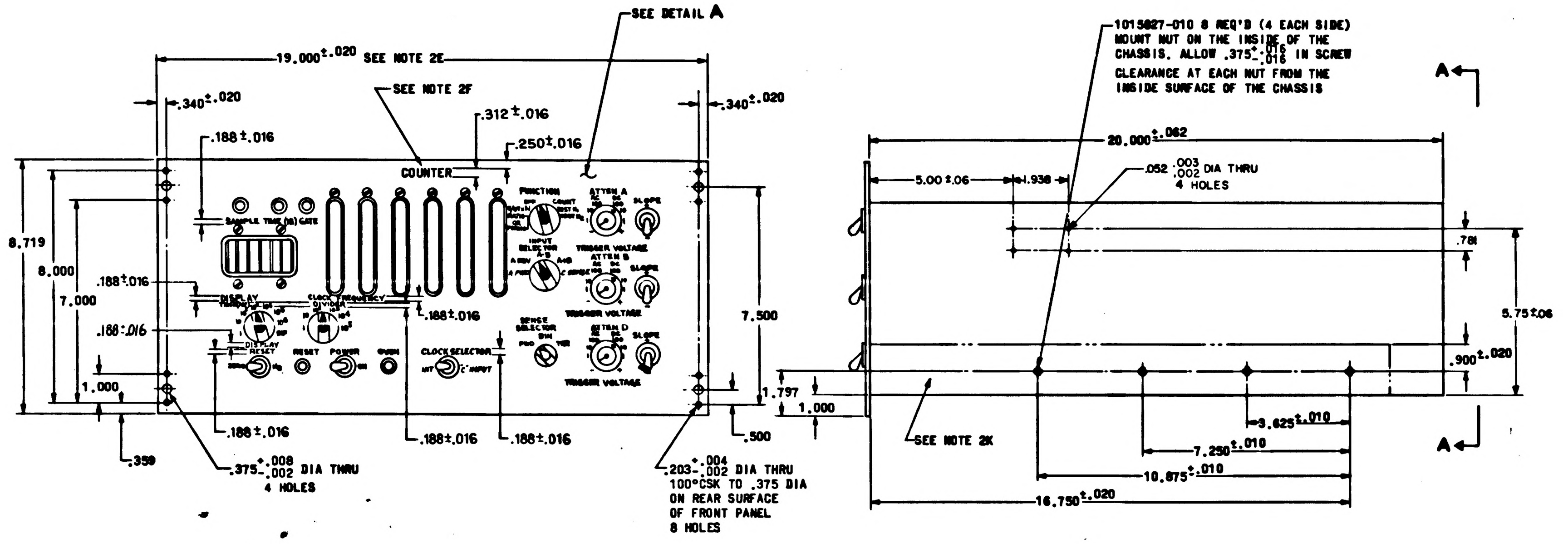
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Rennels 24 JAN 63
APPROVAL W. Hunger 25 JAN 63
APPROVAL A. Riedel 25 JAN 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

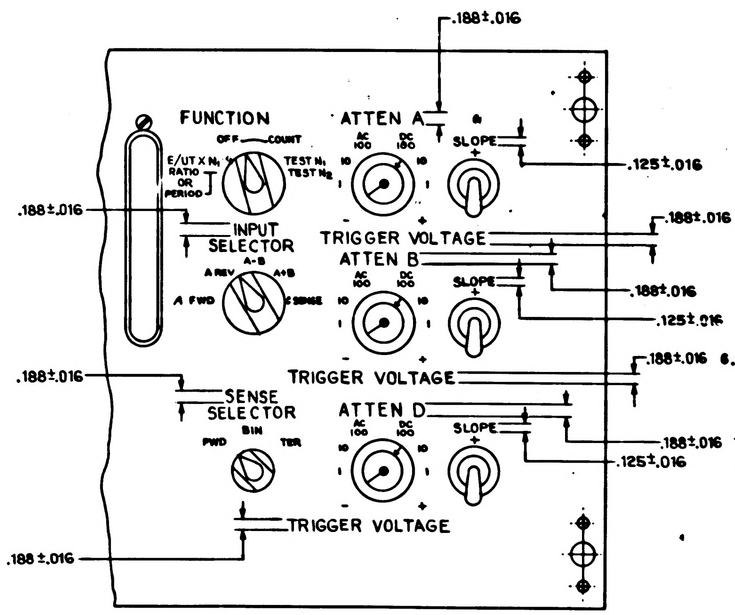
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

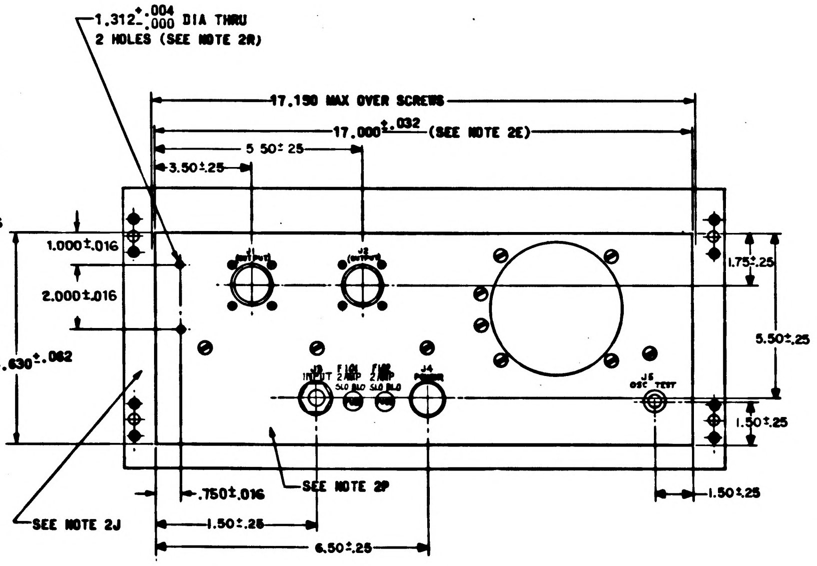
CODE IDENT NO.
SIZE D
1900032
SCALE —
SHEET 1 OF 4

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
J		REPLACES REV.H WITH CHANGE PER MXC 9 663 REVISED PER TDR ... 08096		5 NOV 63	
K		CHANGE IN ACCORDANCE WITH MXC 9 975 TDRR 01096		5-5-64	DRO WR
L		CHANGE IN ACCORDANCE WITH CM-193208. REVISED PER TDRR 02097		13 JAN 64 5-5-64	DRO WR


SEE DETAIL A
19.000±.020 SEE NOTE 2E
SEE NOTE 2F
.340±.020
.340±.020
.312±.016
.250±.016
.188±.016
COUNTER
SAMPLE TIME (M) GATE
FUNCTION
ATTEN A
SLOPE
INPUT SELECTOR A-B
TRIGGER VOLTAGE
ATTEN B
SENSE SELECTOR
ATTEN D
DISPLAY
CLOCK FREQUENCY DIVIDER
DISPLAY RESET
RESET
POWER
CLOCK SELECTOR
8.719
8.000
7.000
1.000
.188±.016
.188±.016
.359
.375 +.008 -.002 DIA THRU 4 HOLES
.188±.016
.188±.016
.188±.016
.203 +.004 -.002 DIA THRU 100°CSK TO .375 DIA ON REAR SURFACE OF FRONT PANEL 8 HOLES
7.500
.500
1.797
1.000
1015827-010 8 REQ'D (4 EACH SIDE) MOUNT NUT ON THE INSIDE OF THE CHASSIS. ALLOW .375 +.016 -.016 IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS
20.000±.062
5.00±.06
1.938
.052 +.003 -.002 DIA THRU 4 HOLES
.781
5.75±.06
.900±.020
SEE NOTE 2K
3.625±.010
7.250±.010
10.875±.010
16.750±.020
A
A


.188±.016
FUNCTION
OFF
COUNT
E/UT X N1
RATIO OR PERIOD
TEST N1
TEST N2
ATTEN A
AC 100
DC 100
SLOPE
.125±.016
INPUT SELECTOR
A-B
A REV
A+B
A FWD
C SENSE
TRIGGER VOLTAGE
ATTEN B
.188±.016
.188±.016
.125±.016
.188±.016
.188±.016
SENSE SELECTOR
BIN
FWD
TSR
TRIGGER VOLTAGE
ATTEN D
.188±.016
.125±.016
TRIGGER VOLTAGE
.188±.016

DETAIL A


1.312 +.004 -.000 DIA THRU 2 HOLES (SEE NOTE 2R)
17.150 MAX OVER SCREWS
17.000±.032 (SEE NOTE 2E)
5.50±.25
3.50±.25
1.000±.016
2.000±.016
6.630±.062
J1 (OUTPUT)
J2 (OUTPUT)
J3 INPUT
F101 2 AMP SLO BLO
F102 2 AMP SLO BLO
J4 POWER
J5 OSC TEST
1.75±.25
5.50±.25
1.50±.25
.750±.016
SEE NOTE 2P
SEE NOTE 2J
1.50±.25
6.50±.25
1.50±.25

VIEW - A - A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00411 DATE 26 Apr 63

L	L
K	J
J	J
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓙ REPLACES REV H WITH CHANGE.

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						To BE ASSIGNED	EPUT METER (MODEL NO. 3350/6
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011	1900041	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ −	+.005	+2°
− −	−.005	−2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. REMDE 24 JAN 63
APPROVAL M.G. HAUSER 25 JAN 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.
SIZE E
1900032
SCALE NONE
SHEET 1 OF 2

1900032 L

REQUIREMENTS:

1. ELECTRICAL SPECIFICATIONS:
   - A. "INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:
     - (1) "A FWD": INPUT (2 MC MAX) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.
     - (2) "A REV": "A" INPUT (100 KC MAX) IS COUPLED TO THE "FUNCTION" SWITCH. COUNTING IS FORWARD ONLY BUT THE "-" POLARITY LAMP IS LIT.
     - (3) "A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 50µS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.
     - (4) "A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 20µS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.
     - (5) "C-SENSE": THE INTERNAL (100 KC) CLOCK IS FED THRU THE "CLOCK FREQUENCY DIVIDER" TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.
   - B. "FUNCTION", ROTARY SWITCH WITH THE FOLLOWING POSITIONS:
     - (1) "RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 µS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES THE INTERNAL (100 KC) CLOCK AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C - SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION. IN THE "PERIOD" FUNCTION THE COUNT GATE REMAINS OPEN FOR A LENGTH OF TIME DETERMINED BY "N" "D" PULSES, AND DURING THE GATE OPEN TIME THE CLOCK PULSES FROM THE "CLOCK FREQUENCY DIVIDER", VIA "C - SENSE" POSITION OF THE "INPUT SELECTOR", ARE COUNTED.
     - (2) "EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT - GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT - ACCUMULATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE INTERNAL (100 KC) CLOCK AFTER WHICH THE INSTRUMENT AUTOMATICALLT RESETS AND RECYCLES.
     - (3) "TEST N_1": THE INTERNAL (100 KC) CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.
     - (4) OFF: SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE WHICH IS HELD PERMANENTLY CLOSED AND NO COUNTS ARE ACCUMULATED.
     - (5) "TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 PULSES FROM THE "CLOCK FREQUENCY DIVIDER".
     - (6) "COUNT": SIGNALS FROM THE INPUT SELECTOR ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED COUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET BUTTON ONLY.
   - C. "SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999".
   - D. "DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS:- "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" AND "INF". (INFINITE DISPLAY TIME WITH MANUAL RESET).
   - E. "DISPLAY RESET": EXCEPT IN THE "TEST", "OFF", AND "COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE INTERNAL CLOCK (100KC). AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS (EXCEPT IN THE "INF" POSITION) AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT PANEL ROTARY SWITCH.
     - (1) "ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.
     - (2) "N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.
     - (3) * ON 10^6 POSITION COUNTER RESETS TO ZERO.
   - F. "SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.
     - (1) "FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" AND "B" INPUT CONDITIONS.
     - (2) "BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12V).
     - (3) "TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" AND "B" INPUT CHANNELS, AS FOLLOWS:
       - a. IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.
       - b. WHEN "A" CHANNEL OUTPUT IS "1" AND "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.
       - c. WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE IN REVERSE.
     - (4) "CLOCK FREQUENCY DIVIDER": A 6-POSITION ROTARY SWITCH WHICH DIVIDES THE INTERNAL (100 KC) CLOCK AND THE "C" INPUT BY ONE OF FOLLOWING FACTORS "1", "10", "10^2", "10^3", "10^4", "10^5".
     - (5) INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.
       - a. "ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).
       - b. "TRIGGER-VOLTAGE" "+" "-": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.
       - c. "SLOPE" CONTROL "+" AND "-": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.
     - (6) "RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.
     - (7) "POWER-ON": TOGGLE SWITCH.
     - (8) "CLOCK SELECTOR": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.
     - (9) "A" INPUT:
       - a. COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.
       - b. SENSITIVITY: 100 MV RMS.
       - c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.
     - (10) "B" INPUT:
       - a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.
       - b. SENSITIVITY: 100 MV RMS.
       - c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.
     - (11) "C" INPUT:
       - a. INPUT RATE: 10 CPS TO 100 KC.
       - b. INPUT RANGE: 1 VOLT TO 28 VOLTS RMS
       - c. SENSITIVITY: 1 VOLT RMS.
       - d. IMPEDANCE: 1.00 KΩ MIN.
     - (12) "D" INPUT:
       - a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED TO 10 CPS TO 100 KC.
       - b. SENSITIVITY: 100 MV RMS
       - c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.
     - (13) CONNECTOR OUTPUTS:
       - a. DIGITS: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION $-.2^{+.3}_{-.1}$ VOLTS FOR BINARY "1" AND -12.5 ± 1 VOLT FOR BINARY "0" OUTPUT IMPEDANCE 100 KΩ ± 10 %. OUTPUT CURRENT 50 MICRO AMPS MAX.
       - b. PRINT COMMAND: A DC CHANGE FROM BINARY "1" TO BINARY "0" SHALL BE AVAILABLE WHEN THE COUNT GATE CLOSES .35 KΩ OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA.
       - c. POLARITY COMMAND: A BINARY "0" SHALL REPRESENT A "+" POLARITY AND A BINARY "1" SHALL REPRESENT A "-" POLARITY. -12.5 ± 1 VOLT FOR BINARY "0". $-.2^{+.3}_{-.1}$ VOLT FOR BINARY "1". OUTPUT IMPEDANCE 1 KΩ ± 5% OUTPUT CURRENT 1 MA MAX.
       - d. COLOR COMMAND: A BINARY "0" SHALL BE AVAILABLE TO PRODUCE A BLACK PRINT-OUT ON THE PRINTER.
       - e. IN "RATIO OR PERIOD", "E/UT X N_1" "TEST N_1" AND "TEST N_2" THE COUNTER SHALL BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2 MA MAX.
       - f. REMOTE RESET: A REMOTE RESET SHALL BE BROUGHT OUT IN PARALLEL WITH THE FRONT PANEL RESET.
     - (14) "N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5(±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.
     - (15) "N_2" TIME BASE OUTPUT": BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.
     - (16) INDICATORS:
       - a. 6 DIGITS COLUMNAR. DISPLAY INDICATES ACCUMULATED COUNT.
       - b. "+" AND "-" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.
       - c. "GATE": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.
     - (17) POWER REQUIREMENTS: 115 AC LINE ± 10% 60 ± 5 CPS APPROXIMATELY 100 WATTS.
     - (18) CLOCK STABILITY: THE INTERNAL CLOCK (100 KC ± 1 CPS) SHALL HAVE A STABILITY OF 2 PARTS IN 10^7 PER DAY AND 5 PARTS IN 10^7 PER WEEK.
     - (19) OSC TEST: THE INTERNAL CLOCK (100 KC) SHALL BE BROUGHT OUT TO J5 OSC TEST JACK.

2. MECHANICAL SPECIFICATIONS:
   - A. TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP-1900032.
   - B. ALL KNOBS SHALL BE PER MS 91528 TYPE F AND K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.
   - C. THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND 1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.
   - D. FRONT PANEL MATERIAL: QQ-A-318, TEMPER H 32, TYPE 5052 ALUMINUM .203/.172 THICK
   - E. 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. SIDES OF CHASSIS LOCATED BY 17 INCH DIM. SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.
   - F. CHARACTERS PER ND 1002122. CHARACTER HEIGHT .141/.109 EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.
   - G. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - H. WEIGHT: NOT TO EXCEED 50 LBS.
   - J. BORDER AREA, WITHIN .578/.547 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.
   - K. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.
   - L. SIGNAL INPUTS, CHASSIS AND POWER SOURCE SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.
   - M. DATA SOURCE:
     BECKMAN INSTRUMENTS INC., BERKELEY DIV.
     RICHMOND, CALIFORNIA
     REVERSING EPUT METER MODEL 3350/6-6.
   - N. THE COUNTER SHALL BE ELECTRICALLY COMPATIBLE FOR SIMULTANEOUS USE WITH THE "INDICATOR, COUNTER, REMOTE" PART NUMBER 1900020 AND PRINTER PART NUMBER 1900063.
   - P. CONNECTOR INFORMATION

J5
OSC TEST
BNC UG-1094/U

J3 SIGNAL INPUT
1015906-100 CONNECTOR (1 REQ'D)
1015908-21 SOCKET CONTACT (10 REQ'D)
1015908-41 OUTER MALE BODY (10 REQ'D)
1015908-51 HYRING (10 REQ'D)

PIN NO.	SIGNAL
A	A INPUT
B	B INPUT
C	C INPUT
D	D INPUT
E	-15V LOW
F	N_1 OUTPUT
G	N_2 OUTPUT
H	SIGNAL LOW
J	
K	

J4 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL CHASSIS
A	
B	
C	
D	INPUT POWER HI
E	INPUT POWER LO
F	
G	
H	

J1 SIGNAL OUTPUT
MS3112E22-55S

PIN NO.	SIGNAL	
B	1	DIGIT 1 OR LSD
C	2	
D	4	
E	8	
A		
F		
G		
H	1	DIGIT 2
J	2	
K	4	
L	8	
M		
N		
P	1	DIGIT 3
R	2	
S	4	
T	8	
U		
V		
W	1	DIGIT 4
X	2	
Y	4	
Z	8	
a		
b	1	DIGIT 5
$\overline{c}$	2	
d	4	
e	8	
f		
g	1	DIGIT 6 MSD
h	2	
i	4	
j	8	

PIN NO.	SIGNAL	
$\overline{K}$	REMOTE RESET	
m	PRINT-OUT COLOR CONTROL	
n		
P	SIGN INDICATOR "0"=(+) "1"=(-)	
r	PRINT COMMAND, OR READOUT CONTROL	
$\overline{S}$	INHIBIT RESET (AN INPUT SIGNAL)	
t	SIGNAL GROUND	
u	DISPLAY OVER RIDE	
v	COMMON, SELECTOR SWITCH	
w	A FWD	SIGNALS FROM THE SELECTOR SWITCH
x	A REV	
y	A - B	
z	A + B	
AA	C SENSE	
BB	COMMON, FUNCTION SWITCH	
EE	OFF	SIGNALS FROM THE FUNCTION SWITCH
FF	COUNT	
CC	RATIO OR PERIOD	
DD	EPUT X N_1	
GG	TEST N_1	
HH	TEST N_2	

J2 SIGNAL OUTPUT
MS 3112E-22-55 SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS $\overline{k}$, m, n, $\overline{S}$, u, v, w, $\overline{X}$, y, z, AA, BB, CC, DD, EE, FF, GG, ANL, HH, ARE SPARES.

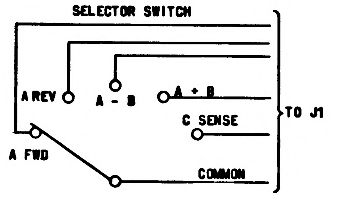
R. ALLOW .500 ±.016 CLEARANCE BEHIND EACH HOLE.

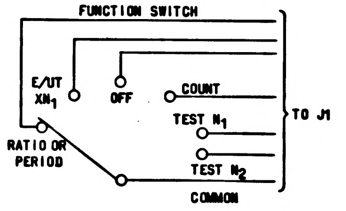
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
J		REPLACES REV. H WITH CHANGE PER MXC 9-663 REVISED PER TDR 39096		15 NOV 63 5-5-64	
L		CHANGE IN ACCORDANCE WITH CM-193208 REVISED PER TDRR 28097		13 JAN 64 5-5-64	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00996 DATE 24 apr 63

AUXILIARY DECKS SHALL BE ON THE "INPUT SELECTOR" AND "FUNCTION" SWITCHES OUTPUT LINES SHALL BE BROUGHT OUT FROM EACH DECK TO J1 AS SHOWN. THE SWITCH CONTACTS SHALL BE CAPABLE OF SWITCHING 28 VDC AT 0.5 AMPS.





Ⓙ REPLACES REVH WITH CHANGE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES + — + — + — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN SK 44258	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	DRAWN W. MUNSON DATE 17 JAN 63 CHECKED P. REMDE 24 JAN 63 APPROVAL M.G. HAUSER 25 JAN 63 APPROVAL	COUNTER
MATERIAL	NASA APPROVAL	CODE IDENT NO. · SIZE E · 1900032
CONTRACT NAS 9-497	MIT APPROVAL	SCALE NONE · SHEET 2 OF 2

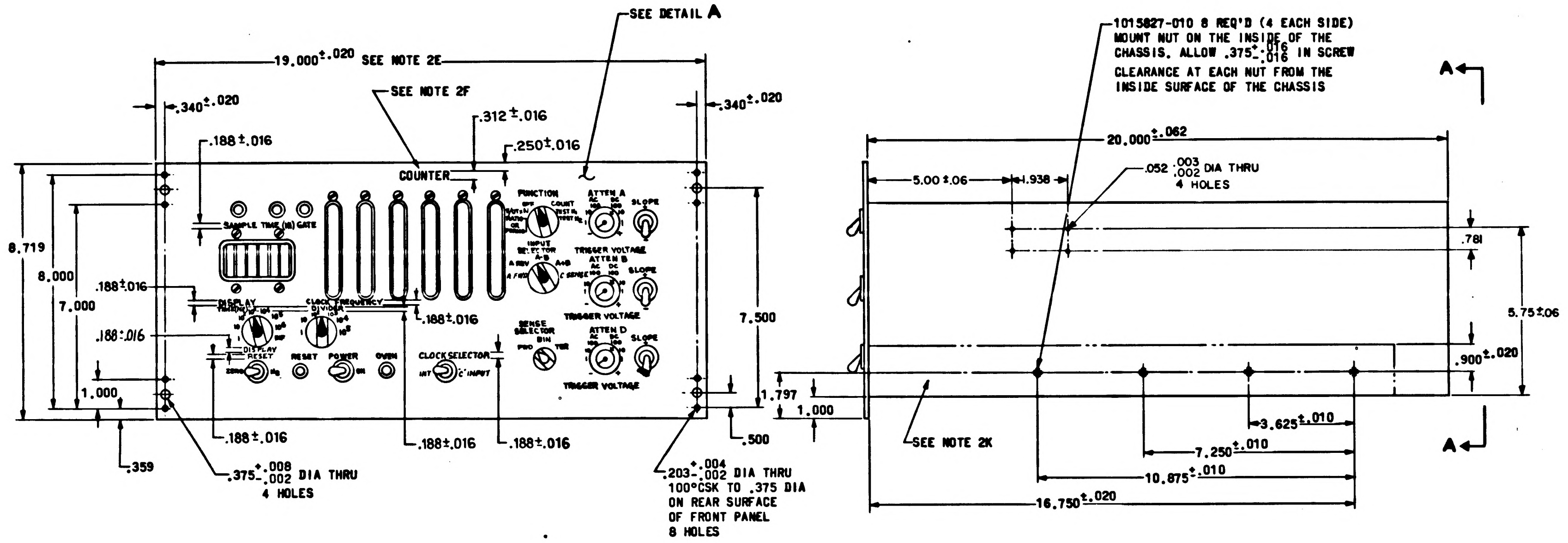
L 1900032

MIL 1077E P

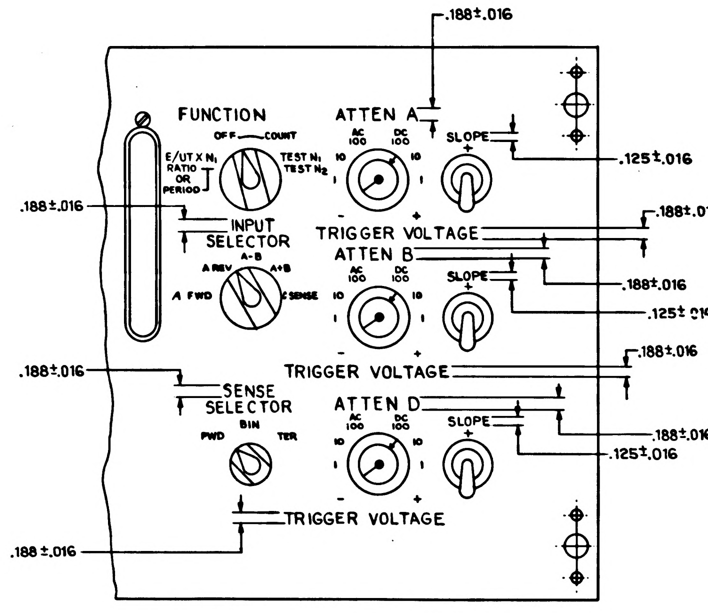
REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
J		REPLACES REV. H WITH CHANGE PER MXC 9 663 REVISED PER TDR TDRR 06096		5 NOV 63	
K		CHANGE IN ACCORDANCE WITH MXC 19,975 TDRR 01096		5-5-64	DKD
L		CHANGE IN ACCORDANCE WITH CM-193208. REVISED PER TDRR 07-97		13 JAN 64 5-5-64	DKD
M		REPLACED WITH CHANGE BY REV. N PER TDRR 20387		JUL 65	RLP

Ⓜ

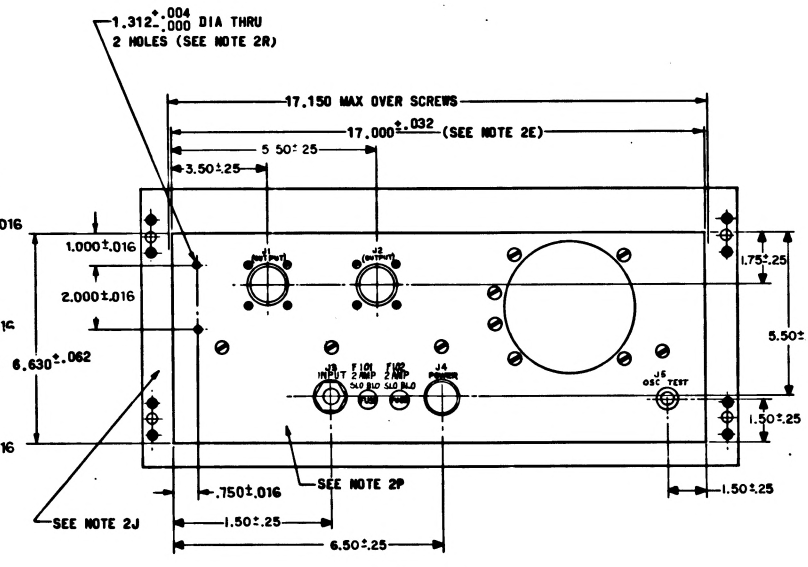


SEE DETAIL A
19.000±.020 SEE NOTE 2E
SEE NOTE 2F
.340±.020
.340±.020
.312±.016
.250±.016
.188±.016
COUNTER
SAMPLE TIME (M) GATE
FUNCTION
ATTEN A
SLOPE
TRIGGER VOLTAGE
ATTEN B
ATTEN D
INPUT SELECTOR
SENSE SELECTOR
DISPLAY
CLOCK FREQUENCY DIVIDER
DISPLAY RESET
RESET
POWER
OVEN
CLOCK SELECTOR
8.719
8.000
7.000
.188±.016
.188±.016
1.000
.359
.188±.016
.188±.016
.188±.016
.188±.016
.375+.008/-.002 DIA THRU
4 HOLES
7.500
1.797
1.000
.500
.203+.004/-.002 DIA THRU
100°CSK TO .375 DIA
ON REAR SURFACE
OF FRONT PANEL
8 HOLES
1015827-010 8 REQ'D (4 EACH SIDE)
MOUNT NUT ON THE INSIDE OF THE
CHASSIS. ALLOW .375+.016/-.016 IN SCREW
CLEARANCE AT EACH NUT FROM THE
INSIDE SURFACE OF THE CHASSIS
A
A
20.000±.062
5.00±.06
1.938
.052 .003/.002 DIA THRU
4 HOLES
.781
5.75±.06
.900±.020
SEE NOTE 2K
3.625±.010
7.250±.010
10.875±.010
16.750±.020



.188±.016
FUNCTION
OFF
COUNT
E/UT X N1
RATIO
OR
PERIOD
TEST N1
TEST N2
ATTEN A
AC 100
DC 100
SLOPE
.125±.016
.188±.016
INPUT SELECTOR
A-B
A REV
A+B
A FWD
C SENSE
TRIGGER VOLTAGE
.188±.016
ATTEN B
.188±.016
.125±.016
.188±.016
TRIGGER VOLTAGE
.188±.016
SENSE SELECTOR
BIN
FWD
TER
ATTEN D
.188±.016
.125±.016
TRIGGER VOLTAGE
.188±.016

DETAIL A



1.312+.004/-.000 DIA THRU
2 HOLES (SEE NOTE 2R)
17.150 MAX OVER SCREWS
17.000±.032 (SEE NOTE 2E)
5.50±.25
3.50±.25
1.000±.016
2.000±.016
6.630±.062
J1 (OUTPUT)
J2 (OUTPUT)
J3 INPUT
F101 2 AMP SLO BLO
F102 2 AMP SLO BLO
J4 POWER
J5 OSC TEST
1.75±.25
5.50±.25
1.50±.25
.750±.016
SEE NOTE 2P
1.50±.25
1.50±.25
6.50±.25
SEE NOTE 2J

VIEW - A - A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00448 DATE 24 Apr 63

Ⓜ REPLACED WITH CHANGE BY REV Ⓝ

Ⓙ REPLACES REV H WITH CHANGE

M	M
L	L
J	J
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

			011	EFFEC-TIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						To BE ASSIGNED	EPUT METER (MODEL NO. 3350/6

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011	300004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ .005	+ 2°
— —	— .005	— 2°

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK 44258

DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. REMDE 24 JAN 63
APPROVAL M.G. HAUSER 25 JAN 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO. 99974
SIZE E
1900032
SCALE NONE
SHEET 1 OF 2

1900032 M

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
J		REPLACES REV. H WITH CHANGE PER MXC 9-663 REVISED PER TDR 03096		5 NOV 63 5-5-64	
L		CHANGE IN ACCORDANCE WITH CV-193208 REVISED PER TDRR 08097		13 JAN 64 5-5-64	
M		REPLACED WITH CHANGE BY REV. N PER TDRR 20387		65	

REQUIREMENTS:

1. ELECTRICAL SPECIFICATIONS:

A. "INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:

(1) "A FWD": INPUT (2 MC MAX) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.

(2) "A REV": "A" INPUT (100 KC MAX) IS COUPLED TO THE "FUNCTION" SWITCH. COUNTING IS FORWARD ONLY BUT THE "-" POLARITY LAMP IS LIT.

(3) "A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 50µS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.

(4) "A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 20µS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.

(5) "C-SENSE": THE INTERNAL (100 KC) CLOCK IS FED THRU THE "CLOCK FREQUENCY DIVIDER" TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.

B. "FUNCTION", ROTARY SWITCH WITH THE FOLLOWING POSITIONS:

(1) "RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 µS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES THE INTERNAL (100 KC) CLOCK AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C - SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION. IN THE "PERIOD" FUNCTION THE COUNT GATE REMAINS OPEN FOR A LENGTH OF TIME DETERMINED BY "N" "D" PULSES, AND DURING THE GATE OPEN TIME THE CLOCK PULSES FROM THE "CLOCK FREQUENCY DIVIDER", VIA "C - SENSE" POSITION OF THE "INPUT SELECTOR", ARE COUNTED.

(2) "EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT - GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT - ACCUMULATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE INTERNAL (100 KC) CLOCK AFTER WHICH THE INSTRUMENT AUTOMATICALLT RESETS AND RECYCLES.

(3) "TEST N_1": THE INTERNAL (100 KC) CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE CLOCK FREQUENCY DIVIDER. THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.

(4) OFF: SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE WHICH IS HELD PERMANENTLY CLOSED AND NO COUNTS ARE ACCUMULATED.

(5) "TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 PULSES FROM THE "CLOCK FREQUENCY DIVIDER".

(6) "COUNT": SIGNALS FROM THE INPUT SELECTOR ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED COUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET BUTTON ONLY.

C. "SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999".

D. "DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS:- "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" AND "INF". (INFINITE DISPLAY TIME WITH MANUAL RESET).

E. "DISPLAY RESET": EXCEPT IN THE "TEST", "OFF", AND "COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE INTERNAL CLOCK (100KC). AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS (EXCEPT IN THE "INF" POSITION) AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT PANEL ROTARY SWITCH.

(1) "ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.

(2) "N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.

(3) * ON 10^6 POSITION COUNTER RESETS TO ZERO.

F. "SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.

(1) "FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" AND "B" INPUT CONDITIONS.

(2) "BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12V).

(3) "TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" AND "B" INPUT CHANNELS, AS FOLLOWS:

a. IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.

b. WHEN "A" CHANNEL OUTPUT IS "1" AND "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.

c. WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE IN REVERSE.

(4) "CLOCK FREQUENCY DIVIDER": A 6-POSITION ROTARY SWITCH WHICH DIVIDES THE INTERNAL (100 KC) CLOCK AND THE "C" INPUT BY ONE OF FOLLOWING FACTORS "1", "10", "10^2", "10^3", "10^4", "10^5".

(5) INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.

a. "ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).

b. "TRIGGER-VOLTAGE" "+" "-": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.

c. "SLOPE" CONTROL "+" AND "-": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.

(6) "RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.

(7) "POWER-ON": TOGGLE SWITCH.

(8) "CLOCK SELECTOR": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.

(9) "A" INPUT:

a. COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.

b. SENSITIVITY: 100 MV RMS.

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(10) "B" INPUT:

a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.

b. SENSITIVITY: 100 MV RMS.

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(11) "C" INPUT:

a. INPUT RATE: 10 CPS TO 100 KC.

b. INPUT RANGE: 1 VOLT TO 28 VOLTS RMS

c. SENSITIVITY: 1 VOLT RMS.

d. IMPEDANCE: 1.00 KΩ MIN.

(12) "D" INPUT:

a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED TO 10 CPS TO 100 KC.

b. SENSITIVITY: 100 MV RMS

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(13) CONNECTOR OUTPUTS:

a. DIGITS: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION $-.2^{+.3}_{-.1}$ VOLTS FOR BINARY "1" AND -12.5 ± 1 VOLT FOR BINARY "0" OUTPUT IMPEDANCE 100 KΩ ± 10 %. OUTPUT CURRENT 50 MICRO AMPS MAX.

b. PRINT COMMAND: A DC CHANGE FROM BINARY "1" TO BINARY "0" SHALL BE AVAILABLE WHEN THE COUNT GATE CLOSES .35 KΩ OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA.

c. POLARITY COMMAND: A BINARY "0" SHALL REPRESENT A "+" POLARITY AND A BINARY "1" SHALL REPRESENT A "-" POLARITY. -12.5 ± 1 VOLT FOR BINARY "0". $-.2^{+.3}_{-.1}$ VOLT FOR BINARY "1". OUTPUT IMPEDANCE 1 KΩ ± 5% OUTPUT CURRENT 1 MA MAX.

d. COLOR COMMAND: A BINARY "0" SHALL BE AVAILABLE TO PRODUCE A BLACK PRINT-OUT ON THE PRINTER.

e. IN "RATIO OR PERIOD", "E/UT X N_1" "TEST N_1" AND "TEST N_2" THE COUNTER SHALL BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2 MA MAX.

f. REMOTE RESET: A REMOTE RESET SHALL BE BROUGHT OUT IN PARALLEL WITH THE FRONT PANEL RESET.

(14) "N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5(±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.

(15) "N_2" TIME BASE OUTPUT": BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.

(16) INDICATORS:

a. 6 DIGITS COLUMNAR. DISPLAY INDICATES ACCUMULATED COUNT.

b. "+" AND "-" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.

c. "GATE": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.

(17) POWER REQUIREMENTS: 115 AC LINE ± 10% 60 ± 5 CPS APPROXIMATELY 100 WATTS.

(18) CLOCK STABILITY: THE INTERNAL CLOCK (100 KC ± 1 CPS) SHALL HAVE A STABILITY OF 2 PARTS IN 10^7 PER DAY AND 5 PARTS IN 10^7 PER WEEK.

(19) OSC TEST: THE INTERNAL CLOCK (100 KC) SHALL BE BROUGHT OUT TO J5 OSC TEST JACK.

2. MECHANICAL SPECIFICATIONS:

A. TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP-1900032.

B. ALL KNOBS SHALL BE PER MS 91528 TYPE F AND K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

C. THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND 1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

D. FRONT PANEL MATERIAL: QQ-A-318, TEMPER H 32, TYPE 5052 ALUMINUM .203/.172 THICK

E. 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY. SIDES OF CHASSIS LOCATED BY 17 INCH DIM. SHALL BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD. 595.

F. CHARACTERS PER ND 1002122. CHARACTER HEIGHT .141/.109 EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN.

G. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

H. WEIGHT: NOT TO EXCEED 50 LBS.

J. BORDER AREA, WITHIN .578/.547 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

K. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.

L. SIGNAL INPUTS, CHASSIS AND POWER SOURCE SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

M. DATA SOURCE:

BECKMAN INSTRUMENTS INC., BERKELEY DIV.
RICHMOND, CALIFORNIA
REVERSING EPUT METER MODEL 3350/6-6.

N. THE COUNTER SHALL BE ELECTRICALLY COMPATIBLE FOR SIMULTANEOUS USE WITH THE "INDICATOR, COUNTER, REMOTE" PART NUMBER 1900020 AND PRINTER PART NUMBER 1900063.

P. CONNECTOR INFORMATION

J5
OSC TEST
BNC UG-1094/U

J3 SIGNAL INPUT
1015906-100 CONNECTOR (1 REQ'D)
1015908-21 SOCKET CONTACT (10 REQ'D)
1015908-41 OUTER MALE BODY (10 REQ'D)
1015908-51 HYRING (10 REQ'D)

PIN NO.	SIGNAL
A	A INPUT
B	B INPUT
C	C INPUT
D	D INPUT
E	-15V LOW
F	N_1 OUTPUT
G	N_2 OUTPUT
H	SIGNAL LOW
J	
K	

J4 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL CHASSIS
A	
B	
C	
D	INPUT POWER HI
E	INPUT POWER LO
F	
G	
H	

J1 SIGNAL OUTPUT
MS3112E22-55S

PIN NO.	SIGNAL	
B	1	DIGIT 1 OR LSD
C	2	
D	4	
E	8	
A		
F		
G		
H	1	DIGIT 2
J	2	
K	4	
L	8	
M		
N		
P	1	DIGIT 3
R	2	
S	4	
T	8	
U		
V		
W	1	DIGIT 4
X	2	
Y	4	
Z	8	
a		
b	1	DIGIT 5
$\bar{c}$	2	
d	4	
e	8	
f		
g	1	DIGIT 6 MSD
h	2	
i	4	
j	8	

PIN NO.	SIGNAL	
$\bar{K}$	REMOTE RESET	
m	PRINT-OUT COLOR CONTROL	
n		
P	SIGN INDICATOR "0"=(+) "1"=(-)	
r	PRINT COMMAND, OR READOUT CONTROL	
$\bar{S}$	INHIBIT RESET (AN INPUT SIGNAL)	
t	SIGNAL GROUND	
u	DISPLAY OVER RIDE	
$\bar{v}$	COMMON, SELECTOR SWITCH	
$\bar{w}$	A FWD	SIGNALS FROM THE SELECTOR SWITCH
X	A REV	
y	A - B	
$\bar{z}$	A + B	
AA	C SENSE	
BB	COMMON, FUNCTION SWITCH	
EE	OFF	SIGNALS FROM THE FUNCTION SWITCH
FF	COUNT	
CC	RATIO OR PERIOD	
DD	EPUT X N_1	
GG	TEST N_1	
HH	TEST N_2	

J2 SIGNAL OUTPUT
MS 3112E-22-55 SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS $\bar{k}$, m, n, $\bar{S}$, u, v, w, $\bar{X}$, y, z, AA, BB, CC, DD, EE, FF, GG, ANL, HH, ARE SPARES.

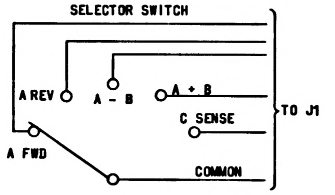
R. ALLOW .500 ±.016 CLEARANCE BEHIND EACH HOLE.

FOR INFORMATION ONLY

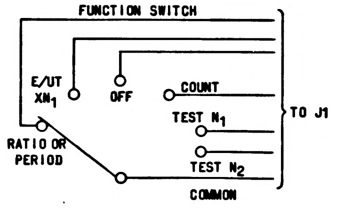
CLASS B RELEASE TDR No. 00998 DATE 24 apr 63

AUXILIARY DECKS SHALL BE ON THE "INPUT SELECTOR" AND "FUNCTION" SWITCHES OUTPUT LINES SHALL BE BROUGHT OUT FROM EACH DECK TO J1 AS SHOWN. THE SWITCH CONTACTS SHALL BE CAPABLE OF SWITCHING 28 VDC AT 0.5 AMPS.

SELECTOR SWITCH



FUNCTION SWITCH



Ⓜ REPLACED WITH CHANGE BY REV Ⓝ

Ⓙ REPLACES REV H WITH CHANGE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES + – + – + – – – – – – –	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN SK 44258 DRAWN W. MUNSON DATE 17 JAN 63 CHECKED P. REMDE 24 JAN 63 APPROVAL M.G. HAUSER 25 JAN 63 APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS COUNTER
DO NOT SCALE THIS DRAWING MATERIAL CONTRACT NAS 9-497	NASA APPROVAL MIT APPROVAL	CODE IDENT NO. 99974 SIZE E 1900032 SCALE NONE SHEET 2 OF 2

1900032 M

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	DKD

TDRR 00998

REQUIREMENTS:

1. ELECTRICAL SPECIFICATIONS:

A. "INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:

(1) "A FWD": INPUT (2 MC MAX) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.

(2) "A REV": "A" INPUT (100 KC MAX) IS COUPLED TO THE "FUNCTION SWITCH. COUNTING IS FORWARD ONLY BUT THE "-" POLARITY LAMP IS LIT.

(3) "A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 50µS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.

(4) "A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 20µS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.

(5) "C-SENSE": THE INTERNAL (100 KC) CLOCK IS FED THRU THE "CLOCK FREQUENCY DIVIDER" TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.

B. "FUNCTION", ROTARY SWITCH WITH THE FOLLOWING POSITIONS:

(1) "RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 µS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES OF THE INTERNAL (100 KC) CLOCK, AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C - SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION. IN THE "PERIOD" FUNCTION THE COUNT GATE REMAINS OPEN FOR A LENGTH OF TIME DETERMINED BY "N" "D" PULSES, AND DURING THE GATE OPEN TIME THE CLOCK PULSES FROM THE "CLOCK FREQUENCY DIVIDER", VIA "C - SENSE" POSITION OF THE "INPUT SELECTOR", ARE COUNTED.

(2) "EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT - GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE "CLOCK FREQUENCY DIVIDER." THE COUNT - ACCUMULATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE INTERNAL (100 KC) CLOCK AFTER WHICH THE INSTRUMENT AUTOMATICALLY RESETS AND RECYCLES.

(3) "TEST N_1": THE INTERNAL (100 KC) CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE "CLOCK FREQUENCY DIVIDER." THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.

(4) OFF: SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE WHICH IS HELD PERMANENTLY CLOSED AND NO COUNTS ARE ACCUMULATED.

(5) "TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 PULSES FROM THE "CLOCK FREQUENCY DIVIDER".

(6) "COUNT": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED CCUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET BUTTON ONLY.

C. "SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999"

D. "DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS: - "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" AND "INF". (INFINITE DISPLAY TIME WITH MANUAL RESET).

E. "DISPLAY RESET": EXCEPT IN THE "TEST", "OFF", AND "COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE INTERNAL CLOCK (100 KC). AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS (EXCEPT IN THE "INF" POSITION) AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT PANEL ROTARY SWITCH.

(1) "ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.

(2) "N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.

(3) * ON 10^6 POSITION COUNTER RESETS TO ZERO.

F. "SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.

(1) "FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" AND "B" INPUT CONDITIONS.

(2) "BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12V).

(3) "TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" AND "B" INPUT CHANNELS, AS FOLLOWS:

a. IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.

b. WHEN "A" CHANNEL OUTPUT IS "1" AND "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.

c. WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE REVERSE.

(4) "CLOCK FREQUENCY DIVIDER": A 6-POSITION ROTARY SWITCH WHICH DIVIDES THE INTERNAL (100 KC) CLOCK AND THE "C" INPUT BY ONE OF THE FOLLOWING FACTORS "1", "10", "10^2", "10^3", "10^4", "10^5".

(5) INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.

a. "ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).

b. "TRIGGER-VOLTAGE" "+" "-": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.

c. "SLOPE" CONTROL "+" AND "-": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.

(6) "RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.

(7) "POWER-ON": TOGGLE SWITCH.

(8) "CLOCK SELECTOR": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.

(9) "A" INPUT"

a. COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.

b. SENSITIVITY: 100 MV RMS.

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(10) "B" INPUT"

a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.

b. SENSITIVITY: 100 MV RMS.

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(11) "C" INPUT:

a. INPUT RATE: 10 CPS TO 100 KC.

b. INPUT RANGE: 1 VOLT TO 28 VOLTS RMS

c. SENSITIVITY: 1 VOLT RMS.

d. IMPEDANCE: 1.00 KΩ MIN.

(12) "D" INPUT:

a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED TO 10 CPS TO 100 KC.

b. SENSITIVITY: 100 MV RMS

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(13) CONNECTOR OUTPUTS:

a. DIGITS: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION $-.2^{+.3}_{-.1}$ VOLTS FOR BINARY "1" AND -12.5 ± 1 VOLT FOR BINARY "0" OUTPUT IMPEDANCE 100 KΩ ± 10%. OUTPUT CURRENT 50 MICRO AMPS MAX.

b. PRINT COMMAND: A DC CHANGE FROM BINARY "1" TO BINARY "0" SHALL BE AVAILABLE WHEN THE COUNT GATE CLOSES .35 KΩ OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA.

c. POLARITY COMMAND: A BINARY "0" SHALL REPRESENT A "+" POLARITY AND A BINARY "1" SHALL REPRESENT A "-" POLARITY. -12.5 ± 1 VOLT FOR BINARY "0". $-.2^{+.3}_{-.1}$ VOLT FOR BINARY "1". OUTPUT IMPEDANCE 1 KΩ ± 5% OUTPUT CURRENT 1 MA MAX.

d. COLOR COMMAND: A BINARY "0" SHALL BE AVAILABLE TO PRODUCE A BLACK PRINT-OUT ON THE PRINTED.

e. IN "RATIO OR PERIOD", "E/UT X N_1", "TEST N_1" AND "TEST N_2" THE COUNTER SHALL BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2 MA MAX.

f. REMOTE RESET: A REMOTE RESET SHALL BE BROUGHT OUT IN PARALLEL WITH THE FRONT PANEL RESET.

(14) "N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.

(15) "N_2" TIME BASE OUTPUT : BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.

(16) INDICATORS:

a. 6 COLUMNS: DIGITS "0" THRU "9" FOR EACH COLUMN. DISPLAY INDICATES ACCUMULATED COUNT.

b. "+" AND "-" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.

c. "GATE INDICATOR": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.

(17) POWER REQUIREMENTS: 115 AC LINE ± 10%, 60 ± 5 CPS, APPROXIMATELY 100 WATTS.

(18) CLOCK STABILITY: THE INTERNAL CLOCK (100 KC ± 1 CPS) SHALL HAVE A STABILITY OF 2 PARTS IN 10^7 PER DAY AND 5 PARTS IN 10^7 PER WEEK.

(19) OCS TEST: THE INTERNAL CLOCK (100 KC) SHALL BE BROUGHT OUT TO J5 OCS TEST JACK.

2. MECHANICAL SPECIFICATIONS:

A. TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

B. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900032.

C. THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND 1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

D. SURFACES A&B SHALL BE PARALLED WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. DIMENSION "A" SHALL BE EQUAL TO DIMENSION "B" WITHIN .040.

E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

F. WEIGHT: NOT TO EXCEED 50 LBS.

G. BORDER AREA, WITHIN .578/.547 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

H. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.

J. SIGNAL INPUTS, CHASSIS AND POWER LOW SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

K. DATA SOURCE:
BECKMAN INSTRUMENTS INC., BERKELEY DIV.
RICHMOND, CALIFORNIA
REVERSING EPUT METER MODEL 3350/6-6.

L. THE COUNTER SHALL BE ELECTRICALLY COMPATIBLE FOR SIMULTANEOUS USE WITH THE "INDICATOR, COUNTER, REMOTE" PART NUMBER 1900020 AND "PRINTER" PART NUMBER 1900063.

M. ALLOW .500 ± .016 CLEARANCE BEHIND EACH HOLE.

N. CONNECTOR INFORMATION

J5
OSC TEST
BNC UG-1094/U

J4 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL
A	CHASSIS GND
D	INPUT POWER HI
E	INPUT POWER LO

SPARES B, C, F, G, H

J3 SIGNAL INPUT

PIN NO.	SIGNAL	PIN NO.	SIGNAL
A	A INPUT	F	N_1 OUTPUT
B	B INPUT	G	N_2 OUTPUT
C	C INPUT	H	SIGNAL LOW
D	D INPUT	J	SPARE
E	-15V LOW	K	SPARE

N. CONNECTOR INFORMATION (CONTINUED)

J1 SIGNAL OUTPUT
MS3112E22-55S

PIN NO.	SIGNAL		PIN NO.	SIGNAL	
B	1		k	REMOTE RESET	
C	2	DIGIT 1	m	PRINT-OUT COLOR CONTROL	
D	4	OR LSD	n	SPARE	
E	8		$\bar{p}$	SIGN INDICATOR "0"=(+) "1"=(-)	
A	SPARE		r	PRINT COMMAND, CR READOUT CONTROL	
F	SPARE				
G	SPARE		$\bar{s}$	INHIBIT RESET (AN INPUT SIGNAL)	
H	1		t	SIGNAL GROUND	
J	2	DIGIT 2	u	DISPLAY OVER RIDE	
K	4		$\bar{v}$	COMMON, SELECTOR SWITCH	
L	8		$\bar{w}$	A FWD	SIGNALS FROM THE SELECTOR SWITCH
M	SPARE		$\bar{x}$	A REV	
N	SPARE		$\bar{y}$	A - B	
P	1		$\bar{z}$	A + B	
R	2	DIGIT 3	AA	C SENSE	
S	4		BB	COMMON, FUNCTION SWITCH	
T	8		EE	OFF	SIGNALS FROM THE FUNCTION SWITCH
U	SPARE		FF	COUNT	
V	SPARE		CC	RATIO OR PERIOD	
W	1		DD	EPUT X N_1	
X	2	DIGIT 4	GG	TEST N_1	
Y	4		HH	TEST N_2	
Z	8				
a	SPARE				
b	1				
$\bar{c}$	2	DIGIT 5			
d	4				
e	8				
f	SPARE				
g	1				
h	2	DIGIT 6			
i	4	MSD			
j	8				

J2 SIGNAL OUTPUT
MS3112E-22-55 SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS k, m, n, $\bar{s}$, u, $\bar{v}$, $\bar{w}$, $\bar{x}$, y, $\bar{z}$, AA, BB, CC, DD, EE, FF, GG, AND, HH, ARE SPARES.

P. FOR NEW PROCUREMENT ITEM 59 SHALL BE MOUNTED IN LOCATION SHOWN ON SHEET 2 OF 4. ON INITIAL PROCUREMENT ITEM 59 WAS LOCATED AS SHOWN ON SHEET 3 OF 4.

Ⓝ REPLACES REV (M) WITH CHANGE

SEE NOTE 2P

QUANTITY REQUIRED							
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		110	1901731	SCHEMATIC DIAGRAM, ELEC
			2		109	1901751-126	WASHER LOCK
			4		108	1901751-122	SCREW FLAT HD
			1		107	1901751-113	RESISTOR FIXED
			2		106	1901751-100	DIODE
			1		105	1901751-096	CAPACITOR FIXED
			131		104	1901751-128	NUT HEX
			25		103	1901751-125	WASHER LOCK
			8		102	1901751-124	WASHER LOCK
			137		101	1901751-123	WASHER LOCK
			8		100	1901751-120	SCREW PAN HD
			25		99	1901751-119	SCREW PAN HD
			4		98	1901751-118	SCREW PAN HD
			4		97	1901751-117	SCREW PAN HD
			22		96	1901751-116	SCREW PAN HD
			125		95	1901751-115	SCREW PAN HD
			2		94	1901751-135	TERMINAL STRIP
			2		93	1901751-134	TERMINAL STRIP
			6		92	1901751-071	STANDOFF
			1		91	1901751-136	TRANSISTOR
			4		90	1901751-099	DIODE
			1		89	1901751-098	DIODE
			30		88	1901751-097	DIODE
			1		87	1901751-091	CAPACITOR FIXED
			1		86	1901751-090	CAPACITOR FIXED
			3		85	1901751-089	CAPACITOR FIXED
			1		84	1901751-088	CAPACITOR FIXED
			1		83	1901751-110	RESISTOR FIXED
			1		82	1901751-109	RESISTOR FIXED
			1		81	1901751-108	RESISTOR FIXED
			2		80	1901751-107	RESISTOR FIXED
			1		79	1901751-106	RESISTOR FIXED
			20		78	1901751-105	RESISTOR FIXED
			2		77	1901751-068	SHOULDER WASHER
			1		76	1901751-067	FAN SCREEN (INSEP ASSY)
			1		75	1901751-066	FAN BLADE
			1		74	1901751-065	FAN MOTOR
			2		73	1901751-064	FUSE
			2		72	1901751-063	FUSE HOLDER
			1		71	1901751-062	CONNECTOR
			8		70	1901751-061	HYRING
			8		69	1901751-060	SOCKETS
			8		68	1901751-059	CONTACTS
			1		67	1901751-058	CONNECTOR
			1		66	MS3112E16-8P	(1901751-057) CONNECTOR
			1		65	MS3112E22-55SW	(1901751-056) CONNECTOR
			1		64	MS3112E22-55S	(1901751-055) CONNECTOR
			3		63	1901751-054	KNOB CONCENTRIC
			3		62	1901751-053	KNOB MODIFIED
			5		61	1901751-052	KNOB SKIRTED

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED							
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			3		60	1901751-051	SHIELD ATTEN SW
			1		59	1901751-050	DIODE BOARD A
			1		58	1901751-049	BRACKET THUMBWHEEL SWITCH
			6		57	1901751-048	SWITCH THUMBWHEEL
			3		56	1901751-047	SWITCH TOGGLE
			1		55	1901751-046	SWITCH TOGGLE
			2		54	1901751-045	SWITCH ROTARY
			1		53	1901751-044	SWITCH PUSH BUTTON
			2		52	1901751-043	SWITCH TOGGLE
			1		51	1901751-042	SWITCH ROTARY
			1		50	1901751-041	SWITCH ROTARY
			1		49	1901751-040	SWITCH ROTARY
			3		48	1901751-039	ATTENUATOR SWITCH ASSY
			4		47	1901751-038	LAMP 6V INCAND.
			1		46	1901751-037	LAMP HOLDER (GRN)
			1		45	1901751-036	LAMP HOLDER (RED)
			1		44	1901751-035	LAMP HOLDER (-)
			1		43	1901751-034	LAMP HOLDER (+)
			1		42	1901751-033	SOCKET OCTAL
			64		41	1901751-032	BRACKET P.C. BOARD
			9		40	1901751-031	CONDUCTOR P.C. BOARD 18 PIN
			29		39	1901751-030	CONNECTOR P.C. BOARD 15 PIN
			1		38	1901751-029	RELAY BOARD ASSY
			1		37	1901751-028	OUTPUT DIODE BOARD ASSY
			1		36	1901751-027	LOGIC EYELET BOARD ASSY
			1		35	1901751-026	RESET DIODE BOARD ASSY
			1		34	1901751-025	SHIELD BOTTOM B
			2		33	1901751-024	SHIELD BOTTOM A
			3		32	1901751-023	SHIELD TOP
			1		31	1901751-022	P.C. EXTENSION 15 PIN
			1		30	1901751-021	P.C. EXTENSION 18 PIN
			1		29	1901751-020	BRACKET EXTENSION BOARD
			1		28	1901751-019	BRACKET EXTENSION BOARD
			1		27	1901751-018	RELAY HGP
			1		26	1901751-015	RESET P.C. ASSY
			1		25	1901751-014	DRIVER P.C. ASSY
			1		24	1901751-013	POLARITY DETECTION NO.2 P.C. ASSY
			1		23	1901751-012	POLARITY DETECTION NO.1 P.C. ASSY
			1		22	1901751-011	TIME BASE P.C. ASSY
			1		21	1901751-010	SENSE P.C. ASSY
			1		20	1901751-009	INPUT P.C. ASSY
			1		19	1901751-008	CONTROL P.C. ASSY
			1		18	1901751-007	BUFFER P.C. ASSY
			1		17	1901751-006	AUXILIARY P.C. ASSY
			3		16	1901751-005	AMPLIFIER P.C. ASSY
			2		15	1901751-004	760 A DCU P.C. ASSY
			6		14	1901751-003	752 B DCU P.C. ASSY
			6		13	1901751-002	751 A DCI P.C. ASSY
			11		12	1901751-001	750 A DCU P.C. ASSY
			1		11	1901741-011	1 MC OSCILLATOR ASSY
			1		10	1901747-011	POWER SUPPLY ASSY
			1		9	1901735	COVER BOTTOM
			1		8	1901734	COVER TOP
			1		7	1901737	BRACKET RIGHT
			1		6	1901736	BRACKET LEFT
			1		5	1901739	SIDE GUSSET LEFT
			1		4	1901738	SIDE GUSSET RIGHT
			1		3	1901733	PANEL REAR
			1		2	1901732	FRONT PANEL
			1		1	1901750	CHASSIS (INSEP ASSY)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011	1901976-011	-011
1900041-011	1900004-021	-011
1900041-011	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

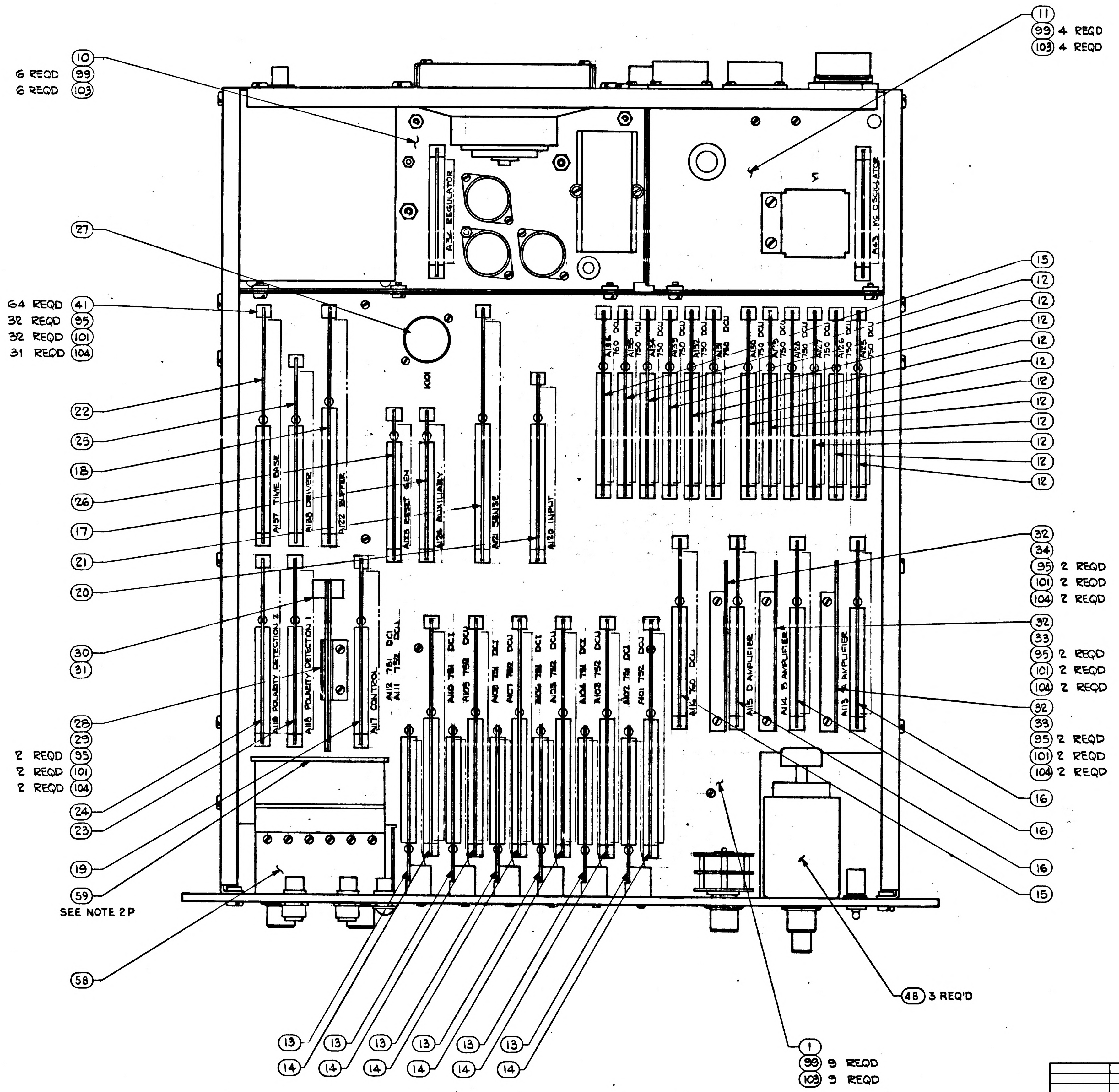
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 11 Nov 64
CHECKED 22 MAR 65
APPROVAL R. E. Guese 22 MAR 65
APPROVAL E. Feldman 6/2/65
NASA APPROVAL
MIT APPROVAL M. G. Murphy 6-16-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO. 99974
SIZE E
1900032
SCALE FULL
SHEET 1 OF 4

REVISIONS			TDRR OC 998		
SYM	ZONE	DESCRIPTION		DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	CHG NO. —	2 JUNE 65	DKD



10
6 REQD 99
6 REQD 103
11
99 4 REQD
103 4 REQD
A34 REGULATOR
A43 1MC OSCILLATOR
Y1
27
K101
64 REQD 41
32 REQD 95
32 REQD 101
31 REQD 104
22
25
18
26
17
21
20
A137 TIME BASE
A136 DRIVER
A122 BUFFER
A123 RESET GEN
A124 AUXILIARY
A121 SENSE
A120 INPUT
A136 760 DCU
A135 750 DCU
A134 750 DCU
A133 750 DCU
A132 750 DCU
A131 750 DCU
A130 750 DCU
A129 750 DCU
A128 750 DCU
A127 750 DCU
A126 750 DCU
A125 750 DCU
15
12
12
12
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12
12
12
12
12
12
30
31
28
29
2 REQD 95
2 REQD 101
2 REQD 104
24
23
19
59
SEE NOTE 2P
58
A119 POLARITY DETECTION 2
A118 POLARITY DETECTION 1
A117 CONTROL
A112 751 DCI
A111 752 DCU
A110 751 DCI
A105 752 DCU
A108 751 DCI
A107 752 DCU
A106 751 DCI
A135 752 DCU
A104 751 DCI
A103 752 DCU
A102 751 DCI
A101 752 DCU
A116 760 DCU
A115 D AMPLIFIER
A114 B AMPLIFIER
A113 A AMPLIFIER
32
34
95 2 REQD
101 2 REQD
104 2 REQD
32
33
95 2 REQD
101 2 REQD
104 2 REQD
32
33
95 2 REQD
101 2 REQD
104 2 REQD
16
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13
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13
13
14
14
14
14
14
14
1
99 9 REQD
103 9 REQD
48 3 REQ'D

Ⓝ REPLACES REV (M) WITH CHANGE

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — ± — ± —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
			DRAWN 11 Nov 64 DATE CHECKED 3-8-65 3-8-65 APPROVAL K E Juss APPROVAL 6/2/65	COUNTER
		DO NOT SCALE THIS DRAWING		
		MATERIAL —	NASA APPROVAL 6/2/65 MIT APPROVAL M G Marks 6/4/65	CODE IDENT NO. 99974 · SIZE E · 1900032
NEXT ASSY	USED ON			
APPLICATION		CONTRACT NAS-9-497		SCALE FULL · SHEET 2 OF 4

REVISIONS					TORR C0398
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
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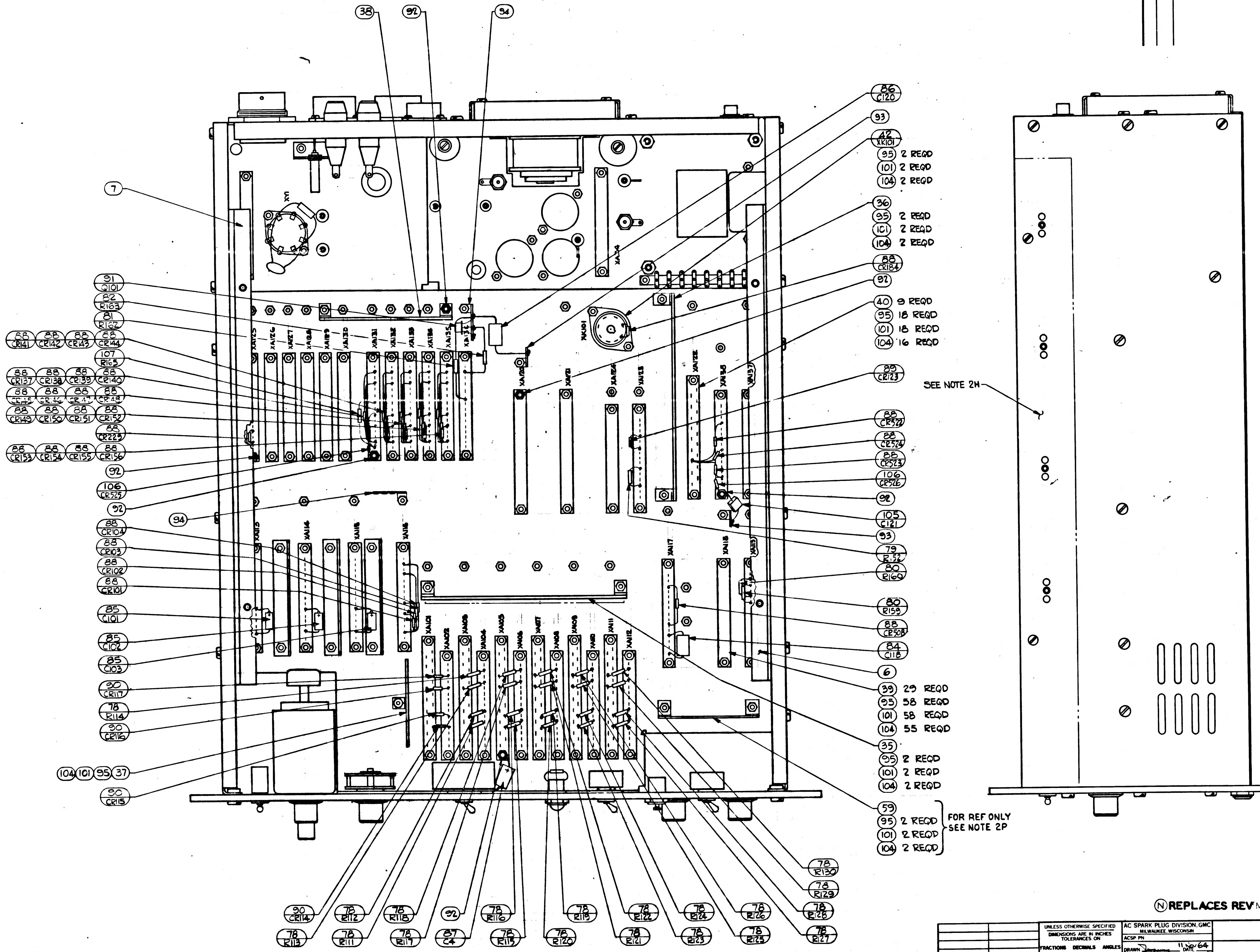

38
92
94
7
86 C120
93
42 XK101
95 2 REQD
101 2 REQD
104 2 REQD
36
95 2 REQD
101 2 REQD
104 2 REQD
88 CR184
92
40 9 REQD
95 18 REQD
101 18 REQD
104 16 REQD
89 CR123
SEE NOTE 2H
88 CR522
88 CR524
88 CR523
106 CR526
92
105 C121
93
79 R152
80 R160
80 R159
88 CR508
84 C118
6
39 29 REQD
95 58 REQD
101 58 REQD
104 55 REQD
35
95 2 REQD
101 2 REQD
104 2 REQD
59
95 2 REQD
101 2 REQD
104 2 REQD
FOR REF ONLY SEE NOTE 2P
78 R130
78 R129
78 R128
78 R127
78 R126
78 R125
78 R124
78 R123
78 R122
78 R121
78 R119
78 R120
78 R116
78 R115
87 C4
92
78 R118
78 R117
78 R112
78 R111
90 CR114
78 R113
91 Q101
82 R163
81 R162
88 CR141
88 CR142
88 CR143
88 CR144
107 R165
88 CR137
88 CR138
88 CR139
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88 CR146
88 CR147
88 CR148
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88 CR151
88 CR152
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88 CR155
88 CR156
92
106 CR525
92
94
88 CR104
88 CR103
88 CR102
88 CR101
85 C101
85 C102
85 C103
90 CR117
78 R114
90 CR116
104 101 95 37
90 CR115
XY1
XA125
XA126
XA127
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XA118
XA119
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XA101
XA102
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XA104
XA105
XA106
XA107
XA108
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XA110
XA111
XA112

Ⓝ REPLACES REV Ⓜ WITH CHANGE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

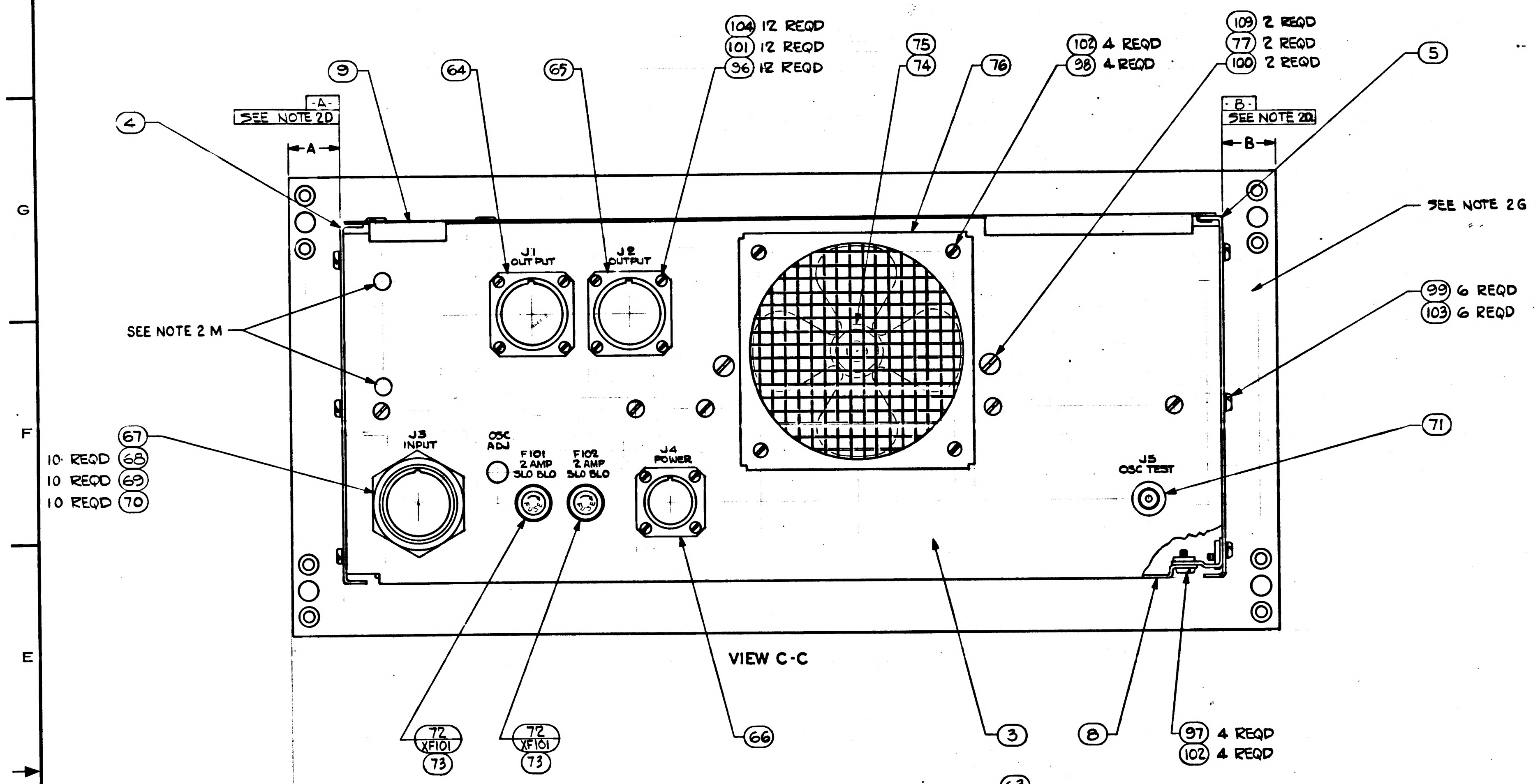
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 11 Nov 64
3-8-65
CHECKED 3-8-65
APPROVAL K.E. Juras
APPROVAL
NASA APPROVAL
MIT APPROVAL 6-28-65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

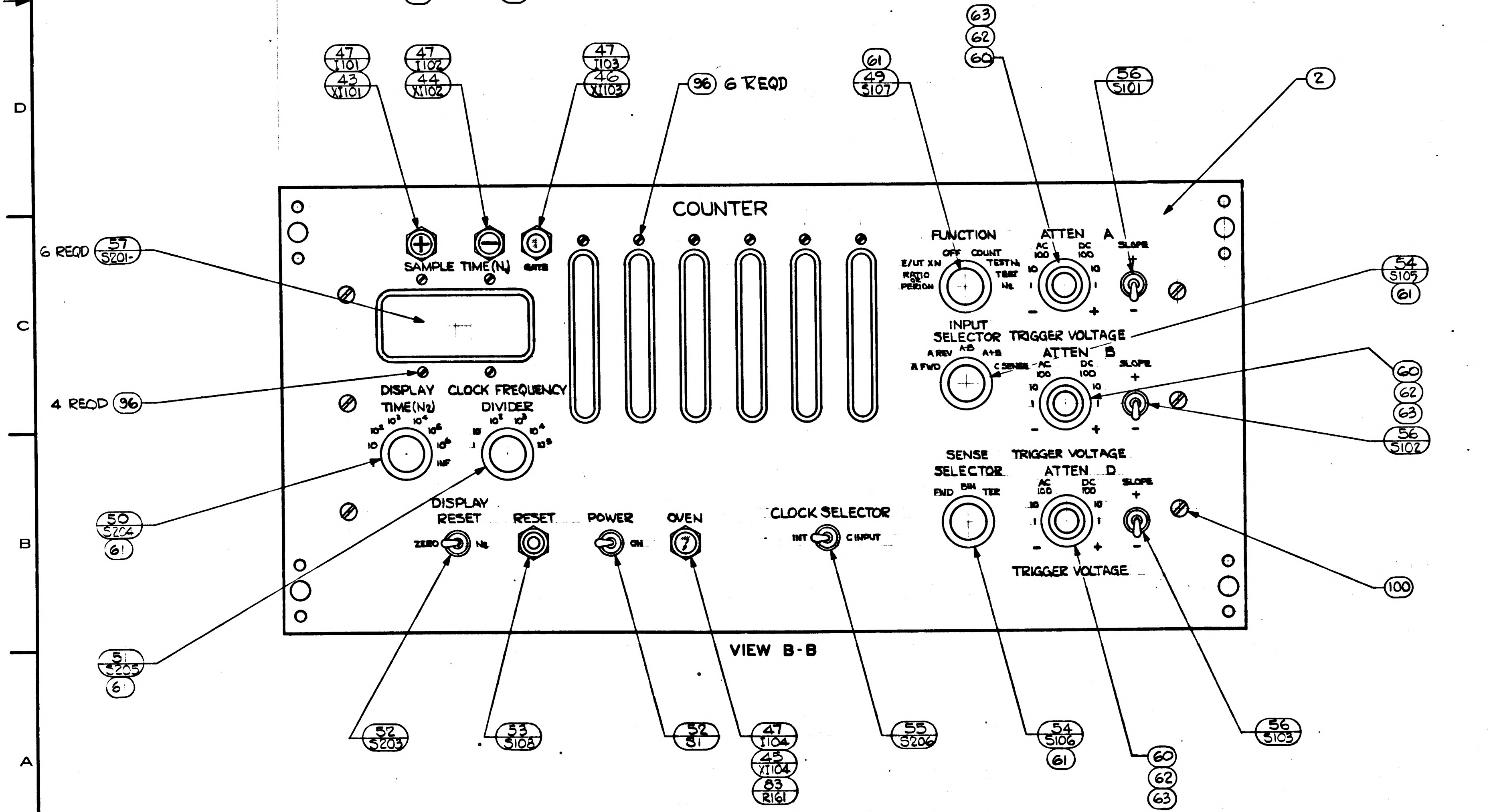
CODE IDENT NO. 99974
SIZE E
1900032
SCALE Full
SHEET 3 OF 4

REVISIONS					TDRR 00992E
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	CKD



9
64
65
104 12 REQD
101 12 REQD
96 12 REQD
75
74
76
102 4 REQD
98 4 REQD
109 2 REQD
77 2 REQD
100 2 REQD
5
4
-A- SEE NOTE 2D
-B- SEE NOTE 2D
SEE NOTE 2G
99 6 REQD
103 6 REQD
SEE NOTE 2 M
J1 OUTPUT
J2 OUTPUT
67
10 REQD 68
10 REQD 69
10 REQD 70
J3 INPUT
OSC ADJ
F101 2 AMP SLO BLO
F102 2 AMP SLO BLO
J4 POWER
J5 OSC TEST
71
72 XF101 73
72 XF101 73
66
3
8
97 4 REQD
102 4 REQD

VIEW C-C



47 I101 43 XI101
47 I102 44 XI102
47 I103 46 XI103
96 6 REQD
61 49 S107
63 62 60
56 S101
2
COUNTER
SAMPLE TIME(N1)
GATE
FUNCTION
OFF COUNT
E/UT XN RATIO PERIOD
TEST N1 TEST N2
ATTEN A
AC 100 DC 100
10 10
1 1
SLOPE
6 REQD 57 S201
54 S105 61
INPUT SELECTOR
TRIGGER VOLTAGE
A REV A-B A+B
A FWD C SENSE
ATTEN B
60 62 63
56 S102
4 REQD 96
DISPLAY TIME(N2)
CLOCK FREQUENCY DIVIDER
10 10² 10³ 10⁴ 10⁵ INF
1 10 10² 10³ 10⁵
SENSE SELECTOR
FWD BIN TER
TRIGGER VOLTAGE
ATTEN D
50 S204 61
51 S205 61
DISPLAY RESET
ZERO N2
RESET
POWER
ON
OVEN
CLOCK SELECTOR
INT C INPUT
100
52 S203
53 S108
52 S1
47 I104 45 XI104 83 R161
55 S206
54 S106 61
60 62 63
56 S103

VIEW B-B

Ⓝ REPLACES REV(M) WITH CHANGE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 11 Nov 64
CHECKED 3-8-65
APPROVAL K E [illegible] 3-8-65
APPROVAL [illegible] 6/21/65
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 6-28-65

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO. 99974
SIZE E
1900032
SCALE FULL
SHEET 4 OF 4

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	DKD
P		REVISED PER TDRR 22676		18 OCT 65	

REVISIONS TDRR 00998

REQUIREMENTS:

1. ELECTRICAL SPECIFICATIONS:

A. "INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:

(1) "A FWD": INPUT (2 MC MAX) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.

(2) "A REV": "A" INPUT (100 KC MAX) IS COUPLED TO THE "FUNCTION SWITCH. COUNTING IS FORWARD ONLY BUT THE "-" POLARITY LAMP IS LIT.

(3) "A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 50µS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.

(4) "A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 20µS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.

(5) "C-SENSE": THE INTERNAL (100 KC) CLOCK IS FED THRU THE "CLOCK FREQUENCY DIVIDER" TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.

B. "FUNCTION", ROTARY SWITCH WITH THE FOLLOWING POSITIONS:

(1) "RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 µS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES OF THE INTERNAL (100 KC) CLOCK, AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C - SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION. IN THE "PERIOD" FUNCTION THE COUNT GATE REMAINS OPEN FOR A LENGTH OF TIME DETERMINED BY "N" "D" PULSES, AND DURING THE GATE OPEN TIME THE CLOCK PULSES FROM THE "CLOCK FREQUENCY DIVIDER", VIA "C - SENSE" POSITION OF THE "INPUT SELECTOR", ARE COUNTED.

(2) "EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT - GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE "CLOCK FREQUENCY DIVIDER". THE COUNT - ACCUMULATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE INTERNAL (100 KC) CLOCK AFTER WHICH THE INSTRUMENT AUTOMATICALLY RESETS AND RECYCLES.

(3) "TEST N_1": THE INTERNAL (100 KC) CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE "CLOCK FREQUENCY DIVIDER". THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.

(4) OFF: SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE WHICH IS HELD PERMANENTLY CLOSED AND NO COUNTS ARE ACCUMULATED.

(5) "TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 PULSES FROM THE "CLOCK FREQUENCY DIVIDER".

(6) "COUNT": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED COUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET BUTTON ONLY.

C. "SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999"

D. "DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS: - "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" AND "INF". (INFINITE DISPLAY TIME WITH MANUAL RESET).

E. "DISPLAY RESET": EXCEPT IN THE "TEST", "OFF", AND "COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE INTERNAL CLOCK (100 KC). AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS (EXCEPT IN THE "INF" POSITION) AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT PANEL ROTARY SWITCH.

(1) "ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.

(2) "N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.

(3) * ON 10^6 POSITION COUNTER RESETS TO ZERO.

F. "SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.

(1) "FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" AND "B" INPUT CONDITIONS.

(2) "BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12V).

(3) "TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" AND "B" INPUT CHANNELS, AS FOLLOWS:

a. IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.

b. WHEN "A" CHANNEL OUTPUT IS "1" AND "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.

c. WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE REVERSE.

(4) "CLOCK FREQUENCY DIVIDER": A 6-POSITION ROTARY SWITCH WHICH DIVIDES THE INTERNAL (100 KC) CLOCK AND THE "C" INPUT BY ONE OF THE FOLLOWING FACTORS "1", "10", "10^2", "10^3", "10^4", "10^5".

(5) INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.

a. "ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).

b. "TRIGGER-VOLTAGE" "+" "-": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.

c. "SLOPE" CONTROL "+" AND "-": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.

(6) "RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.

(7) "POWER-ON": TOGGLE SWITCH.

(8) "CLOCK SELECTOR": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.

(9) "A" INPUT"

a. COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.

b. SENSITIVITY: 100 MV RMS.

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(10) "B" INPUT"

a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.

b. SENSITIVITY: 100 MV RMS.

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(11) "C" INPUT:

a. INPUT RATE: 10 CPS TO 100 KC.

b. INPUT RANGE: 1 VOLT TO 28 VOLTS RMS

c. SENSITIVITY: 1 VOLT RMS.

d. IMPEDANCE: 1.00 KΩ MIN.

(12) "D" INPUT:

a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED TO 10 CPS TO 100 KC.

b. SENSITIVITY: 100 MV RMS

c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.

(13) CONNECTOR OUTPUTS:

a. DIGITS: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION $-.2^{+.3}_{-.1}$ VOLTS FOR BINARY "1" AND -12.5 ± 1 VOLT FOR BINARY "0" OUTPUT IMPEDANCE 100 KΩ ± 10%. OUTPUT CURRENT 50 MICRO AMPS MAX.

b. PRINT COMMAND: A DC CHANGE FROM BINARY "1" TO BINARY "0" SHALL BE AVAILABLE WHEN THE COUNT GATE CLOSES .35 KΩ OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA.

c. POLARITY COMMAND: A BINARY "0" SHALL REPRESENT A "+" POLARITY AND A BINARY "1" SHALL REPRESENT A "-" POLARITY. -12.5 ± 1 VOLT FOR BINARY "0". $-.2^{+.3}_{-.1}$ VOLT FOR BINARY "1". OUTPUT IMPEDANCE 1 KΩ ± 5% OUTPUT CURRENT 1 MA MAX.

d. COLOR COMMAND: A BINARY "0" SHALL BE AVAILABLE TO PRODUCE A BLACK PRINT-OUT ON THE PRINTED.

e. IN "RATIO OR PERIOD", "E/UT X N_1", "TEST N_1" AND "TEST N_2" THE COUNTER SHALL BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2 MA MAX.

f. REMOTE RESET: A REMOTE RESET SHALL BE BROUGHT OUT IN PARALLEL WITH THE FRONT PANEL RESET.

(14) "N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.

(15) "N_2" TIME BASE OUTPUT : BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.

(16) INDICATORS:

a. 6 COLUMNS: DIGITS "0" THRU "9" FOR EACH COLUMN. DISPLAY INDICATES ACCUMULATED COUNT.

b. "+" AND "-" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.

c. "GATE INDICATOR": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.

(17) POWER REQUIREMENTS: 115 AC LINE ± 10%, 60 ± 5 CPS, APPROXIMATELY 100 WATTS.

(18) CLOCK STABILITY: THE INTERNAL CLOCK (100 KC ± 1 CPS) SHALL HAVE A STABILITY OF 2 PARTS IN 10^7 PER DAY AND 5 PARTS IN 10^7 PER WEEK.

(19) OCS TEST: THE INTERNAL CLOCK (100 KC) SHALL BE BROUGHT OUT TO J5 OCS TEST JACK.

G. THE SCHEMATIC DIAGRAM, ELEC. IS FOR REFERENCE ONLY.

2. MECHANICAL SPECIFICATIONS:

A. TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

B. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900032.

C. THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND 1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

D. SURFACES A&B SHALL BE PARALLED WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. DIMENSION "A" SHALL BE EQUAL TO DIMENSION "B" WITHIN .040.

E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

F. WEIGHT: NOT TO EXCEED 50 LBS.

G. BORDER AREA, WITHIN .578/.547 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

H. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.

J. SIGNAL INPUTS, CHASSIS AND POWER LOW SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

K. DATA SOURCE:
BECKMAN INSTRUMENTS INC., BERKELEY DIV.
RICHMOND, CALIFORNIA
REVERSING EPUT METER MODEL 3350/6-6.

L. THE COUNTER SHALL BE ELECTRICALLY COMPATIBLE FOR SIMULTANEOUS USE WITH THE "INDICATOR, COUNTER, REMOTE" PART NUMBER 1900020 AND "PRINTER" PART NUMBER 1900063.

M. ALLOW .500 ± .016 CLEARANCE BEHIND EACH HOLE.

N. CONNECTOR INFORMATION

J5
OSC TEST
BNC UG-1094/U

J4 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL
A	CHASSIS GND
D	INPUT POWER HI
E	INPUT POWER LO

SPARES B, C, F, G, H

J3 SIGNAL INPUT

PIN NO.	SIGNAL	PIN NO.	SIGNAL
A	A INPUT	F	N_1 OUTPUT
B	B INPUT	G	N_2 OUTPUT
C	C INPUT	H	SIGNAL LOW
D	D INPUT	J	SPARE
E	-15V LOW	K	SPARE

N. CONNECTOR INFORMATION (CONTINUED)

J1 SIGNAL OUTPUT
MS3112E22-55S

PIN NO.	SIGNAL	PIN NO.	SIGNAL
B	1	k	REMOTE RESET
C	2 DIGIT 1	m	PRINT-OUT COLOR CONTROL
D	4 OR LSD	n	SPARE
E	8	$\bar{p}$	SIGN INDICATOR "0"=(+) "1"=(-)
A	SPARE	r	PRINT COMMAND, CR READOUT CONTROL
F	SPARE		
G	SPARE	$\bar{s}$	INHIBIT RESET (AN INPUT SIGNAL)
H	1	t	SIGNAL GROUND
J	2 DIGIT 2	u	DISPLAY OVER RIDE
K	4	$\bar{v}$	COMMON, SELECTOR SWITCH
L	8	$\bar{w}$	A FWD } SIGNALS FROM THE SELECTOR SWITCH
M	SPARE	$\bar{x}$	A REV
N	SPARE	$\bar{y}$	A - B
P	1	$\bar{z}$	A + B
R	2 DIGIT 3	AA	C SENSE
S	4	BB	COMMON, FUNCTION SWITCH
T	8	EE	OFF } SIGNALS FROM THE FUNCTION SWITCH
U	SPARE	FF	COUNT
V	SPARE	CC	RATIO OR PERIOD
W	1	DD	EPUT X N_1
X	2 DIGIT 4	GG	TEST N_1
Y	4	HH	TEST N_2
Z	8		
a	SPARE		
b	1		
$\bar{c}$	2 DIGIT 5		
d	4		
e	8		
f	SPARE		
g	1		
h	2 DIGIT 6		
i	4 MSD		
j	8		

J2 SIGNAL OUTPUT
MS3112E-22-55 SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS k, m, n, $\bar{s}$, u, $\bar{v}$, $\bar{w}$, $\bar{x}$, y, $\bar{z}$, AA, BB, CC, DD, EE, FF, GG, AND, HH, ARE SPARES.

P. FOR NEW PROCUREMENT ITEM 59 SHALL BE MOUNTED IN LOCATION SHOWN ON SHEET 2 OF 4. ON INITIAL PROCUREMENT ITEM 59 WAS LOCATED AS SHOWN ON SHEET 3 OF 4.

Ⓝ REPLACES REV(M) WITH CHANGE

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 16.	X		110	1901731	SCHEMATIC DIAGRAM, ELEC
	2		109	1901751- 26	WASHER LOCK
	4		108	1901751-122	SCREW FLAT HD
	1		107	1901751-113	RESISTOR FIXED
	2		106	1901751-100	DIODE
	1		105	1901751-096	CAPACITOR FIXED
	131		104	1901751-128	NUT HEX
	25		103	1901751-125	WASHER LOCK
	8		102	1901751-124	WASHER LOCK
	137		101	1901751-123	WASHER LOCK
	8		100	1901751-120	SCREW PAN HD
	25		99	1901751-119	SCREW PAN HD
	4		98	1901751-118	SCREW PAN HD
	4		97	1901751-117	SCREW PAN HD
	22		96	1901751-116	SCREW PAN HD
	125		95	1901751-115	SCREW PAN HD
	2		94	1901751-135	TERMINAL STRIP
	2		93	1901751-134	TERMINAL STRIP
	6		92	1901751-071	STANDOFF
	1		91	1901751-136	TRANSISTOR
	4		90	1901751-099	DIODE
	1		89	1901751-098	DIODE
	30		88	1901751-097	DIODE
	1		87	1901751-091	CAPACITOR FIXED
	1		86	1901751-090	CAPACITOR FIXED
	3		85	1901751-089	CAPACITOR FIXED
	1		84	1901751-088	CAPACITOR FIXED
	1		83	1901751-110	RESISTOR FIXED
	1		82	1901751-109	RESISTOR FIXED
	1		81	1901751-108	RESISTOR FIXED
	2		80	1901751-107	RESISTOR FIXED
	1		79	1901751-106	RESISTOR FIXED
	20		78	1901751-105	RESISTOR FIXED
	2		77	1901751-068	SHOULDER WASHER
	1		76	1901751-067	FAN SCREEN (INSEP ASSY)
	1		75	1901751-066	FAN BLADE
	1		74	1901751-065	FAN MOTOR
	2		73	1901751-064	FUSE
	2		72	1901751-063	FUSE HOLDER
	1		71	1901751-062	CONNECTOR
	8		70	1901751-061	HYRING
	8		69	1901751-060	SOCKETS
	8		68	1901751-059	CONTACTS
	1		67	1901751-058	CONNECTOR
	1		66	MS3112E16-8P	(1901751-057) CONNECTOR
	1		65	MS3112E22-55SW	(1901751-056) CONNECTOR
	1		64	MS3112E22-55S	(1901751-055) CONNECTOR
	3		63	1901751-054	KNOB CONCENTRIC
	3		62	1901751-053	KNOB MODIFIED
	5		61	1901751-052	KNOB SKIRTED
	3		60	1901751-051	SHIELD ATTEN SW
SEE NOTE 2P	1		59	1901751-050	DIODE BOARD A
	1		58	1901751-049	BRACKET THUMBWHEEL SWITCH
	6		57	1901751-048	SWITCH THUMBWHEEL
	3		56	1901751-047	SWITCH TOGGLE
	1		55	1901751-046	SWITCH TOGGLE
	2		54	1901751-045	SWITCH ROTARY
	1		53	1901751-044	SWITCH PUSH BUTTON
	2		52	1901751-043	SWITCH TOGGLE
	1		51	1901751-042	SWITCH ROTARY
	1		50	1901751-041	SWITCH ROTARY
	1		49	1901751-040	SWITCH ROTARY
	3		48	1901751-039	ATTENUATOR SWITCH ASSY
	4		47	1901751-038	LAMP 6V INCAND.
	1		46	1901751-037	LAMP HOLDER (GRN)
	1		45	1901751-036	LAMP HOLDER (RED)
	1		44	1901751-035	LAMP HOLDER (-)
	1		43	1901751-034	LAMP HOLDER (+)
	1		42	1901751-033	SOCKET OCTAL
	64		41	1901751-032	BRACKET P.C. BOARD
	9		40	1901751-031	CONDUCTOR P.C. BOARD 18 PIN
	29		39	1901751-030	CONNECTOR P.C. BOARD 15 PIN
	1		38	1901751-029	RELAY BOARD ASSY
	1		37	1901751-028	OUTPUT DIODE BOARD ASSY
	1		36	1901751-027	LOGIC EYELET BOARD ASSY
	1		35	1901751-026	RESET DIODE BOARD ASSY
	1		34	1901751-025	SHIELD BOTTOM B
	2		33	1901751-024	SHIELD BOTTOM A
	3		32	1901751-023	SHIELD TOP
	1		31	1901751-022	P.C. EXTENSION 15 PIN
	1		30	1901751-021	P.C. EXTENSION 18 PIN
	1		29	1901751-020	BRACKET EXTENSION BOARD
	1		28	1901751-019	BRACKET EXTENSION BOARD
	1		27	1901751-018	RELAY HGP
	1		26	1901751-015	RESET P.C. ASSY
	1		25	1901751-014	DRIVER P.C. ASSY
	1		24	1901751-013	POLARITY DETECTION NO.2 P.C. ASSY
	1		23	1901751-012	POLARITY DETECTION NO.1 P.C. ASSY
	1		22	1901751-011	TIME BASE P.C. ASSY
	1		21	1901751-010	SENSE P.C. ASSY
	1		20	1901751-009	INPUT P.C. ASSY
	1		19	1901751-008	CONTROL P.C. ASSY
	1		18	1901751-007	BUFFER P.C. ASSY
	1		17	1901751-006	AUXILIARY P.C. ASSY
	3		16	1901751-005	AMPLIFIER P.C. ASSY
	2		15	1901751-004	760 A DCU P.C. ASSY
	6		14	1901751-003	752 B DCU P.C. ASSY
	6		13	1901751-002	751 A DCI P.C. ASSY
	11		12	1901751-001	750 A DCU P.C. ASSY
	1		11	1901741-011	1 MC OSCILLATOR ASSY
	1		10	1901747-011	POWER SUPPLY ASSY
	1		9	1901735	COVER BOTTOM
	1		8	1901734	COVER TOP
	1		7	1901737	BRACKET RIGHT
	1		6	1901736	BRACKET LEFT
	1		5	1901739	SIDE GUSSET LEFT
	1		4	1901738	SIDE GUSSET RIGHT
	1		3	1901733	PANEL REAR
	1		2	1901732	FRONT PANEL
	1		1	1901750	CHASSIS (INSEP ASSY)

APPLICATION

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011	1901976-011	-011
1900041-011	1900004-021	-011
1900041-011	1900004-011	-011

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

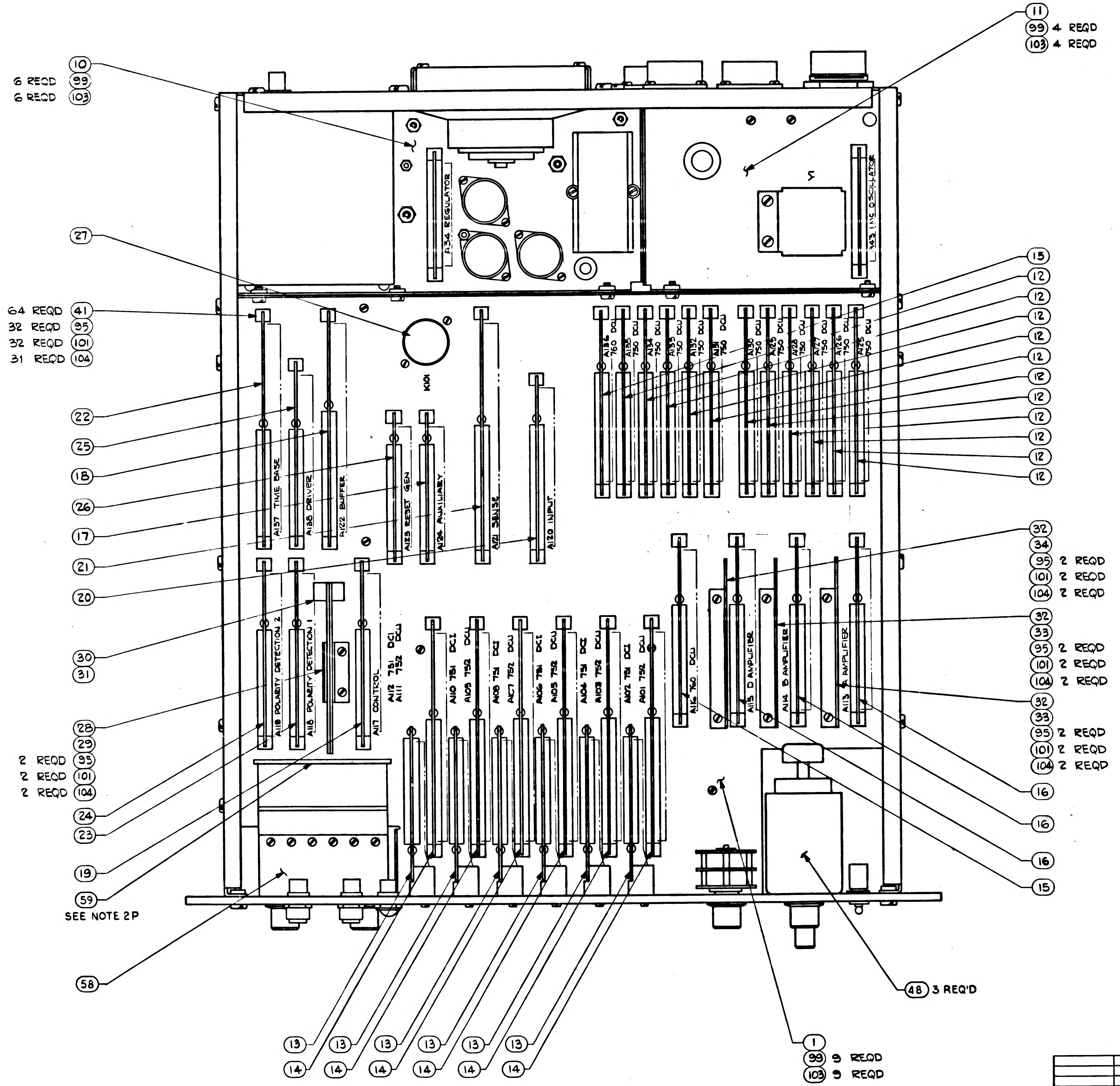
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 11 Nov 64
CHECKED 22 MAR 65
APPROVAL K E Gunse 22 MAR 65
APPROVAL 6/21/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO. 99974
SIZE E
1900032
SCALE FULL
SHEET 1 OF 4

REVISIONS					TDRR OC 99E
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	CKD
P		REVISION STATUS CHANGED		1 OCT 65	



10
6 REQD 99
6 REQD 103
11
99 4 REQD
103 4 REQD
A34 REGULATOR
A43 1 MC OSCILLATOR
27
K101
64 REQD 41
32 REQD 95
32 REQD 101
31 REQD 104
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2 REQD 95
2 REQD 101
2 REQD 104
24
23
19
59
SEE NOTE 2P
58
A137 TIME BASE
A138 DRIVER
A122 BUFFER
A123 RESET GEN
A124 AUXILIARY
A121 SENSE
A120 INPUT
A136 760 DCU
A135 750 DCU
A134 750 DCU
A133 750 DCU
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A129 750 DCU
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A127 750 DCU
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A125 750 DCU
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A119 POLARITY DETECTION 2
A118 POLARITY DETECTION 1
A117 CONTROL
A112 751 DCI
A111 752 DCU
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A104 751 DCI
A103 752 DCU
A102 751 DCI
A101 752 DCU
A116 760 DCU
A115 D AMPLIFIER
A114 B AMPLIFIER
A113 A AMPLIFIER
32
34
95 2 REQD
101 2 REQD
104 2 REQD
32
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95 2 REQD
101 2 REQD
104 2 REQD
32
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95 2 REQD
101 2 REQD
104 2 REQD
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48 3 REQ'D
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99 9 REQD
103 9 REQD

Ⓝ REPLACES REV M WITH CHANGE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 11 Nov 64
CHECKED 3-8-65
APPROVAL K E [illegible] 3-9-65
APPROVAL [illegible]
NASA APPROVAL
MIT APPROVAL

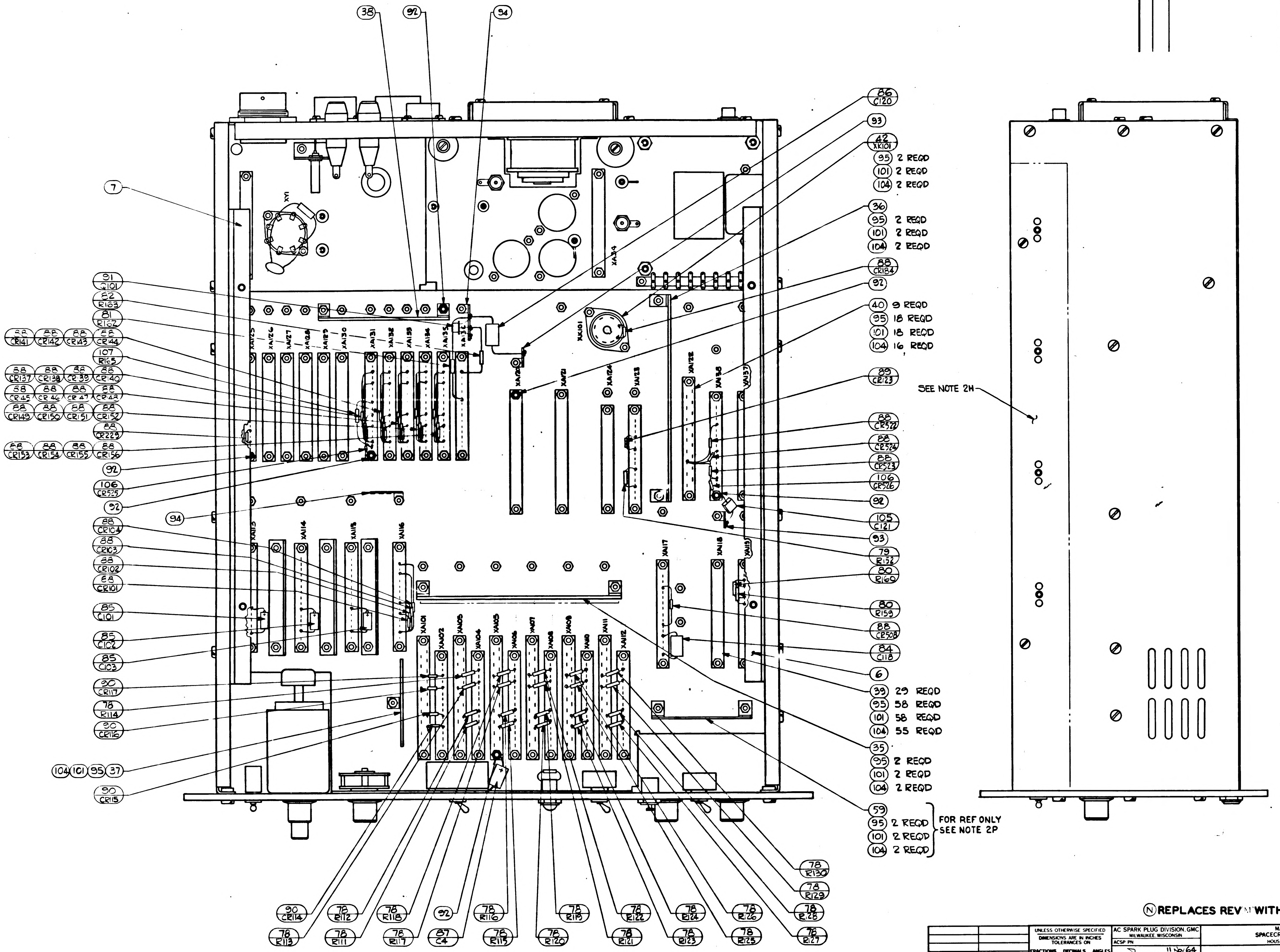
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO	SIZE	
99974	E	1900032
SCALE Full		SHEET 2 OF 4

1900032

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
		REVISIONS TORR C0398			
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	DKD
P		REVISION STATUS CHANGED		1 OCT 65	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85 C102
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78 R127
78 R128
78 R129
78 R130
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101 2 REQD
104 2 REQD
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95 2 REQD
101 2 REQD
104 2 REQD
88 CR184
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40 9 REQD
95 18 REQD
101 18 REQD
104 16 REQD
89 CR123
88 CR522
88 CR524
88 CR523
106 CR526
92
105 C121
93
79 R152
80 R160
80 R159
88 CR508
84 C118
6
39 29 REQD
95 58 REQD
101 58 REQD
104 55 REQD
35
95 2 REQD
101 2 REQD
104 2 REQD
59
95 2 REQD
101 2 REQD
104 2 REQD
FOR REF ONLY
SEE NOTE 2P
SEE NOTE 2H
XY1
XA134
XK101
XA125
XA126
XA127
XA128
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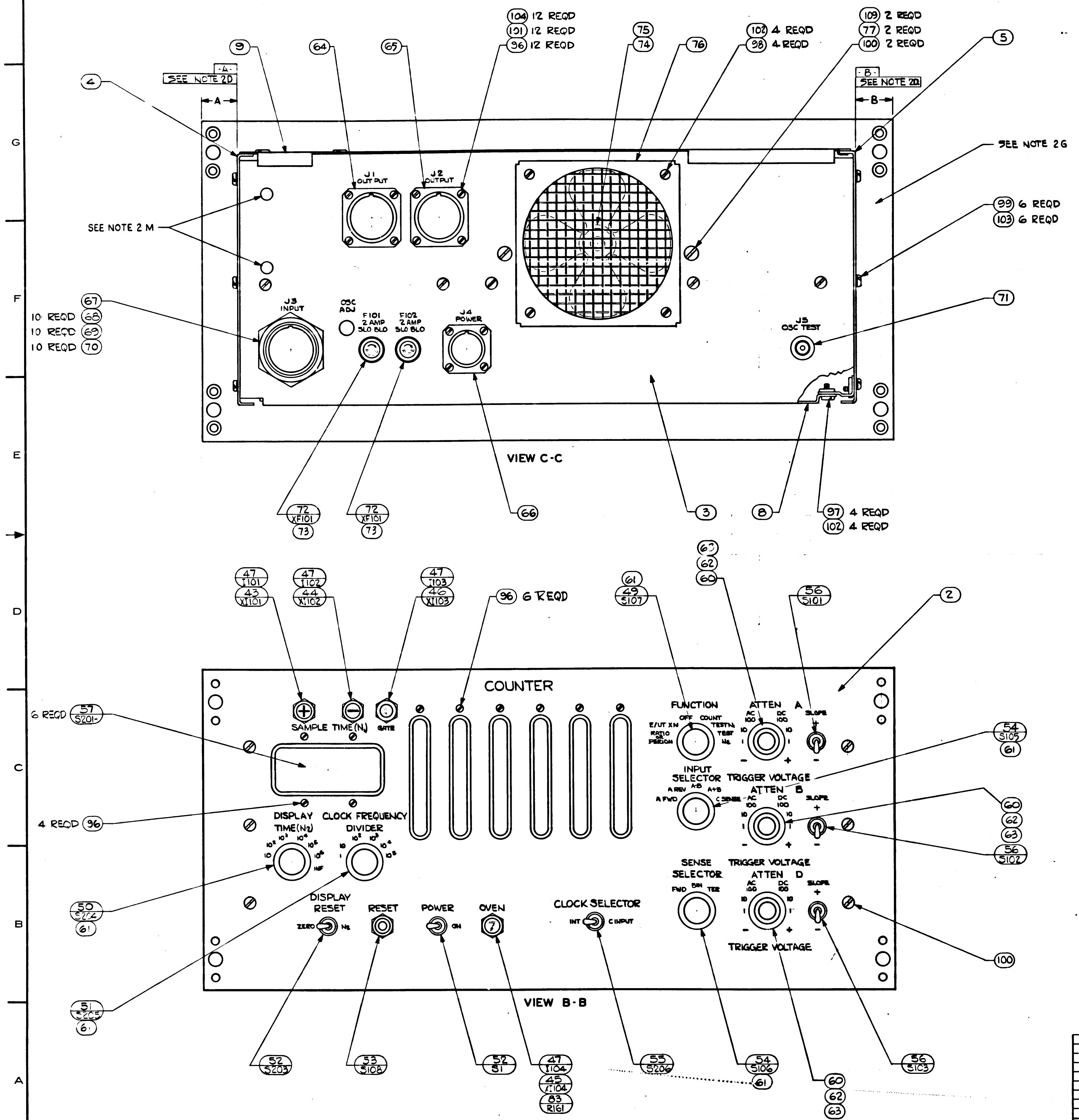
Ⓝ**REPLACES REV M WITH CHANGE**

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN DATE 11 Nov 64 3-5-65 CHECKED 3-8-65 APPROVAL K E APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS COUNTER
APPLICATION		MATERIAL CONTRACT NAS-9-497	NASA APPROVAL MIT APPROVAL 6 28 65	CODE IDENT NO 99974 SIZE E 1900032 SCALE FULL SHEET 3 OF 4

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
REVISIONS					TDRR 0099E
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	CKD
P		REVISION STATUS CHANGED		1 OCT 65	JWP

Ⓝ


(4)
-A-
SEE NOTE 2D
A
(9)
(64)
(65)
(104) 12 REQD
(101) 12 REQD
(96) 12 REQD
(75)
(74)
(76)
(102) 4 REQD
(98) 4 REQD
(109) 2 REQD
(77) 2 REQD
(100) 2 REQD
(5)
-B-
SEE NOTE 2D
B
SEE NOTE 2G
SEE NOTE 2 M
J1 OUTPUT
J2 OUTPUT
(99) 6 REQD
(103) 6 REQD
(67)
10 REQD (68)
10 REQD (69)
10 REQD (70)
J3 INPUT
OSC ADJ
F101 2 AMP SLO BLO
F102 2 AMP SLO BLO
J4 POWER
J5 OSC TEST
(71)
VIEW C-C
(72) XF101 (73)
(72) XF101 (73)
(66)
(3)
(8)
(97) 4 REQD
(102) 4 REQD
(47) I101 (43) XI101
(47) I102 (44) XI102
(47) I103 (46) XI103
(96) 6 REQD
(61) (49) S107
(63) (62) (60)
(56) S101
(2)
COUNTER
SAMPLE TIME(N1)
GATE
FUNCTION
OFF
COUNT
E/UT XN
TEST N1
RATIO OR PERIOD
TEST N2
ATTEN A
AC 100
DC 100
10
1
SLOPE
+
-
6 REQD (57) S201
(54) S105 (61)
INPUT SELECTOR
A REV
A-B
A+B
A FWD
C SENSE
TRIGGER VOLTAGE
ATTEN B
4 REQD (96)
DISPLAY TIME(N2)
10
10²
10³
10⁴
10⁵
10⁶
INF
CLOCK FREQUENCY DIVIDER
1
10
10²
10³
10⁴
10⁵
(60) (62) (63)
(56) S102
SENSE SELECTOR
FWD
BIN
TER
TRIGGER VOLTAGE
ATTEN D
TRIGGER VOLTAGE
(50) S202 (61)
DISPLAY RESET
ZERO
N2
RESET
POWER
ON
OVEN
CLOCK SELECTOR
INT
C INPUT
(100)
(51) S205 (61)
VIEW B-B
(52) S203
(53) S108
(52) S1
(47) I104 (45) XI104 (83) R161
(55) S206
(54) S106 (61)
(60) (62) (63)
(56) S103

Ⓝ REPLACES REV(M) WITH CHANGE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 11 Nov 64
CHECKED [illegible] 3-8-65
APPROVAL K E [illegible] 3-8-65
APPROVAL [illegible] 3/21/65
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO 99974
SIZE E
1900032
SCALE FULL
SHEET 4 OF 4

1900032 P

REQUIREMENTS:

1. ELECTRICAL SPECIFICATIONS:

A. "INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:
- (1) "A FWD": INPUT (2 MC MAX) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.
- (2) "A REV": "A" INPUT (100 KC MAX) IS COUPLED TO THE "FUNCTION SWITCH. COUNTING IS FORWARD ONLY BUT THE "-" POLARITY LAMP IS LIT.
- (3) "A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 50µS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.
- (4) "A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 20µS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 20 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.
- (5) "C-SENSE": THE INTERNAL (100 KC) CLOCK IS FED THRU THE "CLOCK FREQUENCY DIVIDER" TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.

B. "FUNCTION", ROTARY SWITCH WITH THE FOLLOWING POSITIONS:
- (1) "RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 µS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES OF THE INTERNAL (100 KC) CLOCK, AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C - SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION. IN THE "PERIOD" FUNCTION THE COUNT GATE REMAINS OPEN FOR A LENGTH OF TIME DETERMINED BY "N" "D" PULSES, AND DURING THE GATE OPEN TIME THE CLOCK PULSES FROM THE "CLOCK FREQUENCY DIVIDER", VIA "C - SENSE" POSITION OF THE "INPUT SELECTOR", ARE COUNTED.
- (2) "EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT - GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE "CLOCK FREQUENCY DIVIDER." THE COUNT - ACCUMULATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE INTERNAL (100 KC) CLOCK AFTER WHICH THE INSTRUMENT AUTOMATICALLY RESETS AND RECYCLES.
- (3) "TEST N_1": THE INTERNAL (100 KC) CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE "CLOCK FREQUENCY DIVIDER." THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.
- (4) OFF: SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE WHICH IS HELD PERMANENTLY CLOSED AND NO COUNTS ARE ACCUMULATED.
- (5) "TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 PULSES FROM THE "CLOCK FREQUENCY DIVIDER".
- (6) "COUNT": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED COUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET BUTTON ONLY.

C. "SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999"

D. "DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS: - "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" AND "INF". (INFINITE DISPLAY TIME WITH MANUAL RESET).

E. "DISPLAY RESET": EXCEPT IN THE "TEST", "OFF", AND "COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE INTERNAL CLOCK (100 KC). AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS (EXCEPT IN THE "INF" POSITION) AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT PANEL ROTARY SWITCH.
- (1) "ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.
- (2) "N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.
- (3) * ON 10^6 POSITION COUNTER RESETS TO ZERO.

F. "SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.
- (1) "FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" AND "B" INPUT CONDITIONS.
- (2) "BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12V).
- (3) "TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" AND "B" INPUT CHANNELS, AS FOLLOWS:
  - a. IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.
  - b. WHEN "A" CHANNEL OUTPUT IS "1" AND "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.
  - c. WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE REVERSE.
- (4) "CLOCK FREQUENCY DIVIDER": A 6-POSITION ROTARY SWITCH WHICH DIVIDES THE INTERNAL (100 KC) CLOCK AND THE "C" INPUT BY ONE OF THE FOLLOWING FACTORS "1", "10", "10^2", "10^3", "10^4", "10^5".
- (5) INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.
  - a. "ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).
  - b. "TRIGGER-VOLTAGE" "+" "-": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.
  - c. "SLOPE" CONTROL "+" AND "-": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.
- (6) "RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.
- (7) "POWER-ON": TOGGLE SWITCH.
- (8) "CLOCK SELECTOR": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.
- (9) "A" INPUT"
  - a. COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.
  - b. SENSITIVITY: 100 MV RMS.
  - c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.
- (10) "B" INPUT"
  - a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.
  - b. SENSITIVITY: 100 MV RMS.
  - c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.
- (11) "C" INPUT:
  - a. INPUT RATE: 10 CPS TO 100 KC.
  - b. INPUT RANGE: 1 VOLT TO 28 VOLTS RMS
  - c. SENSITIVITY: 1 VOLT RMS.
  - d. IMPEDANCE: 1.00 KΩ MIN.
- (12) "D" INPUT:
  - a. COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED TO 10 CPS TO 100 KC.
  - b. SENSITIVITY: 100 MV RMS
  - c. IMPEDANCE: 1 MEGOHM MIN. SHUNTED BY APPROXIMATELY 75 PF.
- (13) CONNECTOR OUTPUTS:
  - a. DIGITS: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION $-.2^{+.3}_{-.1}$ VOLTS FOR BINARY "1" AND -12.5 ± 1 VOLT FOR BINARY "0" OUTPUT IMPEDANCE 100 KΩ ± 10%. OUTPUT CURRENT 50 MICRO AMPS MAX.
  - b. PRINT COMMAND: A DC CHANGE FROM BINARY "1" TO BINARY "0" SHALL BE AVAILABLE WHEN THE COUNT GATE CLOSES .35 KΩ OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA.
  - c. POLARITY COMMAND: A BINARY "0" SHALL REPRESENT A "+" POLARITY AND A BINARY "1" SHALL REPRESENT A "-" POLARITY. -12.5 ± 1 VOLT FOR BINARY "0". $-.2^{+.3}_{-.1}$ VOLT FOR BINARY "1". OUTPUT IMPEDANCE 1 KΩ ± 5% OUTPUT CURRENT 1 MA MAX.
  - d. COLOR COMMAND: A BINARY "0" SHALL BE AVAILABLE TO PRODUCE A BLACK PRINT-OUT ON THE PRINTED.
  - e. IN "RATIO OR PERIOD", "E/UT X N_1", "TEST N_1" AND "TEST N_2" THE COUNTER SHALL BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2MA MAX.
  - f. REMOTE RESET: A REMOTE RESET SHALL BE BROUGHT OUT IN PARALLEL WITH THE FRONT PANEL RESET.
- (14) "N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.
- (15) "N_2" TIME BASE OUTPUT : BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12.5 ± 2.5 V POS. PULSE 5 (±1) µS WIDE WITH 0.5 µS RISE. OUTPUT IMPEDANCE 1 KΩ REFERENCED TO -15V.
- (16) INDICATORS:
  - a. 6 COLUMNS: DIGITS "0" THRU "9" FOR EACH COLUMN. DISPLAY INDICATES ACCUMULATED COUNT.
  - b. "+" AND "-" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.
  - c. "GATE INDICATOR": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.
- (17) POWER REQUIREMENTS: 115 AC LINE ± 10%, 60 ± 5 CPS, APPROXIMATELY 100 WATTS.
- (18) CLOCK STABILITY: THE INTERNAL CLOCK (100 KC ± 1 CPS) SHALL HAVE A STABILITY OF 2 PARTS IN 10^7 PER DAY AND 5 PARTS IN 10^7 PER WEEK.
- (19) OCS TEST: THE INTERNAL CLOCK (100 KC) SHALL BE BROUGHT OUT TO J5 OCS TEST JACK.

G. THE SCHEMATIC DIAGRAM, ELEC. IS FOR REFERENCE ONLY.

2. MECHANICAL SPECIFICATIONS:

A. TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

B. THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900032.

C. THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE PER ND 1002019. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

D. SURFACES A&B SHALL BE PARALLED WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF FRONT PANEL WITHIN .062. DIMENSION "A" SHALL BE EQUAL TO DIMENSION "B" WITHIN .040.

E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

F. WEIGHT: NOT TO EXCEED 50 LBS.

G. BORDER AREA, WITHIN .578/.547 INCH OF PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

H. THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.

J. SIGNAL INPUTS, CHASSIS AND POWER LOW SHALL BE ELECTRICALLY ISOLATED FROM EACH OTHER.

K. DATA SOURCE:
BECKMAN INSTRUMENTS INC., BERKELEY DIV.
RICHMOND, CALIFORNIA
REVERSING EPUT METER MODEL 3350/6-6.

L. THE COUNTER SHALL BE ELECTRICALLY COMPATIBLE FOR SIMULTANEOUS USE WITH THE "INDICATOR, COUNTER, REMOTE" PART NUMBER 1900020 AND "PRINTER" PART NUMBER 1900063.

M. ALLOW .500 ± .016 CLEARANCE BEHIND EACH HOLE.

N. CONNECTOR INFORMATION

J5
OSC TEST
BNC UG-1094/U

J4 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL
A	CHASSIS GND
D	INPUT POWER HI
E	INPUT POWER LO

SPARES B, C, F, G, H

J3 SIGNAL INPUT

PIN NO.	SIGNAL	PIN NO.	SIGNAL
A	A INPUT	F	N_1 OUTPUT
B	B INPUT	G	N_2 OUTPUT
C	C INPUT	H	SIGNAL LOW
D	D INPUT	J	SPARE
E	-15V LOW	K	SPARE

N. CONNECTOR INFORMATION (CONTINUED)

J1 SIGNAL OUTPUT
MS3112E22-55S

PIN NO.	SIGNAL		PIN NO.	SIGNAL	
B	1	DIGIT 1 OR LSD	k	REMOTE RESET	
C	2		m	PRINT-OUT COLOR CONTROL	
D	4		n	SPARE	
E	8		$\bar{p}$	SIGN INDICATOR "0"=(+) "1"=(-)	
A	SPARE		r	PRINT COMMAND, CR READOUT CONTROL	
F	SPARE				
G	SPARE		$\bar{s}$	INHIBIT RESET (AN INPUT SIGNAL)	
H	1	DIGIT 2	t	SIGNAL GROUND	
J	2		u	DISPLAY OVER RIDE	
K	4		$\bar{v}$	COMMON, SELECTOR SWITCH	
L	8		$\bar{w}$	A FWD	SIGNALS FROM THE SELECTOR SWITCH
M	SPARE		$\bar{x}$	A REV	
N	SPARE		$\bar{y}$	A - B	
P	1	DIGIT 3	$\bar{z}$	A + B	
R	2		AA	C SENSE	
S	4		BB	COMMON, FUNCTION SWITCH	
T	8		EE	OFF	SIGNALS FROM THE FUNCTION SWITCH
U	SPARE		FF	COUNT	
V	SPARE		CC	RATIO OR PERIOD	
W	1	DIGIT 4	DD	EPUT X N_1	
X	2		GG	TEST N_1	
Y	4		HH	TEST N_2	
Z	8				
a	SPARE				
b	1	DIGIT 5			
$\bar{c}$	2				
d	4				
e	8				
f	SPARE				
g	1	DIGIT 6 MSD			
h	2				
i	4				
j	8				

J2 SIGNAL OUTPUT
MS3112E-22-55 SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS k, m, n, $\bar{s}$, u, $\bar{v}$, $\bar{w}$, $\bar{x}$, y, $\bar{z}$, AA, BB, CC, DD, EE, FF, GG, AND, HH, ARE SPARES.

P. FOR NEW PROCUREMENT ITEM 59 SHALL BE MOUNTED IN LOCATION SHOWN ON SHEET 2 OF 4. ON INITIAL PROCUREMENT ITEM 59 WAS LOCATED AS SHOWN ON SHEET 3 OF 4.

Q. ITEMS 111 THRU 120 ARE SUPPLIED AS A PART OF VENDORS COUNTER S/N 163 AND ON. ITEMS 18, 19 AND 25 ARE DELETED FROM VENDORS COUNTER S/N 163 AND ON.

REVISIONS TDRR 00998

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	DKD
P		REVISED PER TDRR 22676		1 OCT 65	JWP
R		REVISED PER TDRR 25578		3 FEB [illegible]	Rwh

Ⓝ REPLACES REV(M) WITH CHANGE

QUANTITY REQUIRED	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 2.Q	2		120	1901751 -98	DIODE
	1		119	-157	DRIVER P.C. ASSEMBLY
	1		118	-156	BUFFER P.C. ASSEMBLY
	1		117	-155	CONTROL P.C. ASSEMBLY — SEE NOTE 2P
	1		116	-154	CAPACITOR FIXED
	2		115	-153	RESISTOR
	1		114	-152	
	1		113	-151	
	1		112	-150	
	1		111	1901751 -149	RESISTOR FIXED
SEE NOTE 1G.	X		110	1901731	SCHEMATIC DIAGRAM, ELEC
	2		109	1901751-126	WASHER LOCK
	4		108	1901751-122	SCREW FLAT HD
	1		107	1901751-113	RESISTOR FIXED
	2		106	1901751-100	DIODE
	1		105	1901751-096	CAPACITOR FIXED
	131		104	1901751-128	NUT HEX
	25		103	1901751-125	WASHER LOCK
	8		102	1901751-124	WASHER LOCK
	137		101	1901751-123	WASHER LOCK
	8		100	1901751-120	SCREW PAN HD
	25		99	1901751-119	SCREW PAN HD
	4		98	1901751-118	SCREW PAN HD
	4		97	1901751-117	SCREW PAN HD
	22		96	1901751-116	SCREW PAN HD
	125		95	1901751-115	SCREW PAN HD
	2		94	1901751-135	TERMINAL STRIP
	2		93	1901751-134	TERMINAL STRIP
	6		92	1901751-071	STANDOFF
	1		91	1901751-136	TRANSISTOR
	4		90	1901751-099	DIODE
	1		89	1901751-098	DIODE
	30		88	1901751-097	DIODE
	1		87	1901751-091	CAPACITOR FIXED
	1		86	1901751-090	CAPACITOR FIXED
	3		85	1901751-089	CAPACITOR FIXED
	1		84	1901751-088	CAPACITOR FIXED
	1		83	1901751-110	RESISTOR FIXED
	1		82	1901751-109	RESISTOR FIXED
	1		81	1901751-108	RESISTOR FIXED
	2		80	1901751-107	RESISTOR FIXED
	1		79	1901751-106	RESISTOR FIXED
	20		78	1901751-105	RESISTOR FIXED
	2		77	1901751-068	SHOULDER WASHER
	1		76	1901751-067	FAN SCREEN (INSEP ASSY)
	1		75	1901751-066	FAN BLADE
	1		74	1901751-065	FAN MOTOR
	2		73	1901751-064	FUSE
	2		72	1901751-063	FUSE HOLDER
	1		71	1901751-062	CONNECTOR
	8		70	1901751-061	HYRING
	8		69	1901751-060	SOCKETS
	8		68	1901751-059	CONTACTS
	1		67	1901751-058	CONNECTOR
	1		66	MS3112E16-8P	(1901751-057) CONNECTOR
	1		65	MS3112E22-55SW	(1901751-056) CONNECTOR
	1		64	MS3112E22-55S	(1901751-055) CONNECTOR
	3		63	1901751-054	KNOB CONCENTRIC
	3		62	1901751-053	KNOB MODIFIED
	5		61	1901751-052	KNOB SKIRTED
	3		60	1901751-051	SHIELD ATTEN SW
	1		59	1901751-050	DIODE BOARD A
	1		58	1901751-049	BRACKET THUMBWHEEL SWITCH
	6		57	1901751-048	SWITCH THUMBWHEEL
	3		56	1901751-047	SWITCH TOGGLE
	1		55	1901751-046	SWITCH TOGGLE
	2		54	1901751-045	SWITCH ROTARY
	1		53	1901751-044	SWITCH PUSH BUTTON
	2		52	1901751-043	SWITCH TOGGLE
	1		51	1901751-042	SWITCH ROTARY
	1		50	1901751-041	SWITCH ROTARY
	1		49	1901751-040	SWITCH ROTARY
	3		48	1901751-039	ATTENUATOR SWITCH ASSY
	4		47	1901751-038	LAMP 6V INCAND.
	1		46	1901751-037	LAMP HOLDER (GRN)
	1		45	1901751-036	LAMP HOLDER (RED)
	1		44	1901751-035	LAMP HOLDER (-)
	1		43	1901751-034	LAMP HOLDER (+)
	1		42	1901751-033	SOCKET OCTAL
	64		41	1901751-032	BRACKET P.C. BOARD
	9		40	1901751-031	CONDUCTOR P.C. BOARD 18 PIN
	29		39	1901751-030	CONNECTOR P.C. BOARD 15 PIN
	1		38	1901751-029	RELAY BOARD ASSY
	1		37	1901751-028	OUTPUT DIODE BOARD ASSY
	1		36	1901751-027	LOGIC EYELET BOARD ASSY
	1		35	1901751-026	RESET DIODE BOARD ASSY
	1		34	1901751-025	SHIELD BOTTOM B
	2		33	1901751-024	SHIELD BOTTOM A
	3		32	1901751-023	SHIELD TOP
	1		31	1901751-022	P.C. EXTENSION 15 PIN
	1		30	1901751-021	P.C. EXTENSION 18 PIN
	1		29	1901751-020	BRACKET EXTENSION BOARD
	1		28	1901751-019	BRACKET EXTENSION BOARD
	1		27	1901751-018	RELAY HGP
	1		26	1901751-015	RESET P.C. ASSY
SEE NOTE 2.Q	~~1~~		~~25~~	~~1901751-014~~	~~DRIVER P.C. ASSY~~
	1		24	1901751-013	POLARITY DETECTION NO.2 P.C. ASSY
	1		23	1901751-012	POLARITY DETECTION NO.1 P.C. ASSY
	1		22	1901751-011	TIME BASE P.C. ASSY
	1		21	1901751-010	SENSE P.C. ASSY
	1		20	1901751-009	INPUT P.C. ASSY
SEE NOTE 2.Q	~~1~~		~~19~~	~~1901751-008~~	~~CONTROL P.C. ASSY~~
SEE NOTE 2.Q	~~1~~		~~18~~	~~1901751-007~~	~~BUFFER P.C. ASSY~~
	1		17	1901751-006	AUXILIARY P.C. ASSY
	3		16	1901751-005	AMPLIFIER P.C. ASSY
	2		15	1901751-004	760 A DCU P.C. ASSY
	6		14	1901751-003	752 B DCU P.C. ASSY
	6		13	1901751-002	751 A DCI P.C. ASSY
	11		12	1901751-001	750 A DCU P.C. ASSY
	1		11	1901741-011	1 MC OSCILLATOR ASSY
	1		10	1901747-011	POWER SUPPLY ASSY
	1		9	1901735	COVER BOTTOM
	1		8	1901734	COVER TOP
	1		7	1901737	BRACKET RIGHT
	1		6	1901736	BRACKET LEFT
	1		5	1901739	SIDE GUSSET LEFT
	1		4	1901738	SIDE GUSSET RIGHT
	1		3	1901733	PANEL REAR
	1		2	1901732	FRONT PANEL
	1		1	1901750	CHASSIS (INSEP ASSY)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011	1901976-011	-011
1900041-011	1900004-021	-011
1900041-011	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

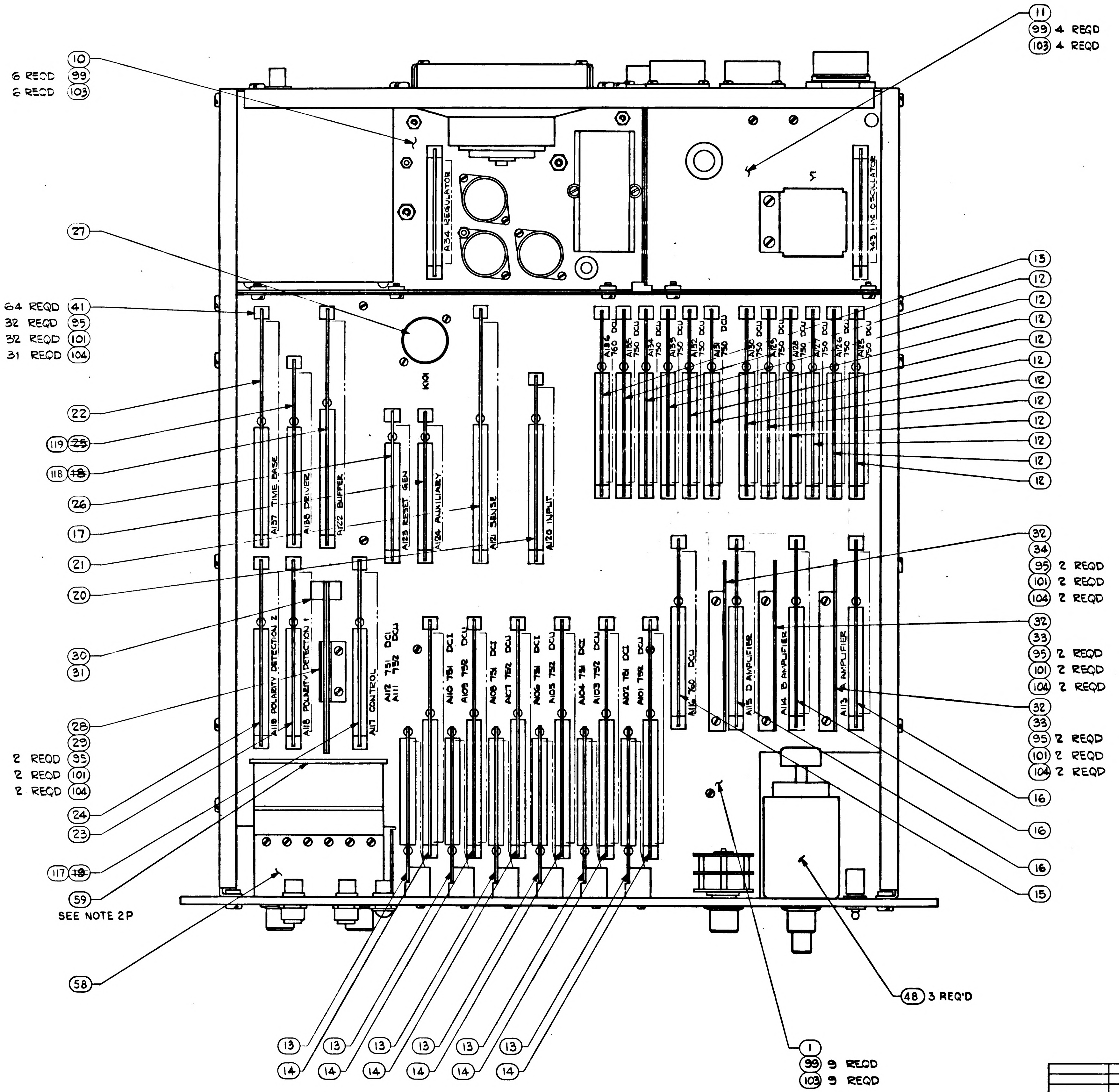
AC ELECTRONICS DIVISION
GENERAL MOTORS CORP MILWAUKEE WIS.
DRAWN [illegible] DATE 11 Nov 64
CHECKED [illegible] 22 MAR 65
APPROVAL K E Gunse 22 MAR 65
APPROVAL [illegible] 6/21/65
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO. 99974
SIZE E
1900032
SCALE FULL
SHEET 1 OF 4

REVISIONS			TDRR OC 998		
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REV M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	DKD
P		REVISION STATUS CHANGED		1 OCT 65	
R		REVISED PER TDRR 25578		5 FEB 66	RWH



(10)
6 REQD (99)
6 REQD (103)
(11)
(99) 4 REQD
(103) 4 REQD
(27)
A34 REGULATOR
A43 LINE OSCILLATOR
64 REQD (41)
32 REQD (95)
32 REQD (101)
31 REQD (104)
K101
A136 760 DCU
A135 750 DCU
A134 750 DCU
A133 750 DCU
A132 750 DCU
A131 750 DCU
A130 750 DCU
A129 750 DCU
A128 750 DCU
A127 750 DCU
A126 750 DCU
A125 750 DCU
(15)
(12)
(12)
(12)
(12)
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(12)
(12)
(12)
(12)
(22)
(119) (25)
(118) (18)
(26)
(17)
(21)
(20)
A137 TIME BASE
A138 DRIVER
A122 BUFFER
A123 RESET GEN
A124 AUXILIARY
A121 SENSE
A120 INPUT
(30)
(31)
(28)
(29)
2 REQD (95)
2 REQD (101)
2 REQD (104)
(24)
(23)
(117) (19)
(59)
SEE NOTE 2P
(58)
A119 POLARITY DETECTION 2
A118 POLARITY DETECTION 1
A117 CONTROL
A112 751 DCI
A111 752 DCU
A110 751 DCI
A109 752 DCU
A108 751 DCI
A107 752 DCU
A106 751 DCI
A105 752 DCU
A104 751 DCI
A103 752 DCU
A102 751 DCI
A101 752 DCU
A116 760 DCU
A115 D AMPLIFIER
A114 B AMPLIFIER
A113 A AMPLIFIER
(32)
(34)
(95) 2 REQD
(101) 2 REQD
(104) 2 REQD
(32)
(33)
(95) 2 REQD
(101) 2 REQD
(104) 2 REQD
(32)
(33)
(95) 2 REQD
(101) 2 REQD
(104) 2 REQD
(16)
(16)
(16)
(15)
(48) 3 REQ'D
(13) (13) (13) (13) (13) (13)
(14) (14) (14) (14) (14) (14)
(1)
(99) 9 REQD
(103) 9 REQD

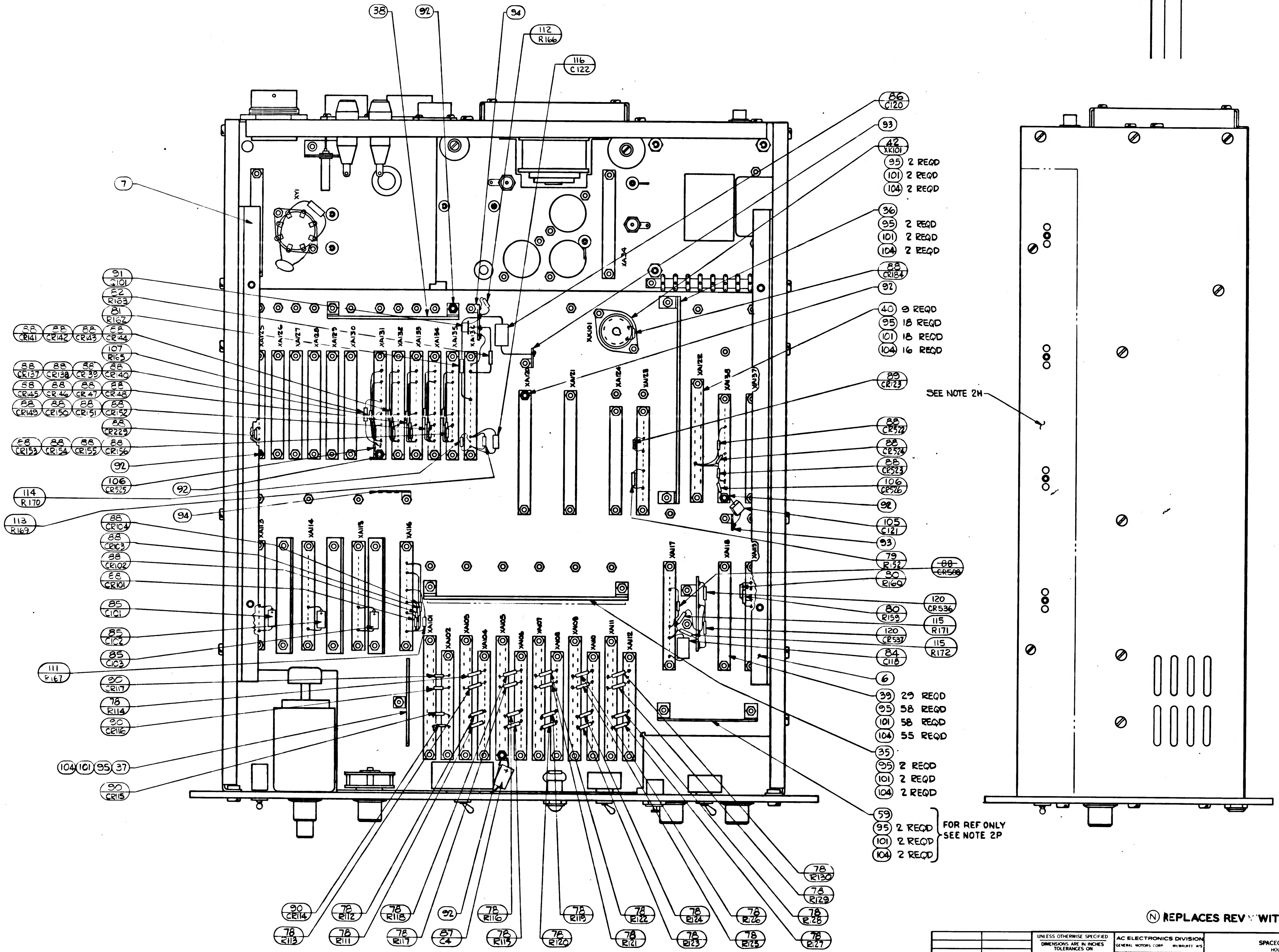
Ⓝ REPLACES REV (M) WITH CHANGE

NEXT ASSY / USED ON / APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − DECIMALS + − ANGLES + − DO NOT SCALE THIS DRAWING	AC ELECTRONICS DIVISION GENERAL MOTORS CORP MILWAUKEE WIS	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	MATERIAL —	DRAWN Jaeger DATE 11 Nov 64 CHECKED 3-8-65 APPROVAL K Ejuss 3-8-65 APPROVAL NASA APPROVAL MIT APPROVAL	COUNTER	
	CONTRACT NAS-9-497		CODE IDENT NO 99974	SIZE E · 1900032
			SCALE FULL	SHEET 2 OF 4

REVISIONS

TDRR C0778E

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	JUNE 65	
P		REVISION STATUS CHANGED		1 OCT 65	
R		REVISED PER TDRR 25578		3 FEB	



38
92
94
112 R166
116 C122
86 C120
93
42 XK101
95 2 REQD
101 2 REQD
104 2 REQD
36
95 2 REQD
101 2 REQD
104 2 REQD
88 CR184
92
40 9 REQD
95 18 REQD
101 18 REQD
104 16 REQD
89 CR123
88 CR522
88 CR524
88 CR523
106 CR526
92
105 C121
93
79 R152
88 CR508
80 R160
120 CR536
80 R159
115 R171
120 CR537
115 R172
84 C118
6
39 29 REQD
95 58 REQD
101 58 REQD
104 55 REQD
35
95 2 REQD
101 2 REQD
104 2 REQD
59
95 2 REQD
101 2 REQD
104 2 REQD
FOR REF ONLY SEE NOTE 2P
7
91 C101
82 R163
81 R162
88 CR141
88 CR142
88 CR143
88 CR144
107 R165
88 CR137
88 CR138
88 CR139
88 CR140
88 CR145
88 CR146
88 CR147
88 CR148
88 CR149
88 CR150
88 CR151
88 CR152
88 CR229
88 CR153
88 CR154
88 CR155
88 CR156
92
106 CR525
92
114 R170
94
113 R169
88 CR104
88 CR103
88 CR102
88 CR101
85 C101
85 C102
85 C103
111 R167
90 CR117
78 R114
90 CR116
104 101 95 37
90 CR115
90 CR114
78 R113
78 R112
78 R111
78 R118
78 R117
92
87 C4
78 R116
78 R115
78 R120
78 R119
78 R161
78 R122
78 R123
78 R124
78 R125
78 R126
78 R127
78 R128
78 R129
78 R130
XY1
XA134
XK101
XA125
XA126
XA127
XA128
XA129
XA130
XA131
XA132
XA133
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XA121
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XA123
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XA137
XA115
XA116
XA115
XA116
XA101
XA102
XA103
XA104
XA105
XA106
XA107
XA108
XA110
XA111
XA112
XA117
XA118
XA119
SEE NOTE 2H

Ⓝ REPLACES REV M WITH CHANGE

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ \+ \+
− − −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

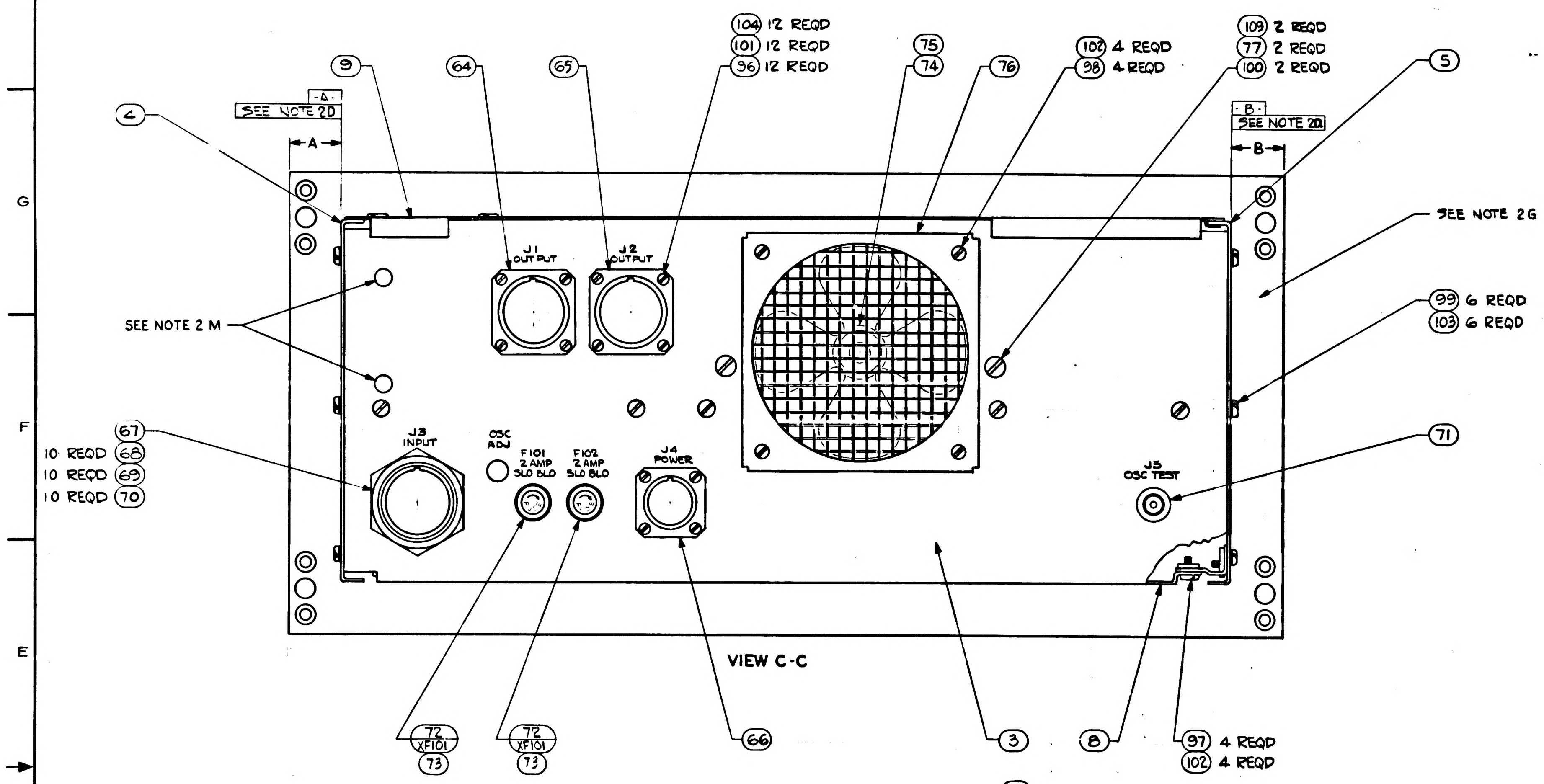
AC ELECTRONICS DIVISION
GENERAL MOTORS CORP MILWAUKEE WIS
DRAWN DATE 11 Nov 64
CHECKED 3-8-65
APPROVAL K E Juss 3-8-65
APPROVAL 9/2/65
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

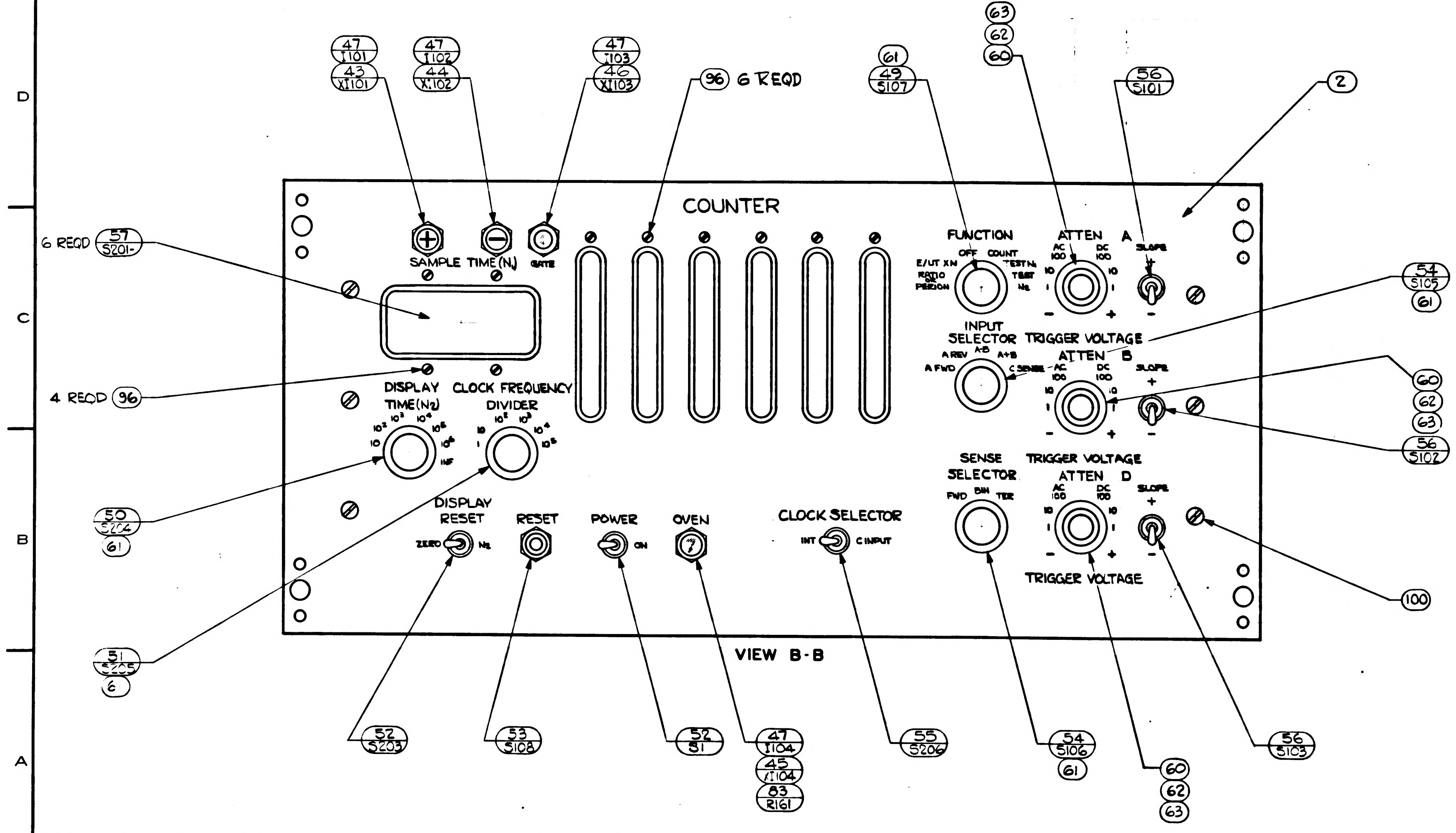
CODE IDENT NO 99974
SIZE E
1900032
SCALE FULL
SHEET 3 OF 4

REVISIONS					TDRR 20795
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REVISION M WITH CHANGE PER TDRR 20387	—	2 JUNE 65	DKD
P		REVISION STATUS CHANGED		1 OCT 65	JW P
R		REVISION STATUS CHANGED		3 FEB 66	RWH



SEE NOTE 2D
-A-
A
SEE NOTE 2D
-B-
B
4
9
64
65
104 12 REQD
101 12 REQD
96 12 REQD
75
74
76
102 4 REQD
98 4 REQD
109 2 REQD
77 2 REQD
100 2 REQD
5
SEE NOTE 2G
99 6 REQD
103 6 REQD
SEE NOTE 2 M
J1 OUTPUT
J2 OUTPUT
67
10 REQD 68
10 REQD 69
10 REQD 70
J3 INPUT
OSC ADJ
F101 2 AMP SLO BLO
F102 2 AMP SLO BLO
J4 POWER
J5 OSC TEST
71
72 XF101 73
72 XF101 73
66
3
8
97 4 REQD
102 4 REQD

VIEW C-C



47 I101 43 XI101
47 I102 44 XI102
47 I103 46 XI103
96 6 REQD
61 49 S107
63 62 60
56 S101
2
COUNTER
6 REQD 57 S201-
SAMPLE TIME (N1)
GATE
FUNCTION
OFF COUNT
E/UT XN
RATIO OR PERIOD
TEST N1
TEST N2
ATTEN A
AC 100
DC 100
10
1
SLOPE
54 S105 61
INPUT SELECTOR
A REV A-B A+B
A FWD C SENSE
TRIGGER VOLTAGE
ATTEN B
60 62 63
56 S102
4 REQD 96
DISPLAY TIME (N2)
10 10² 10³ 10⁴ 10⁵ 10⁶ INF
CLOCK FREQUENCY DIVIDER
1 10 10² 10³ 10⁴ 10⁵
SENSE SELECTOR
FWD BIN TER
TRIGGER VOLTAGE
ATTEN D
50 S204 61
DISPLAY RESET
ZERO N2
RESET
POWER
ON
OVEN
CLOCK SELECTOR
INT C INPUT
100
51 S205 61
52 S203
53 S108
52 S1
47 I104
45 XI104
83 R161
55 S206
54 S106 61
60 62 63
56 S103

VIEW B-B

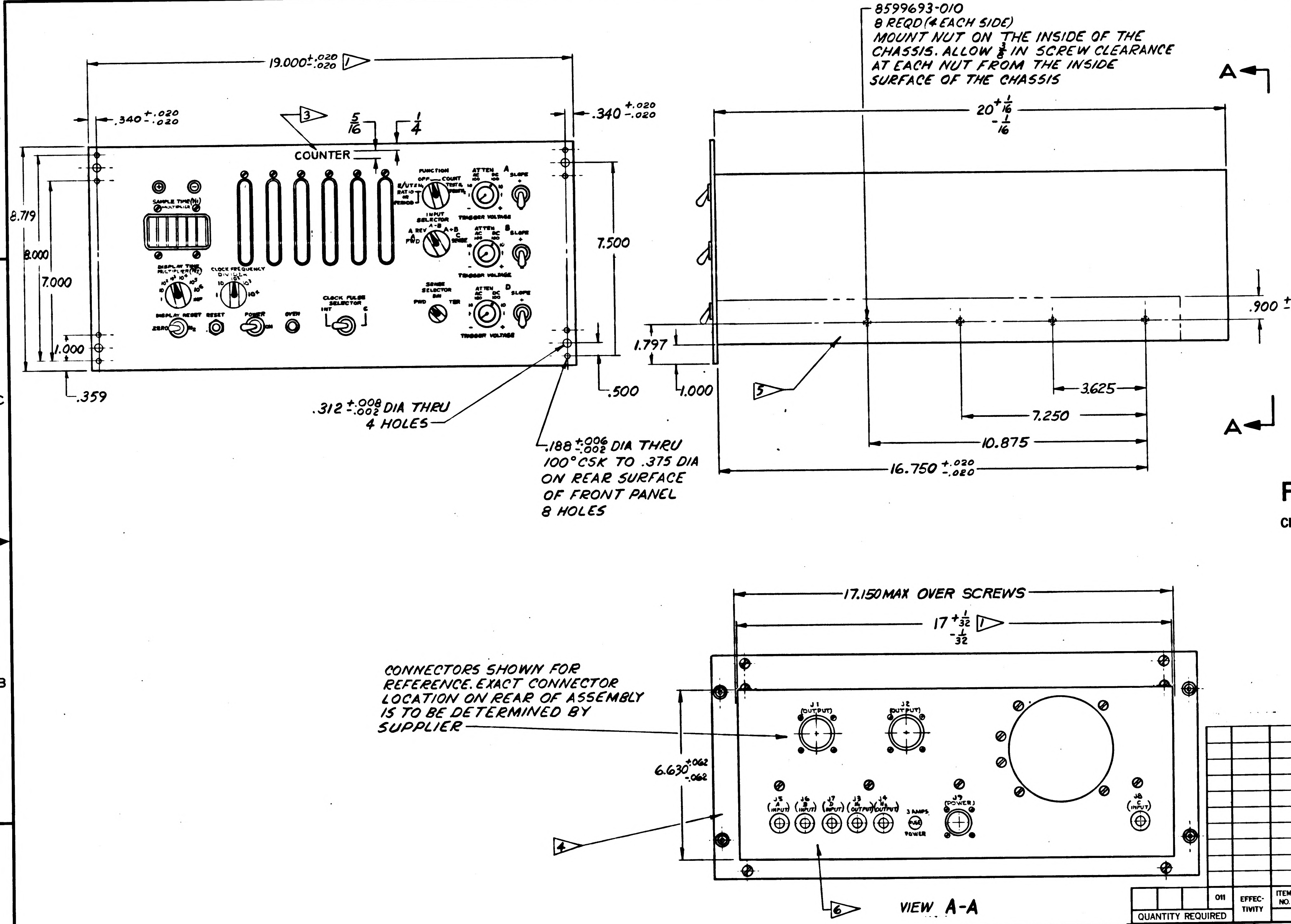
Ⓝ REPLACES REV Ⓜ WITH CHANGE

NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — ± — ± — DO NOT SCALE THIS DRAWING	AC ELECTRONICS DIVISION GENERAL MOTORS CORP MILWAUKEE WIS DRAWN 11 Nov 64 CHECKED 3-8-65 APPROVAL K E 3-8-65 APPROVAL 6/21/65	MANNED SPACECRAFT CENTER HOUSTON, TEXAS COUNTER
APPLICATION		MATERIAL —	NASA APPROVAL	CODE IDENT NO 99974 · SIZE E · 1900032
		CONTRACT NAS-9-497	MIT APPROVAL	SCALE FULL · SHEET 4 OF 4

1900032 R

D 1900032

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		REV.SED & REDRAWN		25 JAN 63	
D		REVISED	DO 51352	4 MAR 63	


19.000 +.020 -.020 1
.340 +.020 -.020
.340 +.020 -.020
3
5/16
1/4
COUNTER
SAMPLE TIME (N1) MULTIPLIER
DISPLAY TIME MULTIPLIER (N2)
1
10
10^2
10^3
10^4
10^5
10^6
INF
CLOCK FREQUENCY DIVIDER
1
10
10^2
10^3
10^4
DISPLAY RESET
ZERO
N_2
RESET
POWER
ON
OVEN
CLOCK PULSE SELECTOR
INT
C
FUNCTION
OFF
COUNT
E/UTEN
RATIO OR PERIOD
TEST
INPUT SELECTOR
A REV
A FWD
A-B
A+B
C SENSE
SENSE SELECTOR BIN
FWD
TER
ATTEN
AC 100
DC 100
A
B
D
SLOPE
TRIGGER VOLTAGE
8.719
8.000
7.000
1.000
.359
7.500
.500
1.797
1.000
.312 +.008 -.002 DIA THRU 4 HOLES
20 +1/16 -1/16
.900 +.020 -.020
5
3.625
7.250
10.875
16.750 +.020 -.020
A
A
17.150 MAX OVER SCREWS
17 +1/32 -1/32 1
6.630 +.062 -.062
J1 (OUTPUT)
J2 (OUTPUT)
J5 A (INPUT)
J6 B (INPUT)
J7 D (INPUT)
J3 N1 (OUTPUT)
J4 N2 (OUTPUT)
3 AMPS FUSE POWER
J9 (POWER)
J8 C (INPUT)
4
6

.188 +.006 -.002 DIA THRU
100° CSK TO .375 DIA
ON REAR SURFACE
OF FRONT PANEL
8 HOLES

8599693-010
8 REQD (4 EACH SIDE)
MOUNT NUT ON THE INSIDE OF THE
CHASSIS. ALLOW 3/8 IN SCREW CLEARANCE
AT EACH NUT FROM THE INSIDE
SURFACE OF THE CHASSIS

CONNECTORS SHOWN FOR
REFERENCE. EXACT CONNECTOR
LOCATION ON REAR OF ASSEMBLY
IS TO BE DETERMINED BY
SUPPLIER

VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 **DATE** 24 Apr. 63

						ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
							TO BE ASSIGNED	EPUT METER (MODEL NO. 3350/6)
			011	EFFECTIVITY				
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900041-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Ramde 24 JAN 63
APPROVAL W. Munson 25 JAN 63
APPROVAL 25 JAN 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.	SIZE	
	D	1900032
SCALE —		SHEET 1 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD

REQUIREMENTS:

ELECTRICAL SPECIFICATIONS:

"INPUT SELECTOR" ROTARY SWITCH WITH THE FOLLOWING FIVE POSITIONS:

"A FWD": INPUT (2 MC MAX.) COUPLED TO "FUNCTION" SWITCH. THE COUNT CHAIN IS SET TO COUNT IN THE FORWARD DIRECTION ONLY.

"A REV": "A" INPUT (100 KC MAX.) IS COUPLED TO THE "FUNCTION" SWITCH. COUNTING IS FORWARD ONLY BUT THE "−" POLARITY LAMP IS LIT.

"A-B": THE "A" AND "B" INPUTS ARE COUPLED TO THE "FUNCTION" SWITCH VIA "DUAL-INPUT" CIRCUITRY WHICH SETS THE COUNT DIRECTION CONTROL IN FORWARD FOR "A" INPUTS OR IN REVERSE FOR "B" INPUTS. THERE MUST BE AT LEAST 35 μS SEPARATION BETWEEN SUCCESSIVE PULSES RECEIVED ON DIFFERENT CHANNELS. THERE MUST BE 10 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL.

"A+B": THE "A" AND "B" CHANNELS ARE CONNECTED TO THE "FUNCTION" SWITCH. THERE MUST BE A SEPARATION OF AT LEAST 10 μS BETWEEN SUCCESSIVE PULSES ON DIFFERENT CHANNELS, OR THERE MUST BE 10 MICROSECONDS SEPARATION BETWEEN SUCCESSIVE PULSES ON THE SAME CHANNEL. THE COUNT CHAIN IS SET FOR FORWARD COUNTING ONLY.

"C-SENSE": THE "C" INPUT (100 KC MAX.) IS COUPLED TO THE "FUNCTION" SWITCH. THE COUNTING CONDITIONS ARE DETERMINED BY THE SETTING OF THE "SENSE SELECTOR" SWITCH.

"FUNCTION", ROTARY SWITCH WITH THE FOLLOWING POSITIONS:

"RATIO OR PERIOD": SIGNALS FROM "INPUT SELECTOR" ARE FED TO THE COUNT-GATE. THE COUNT GATE IS OPENED BY THE FIRST PULSE TO ARRIVE FROM THE "D" INPUT AFTER THE INSTRUMENT RESETS. (THIS MUST NOT OCCUR FOR AT LEAST 5 μS AFTER RESET). THE COUNT GATE REMAINS OPEN FOR A PERIOD DETERMINED BY N_1 "D" PULSES. THE ACCUMULATED COUNT IS THEN DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE "C" INPUT, AFTER WHICH THE INSTRUMENT RESETS AUTOMATICALLY. USING THIS FUNCTION, THE "C-SENSE" POSITION OF THE "INPUT SELECTOR", AND THE "FWD" POSITION OF THE "SENSE SELECTOR", THE INSTRUMENT OPERATES AS IN A "PERIOD" FUNCTION.

"EPUT X N_1": SIGNALS FROM THE "INPUT SELECTOR" ARE FED TO THE COUNT-GATE, WHICH IS OPENED FOR A PERIOD OF TIME DETERMINED BY N_1 PULSES FROM THE "C" INPUT. THE COUNT-ACCUMULATED IS DISPLAYED FOR A PERIOD DETERMINED BY N_2 PULSES FROM THE "C"-INPUT AFTER WHICH THE INSTRUMENT AUTOMATICALLY RESETS AND RECYCLES.

"TEST N_1": THE INTERNAL CLOCK PULSE IS FED TO THE COUNT GATE, WHOSE OPEN PERIOD IS DETERMINED BY N_1 PULSES FROM THE INTERNAL CLOCK. THE COUNT IS DISPLAYED FOR APPROXIMATELY 0.75 SECS., AFTER WHICH THE INSTRUMENT RESETS AND RECYCLES.

REQUIREMENTS (CONTINUED):

"TEST N_2": AS "TEST N_1" EXCEPT THAT THE COUNT-GATE OPEN PERIOD IS N_2 CLOCK PULSE PERIODS.

"OFF"
"COUNT" } : SIGNALS FROM THE INPUT SELECTOR ARE FED TO THE COUNT GATE. THE COUNT GATE IS OPENED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "COUNT" AND CLOSED WHEN THE FUNCTION SELECTOR IS SWITCHED TO "OFF". DISPLAY OF ACCUMULATED COUNT IS CONTINUOUS. RESET IS CONTROLLED BY MANUAL RESET BUTTON ONLY.

"SAMPLE TIME N_1": A 6-DIGIT THUMBWHEEL SWITCH-SET CAPABLE OF SELECTING ANY NUMBER OF INCREMENTS FROM 1 TO "999999."

"DISPLAY TIME N_2": AN 8-POSITION ROTARY SWITCH WHICH MULTIPLIES THE PERIOD OF THE PULSE INPUT (C) TO THE TIME-BASE BY ONE OF THE FOLLOWING FACTORS:- "1", "10", "10^2", "10^3", "10^4", "10^5", "10^6" & "INF." (INFINITE DISPLAY TIME WITH MANUAL RESET).

"DISPLAY RESET": EXCEPT IN THE "TEST" & "OFF"-"COUNT" FUNCTIONS THE DISPLAY PERIOD IS ALWAYS DETERMINED BY N_2 PULSES FROM THE "C"-INPUT. AT THE END OF THE DISPLAY PERIOD THE INSTRUMENT AUTOMATICALLY RESETS AS DETERMINED BY THE TWO POSITION "DISPLAY-RESET" FRONT-PANEL ROTARY SWITCH.

"ZERO": COMPLETE INSTRUMENT RESETS TO ZERO.

"N_2": COUNT CHAIN RESETS TO NUMBER SET ON N_2* AND TIME BASE RESETS TO ZERO.

*ON 10^6 POSITION COUNTER RESETS TO ZERO.

"SENSE SELECTOR": THREE POSITION FRONT PANEL ROTARY SWITCH SELECTS CONTROL OF "SENSE" POSITION OF "INPUT SELECTOR" SWITCH.

"FWD": THE COUNTING DIRECTION IS FORWARD ONLY, REGARDLESS OF THE "A" & "B" INPUT CONDITIONS.

"BIN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUT FROM THE "A" INPUT CHANNEL ONLY. A BINARY "1" (THE MORE POSITIVE DC LEVEL) CAUSES FORWARD COUNTING. A BINARY "0" (MORE NEGATIVE DC LEVEL) CAUSES REVERSE COUNTING. ("1" = -1.5V; "0" = -12 V).

"TERN": THE COUNTING DIRECTION IS DETERMINED BY THE LOGIC LEVELS OF THE OUTPUTS FROM BOTH THE "A" & "B" INPUT CHANNELS, AS FOLLOWS:

IF THE TWO LEVELS ARE LOGICALLY ALIKE, THE COUNT GATE SHALL BE INHIBITED AND NO COUNTS REGISTERED.

WHEN "A" CHANNEL OUTPUT IS "1" & "B" OUTPUT IS "0", COUNTING SHALL BE FORWARD.

WHEN "A" IS "0" AND "B" IS "1", COUNTING WILL BE IN REVERSE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Apr 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Remde 29 JAN 63
APPROVAL 25 JAN 63
APPROVAL 25 JAN 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.
SIZE D
1900032
SCALE —
SHEET 2 OF 4

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900032 D

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

REQUIREMENTS (CONTINUED):

"CLOCK FREQUENCY DIVIDER CONTROL": THE INTERNAL CLOCK FREQUENCY (100 KC) SHALL BE DIVIDED AND FED TO THE COUNT GATE CONTROL CIRCUITRY (N_1). THE GATE OPEN PERIOD MAY THEN BE EXTENDED TO THE FOLLOWING TIMES: 10 SEC, 100 SEC, 1000 SEC, 10,000 SEC, & 100,000 SEC.

INPUT ADJUSTMENTS: THERE ARE THREE COMPLETE SETS OF INPUT ADJUSTMENT CONTROLS. ONE EACH FOR "A" INPUT, "B" INPUT AND "D" INPUT RESPECTIVELY.

"ATTEN" - "AC-DC": A SIX POSITION ROTARY SWITCH SELECTS THE INPUT COUPLING MODE (AC OR DC) AND ATTENUATION FACTOR (X1, X10, OR X100).

"TRIGGER-VOLTAGE" - "+" "−": A CONTROL CONCENTRICALLY MOUNTED WITH THE "ATTEN" SWITCH SELECTS THE TRIGGERING VOLTAGE LEVEL OF THE INPUT SIGNAL.

"SLOPE" CONTROL "+" & "−": TO SELECT EITHER THE POSITIVE OR NEGATIVE SLOPE OF THE INPUT SIGNAL.

"RESET": MANUAL PUSHBUTTON RESETS COMPLETE INSTRUMENT WHEN DEPRESSED.

"POWER-ON": TOGGLE SWITCH.

"C-INT": TOGGLE SWITCH TO SELECT CLOCK PULSE FROM EITHER "C" INPUT OR INTERNAL 100 KC SOURCE.

"A" INPUT:

COUNTING RATE: DC COUPLED 0-2 MC. AC COUPLED 10 CPS TO 2 MC.

SENSITIVITY: 100 MV RMS.

IMPEDANCE: 1 MEGOHM NOMINAL SHUNTED BY APPROXIMATELY 50 PF.

"B" INPUT:

COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.

SENSITIVITY: 100 MV RMS.

IMPEDANCE: 1 MEGOHM NOMINAL SHUNTED BY APPROXIMATELY 50 PF.

"C" INPUT:

INPUT RATE: 10 CPS TO 100 KC.

SENSITIVITY: 3 VOLTS RMS.

IMPEDANCE: 2.2 K OHMS NOMINAL.

REQUIREMENTS (CONTINUED):

"D" INPUT:

COUNTING RATE: DC COUPLED 0-100 KC. AC COUPLED 10 CPS TO 100 KC.

SENSITIVITY: 100 MV RMS.

IMPEDANCE: 1 MEGOHM NOMINAL SHUNTED BY APPROXIMATELY 50 PF.

READOUT OUTPUT: 6 DIGITS OF 1248 BINARY CODED DECIMAL INFORMATION, 0 VOLTS FOR BINARY "1" AND -12V FOR BINARY "0". PRINT COMMAND, A DC CHANGE FROM BINARY "1" TO BINARY "0" IS AVAILABLE WHEN COUNT GATE CLOSES. 33 K Ω OUTPUT IMPEDANCE. MAXIMUM OUTPUT CURRENT 0.1 MA. IN "TEST N_1" & "TEST N_2", THE COUNTER CAN BE PREVENTED FROM RESETTING BY MEANS OF AN INHIBIT RESET CONTACT CLOSURE TO GROUND DURING DISPLAY. EXTERNAL CONTACTS SUBJECTED TO 15 VOLTS 2 MA. MAX.

"N_1" TIME BASE OUTPUT: BRINGS OUT A SINGLE PULSE CORRESPONDING TO THE OUTPUT FROM THE "N_1" SWITCHES. THIS IS A 12V POSITIVE PULSE 5 (±1) μS WIDE WITH 0.5 μS RISE. OUTPUT IMPEDANCE 1K Ω REFERENCED TO -15V.

"N_2" TIME BASE INPUT: BRINGS OUT OUTPUT FROM "N_2" SWITCHES. THIS IS A 12 V POSITIVE PULSE 5(±1) μS WIDE WITH 0.5 μS RISE. OUTPUT IMPEDANCE 1K Ω REFERENCED TO -15V.

INDICATORS:

6 DIGITS COLUMNAR. DISPLAY INDICATES ACCUMULATED COUNT.

"+" AND "−" INDICATORS: INDICATE THE SIGN OF THE ACCUMULATED COUNT.

"GATE": FRONT PANEL LAMP WHICH LIGHTS WHEN THE COUNT GATE IS OPEN.

POWER REQUIREMENTS: 115 AC LINE ±10% 60 CPS APPROXIMATELY 100 WATTS.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. D0998 DATE 24 Apr 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+— +— +—
−— −— −—
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Rands 24 JAN 63
APPROVAL M. H. Hansen 25 JAN 63
APPROVAL A. Fridel 25 JAN 63
NASA APPROVAL 4/24/
J. P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.
SIZE D 1900032
SCALE —
SHEET 3 OF 4

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900032 D

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD

REQUIREMENTS (CONTINUED):

MECHANICAL SPECIFICATIONS:

TWO COPIES OF THE SERVICE MANUAL CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION INSTRUCTIONS SHALL BE SUPPLIED WITH EACH UNIT. ALSO ONE COPY OF THE INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.
THE EQUIPMENT SHALL PASS ALL TESTS CALLED OUT IN (ES-   )ND

ALL KNOBS SHALL BE PER MS91528 TYPE F AND K WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

THE SUPPLIER'S NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

FRONT PANEL MATERIAL: QQ-A-318, TEMPER H32, TYPE 5052 ALUMINUM $\frac{3}{16}$ THICK

[1] 19 AND 17 INCH DIMENSIONS OF PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020 AT ASSEMBLY.

FRONT PANEL FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO PANEL FRONT AND EDGES ONLY. APPLY 2 COATS OF TT-E-529A CLASS B ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED STD 595.

REAR FACE OF FRONT PANEL TO BE PROTECTED FROM CORROSION BY CONDUCTIVE FINISH PER MIL-C-5541.

[3] CHARACTERS (FUTURA-DEMIBOLD).
CHARACTER HEIGHT $\frac{1}{8}$ EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157.
CENTRALIZE AS SHOWN.

EQUIPMENT SHALL BE DESIGNED TO MEET ENVIRONMENTAL REQUIREMENTS PER (ES   )ND-
WEIGHT: NOT TO EXCEED 50 LBS.

[4] BORDER AREA, WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS WITH THE EXCEPTION OF CABINET PANEL SCREW FASTENERS.

[5] THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA. NO CHASSIS VENTILATOR HOLES WILL BE EFFECTIVE IN THIS AREA. THE WALL IN THIS AREA SHALL HAVE SUFFICIENT STRENGTH TO ADEQUATELY SUPPORT THE COUNTER.
INPUTS MUST BE TOTALLY ISOLATED FROM THE CHASSIS, POWER SOURCE, AND THE FRAME.
DATA SOURCE:
BECKMAN INSTRUMENTS INC., BERKELEY DIV.,
RICHMOND, CALIF.
REVERSING EPUT METER MODEL 3350/6.

[6] CONNECTOR INFORMATION

J3, J4, J5, J6, J7, J8 — BNC UG-1094/U

J9 POWER INPUT
MS3112E16-8P

PIN NO.	SIGNAL
A	CHASSIS
B	
C	
D	INPUT POWER HI
E	INPUT POWER LO
F	
G	
H	

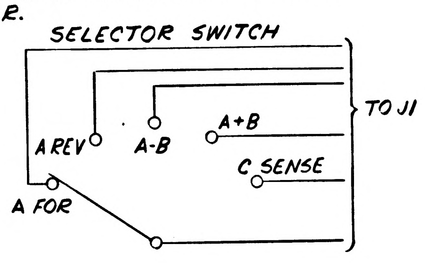
J1 SIGNAL OUTPUT
MS3112E22-55S

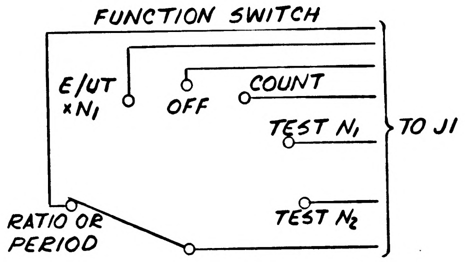
PIN NO.	SIGNAL	
B	1	DIGIT 1 OR LSD
C	2	
D	4	
E	8	
A		
F		
G		
H	1	DIGIT 2
J	2	
K	4	
L	8	
M		
N		
P	1	DIGIT 3
R	2	
S	4	
T	8	
U		
V		
W	1	DIGIT 4
X	2	
Y	4	
Z	8	
a		
b	1	DIGIT 5
$\bar{c}$	2	
d	4	
e	8	
f		
g	1	DIGIT 6 MSD
h	2	
i	4	
j	8	

PIN NO.	SIGNAL	
$\bar{k}$		
m	PRINT-OUT COLOR CONTROL	
n	-14 VOLTS	
$\bar{p}$	SIGN INDICATOR; "0"=(+), "1"=(-)	
r	PRINT COMMAND, OR READOUT CONTROL	
$\bar{s}$	PRINT COMPLETE (AN INPUT SIGNAL)	
t	SIGNAL GROUND	
u		
v		
w	A FWD	[7] SIGNALS FROM THE SELECTOR SWITCH
$\bar{x}$	A REV	
y	A−B	
z	A+B	
AA	C SENSE	
BB		
EE	OFF	[7] SIGNALS FROM THE FUNCTION SWITCH
FF	COUNT	
CC	RATIO OR PERIOD	
DD	EPUT × N_1	
GG	TEST N_1	
HH	TEST N_2	

J2 SIGNAL OUTPUT
MS 3112E-22-55 SW
PIN LIST IS THE SAME AS FOR J1 EXCEPT THAT PINS m, n, $\bar{s}$, t, w, $\bar{x}$, y, z, AA, EE, FF, GG, AND HH ARE SPARES.

SWITCH CONTACTS FOR USES EXTERNAL TO THE COUNTER.





[7] THE SIGNALS FROM THE SWITCHES WILL GO TO RELAY COILS, WITH EACH RELAY HAVING A COIL VOLTAGE OF -12VDC TO +28VDC AND A CURRENT RATING OF 0.5A.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 **DATE** 24 Apr 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS + — − —
ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN W. MUNSON DATE 17 JAN 63
CHECKED P. Remde 24 JAN 63
APPROVAL 25 JAN 63
APPROVAL 25 JAN 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER

CODE IDENT NO.
SIZE D
1900032
SCALE —
SHEET 4 OF 4

MIL 10770—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900033

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC 186341.	TDRR 01474	16 MAY 63 6 June 63	W.S. WK

Ⓜ

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

Ⓐ REPLACED WITH CHANGE BY REVISION B

							SLIDES
			2			1900015-061	HANDLES
			1			1900021-011	POWER SUPPLY, GUIDANCE
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44259
DRAWN E. LITZOW DATE 4-4-63
CHECKED Mai Kaunter 10 APR 63
APPROVAL R. Kordes 4/10
APPROVAL A. Wodel 10 APR 63
NASA APPROVAL Whitlock 4/24/63
J Gilmore 4-24-63
MIT APPROVAL W Kupfer 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
GUIDANCE SYSTEM
ASSEMBLY

CODE IDENT NO.
SIZE C
1900033
SCALE —
SHEET

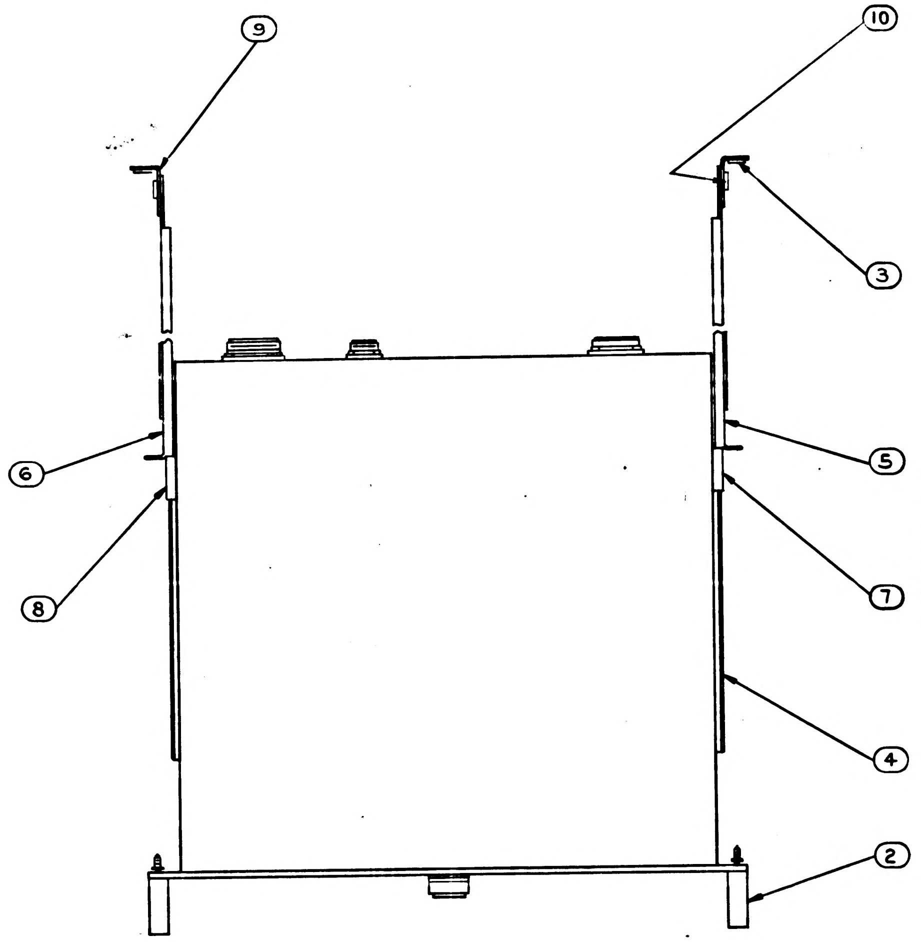
1900033

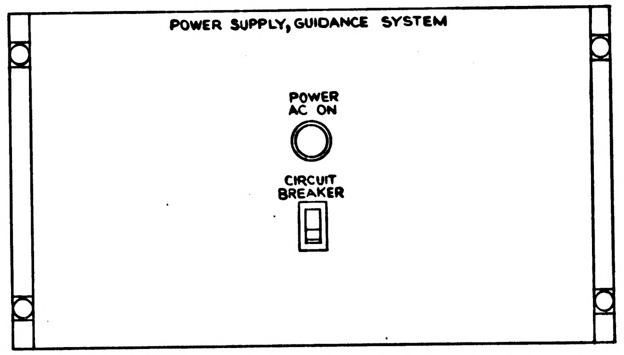
MIL 1078C—P

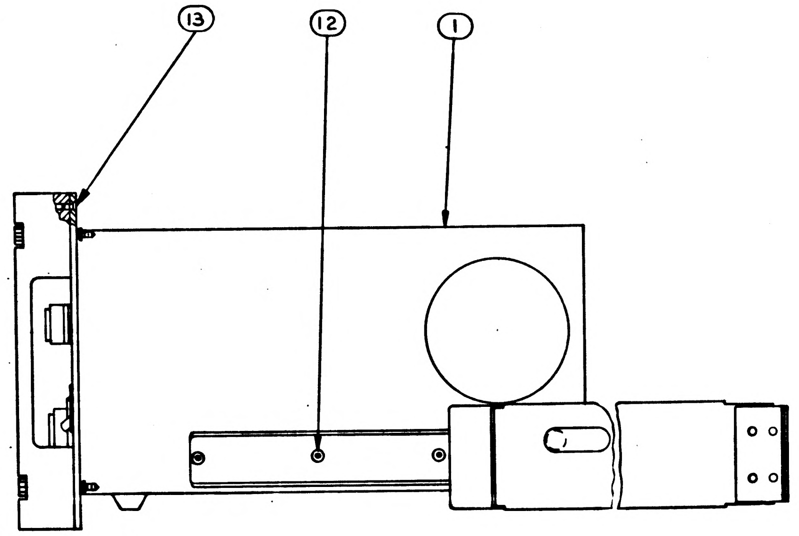
INCHES
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
IDENTIFY USING DRAWING NO. AND REVISION
LETTER PER MIL-STD-130 (ES-267)
TORQUE ITEM ⑫ TO 37-40 INCH POUNDS AT INSTALLATION.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 86341	TORR	9 MAY 63	
		To replace Rev A.		5 June	







FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01474 DATE 5 June 63

Ⓑ REPLACES REVISION A
WITH CHANGE B

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			8		13	1015831-257	SCREW-FLAT HD, 100°, HEX SOCKET
			8		12	1015826-296	SCREW-FLAT HD, HEX SOCKET
			1		11		NAMEPLATE
			6		10	1015796-001	NUT-BAR
			2		9	1015795-001	BRACKET-SUPPORT
			1		8	1015794-002	SLIDE-INTERMEDIATE SECTION
			1		7	1015794-001	SLIDE-INTERMEDIATE SECTION
			1		6	1015793-002	SLIDE-STATIONARY SECTION
			1		5	1015793-001	SLIDE-STATIONARY SECTION
			2		4	1015792-016	SLIDE, FRONT SECTION
			2		3	1015790-001	SPACER-BAR
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900021-011	POWER SUPPLY GUIDANCE SYS

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44259

		DATE
DRAWN		4 APR 63
CHECKED		10 APR 63
APPROVAL	R. Kondus	10 APR 63
APPROVAL		10 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
GUIDANCE SYSTEM
ASSEMBLY

CODE IDENT NO.
SIZE E
1900033
SCALE HALF
SHEET

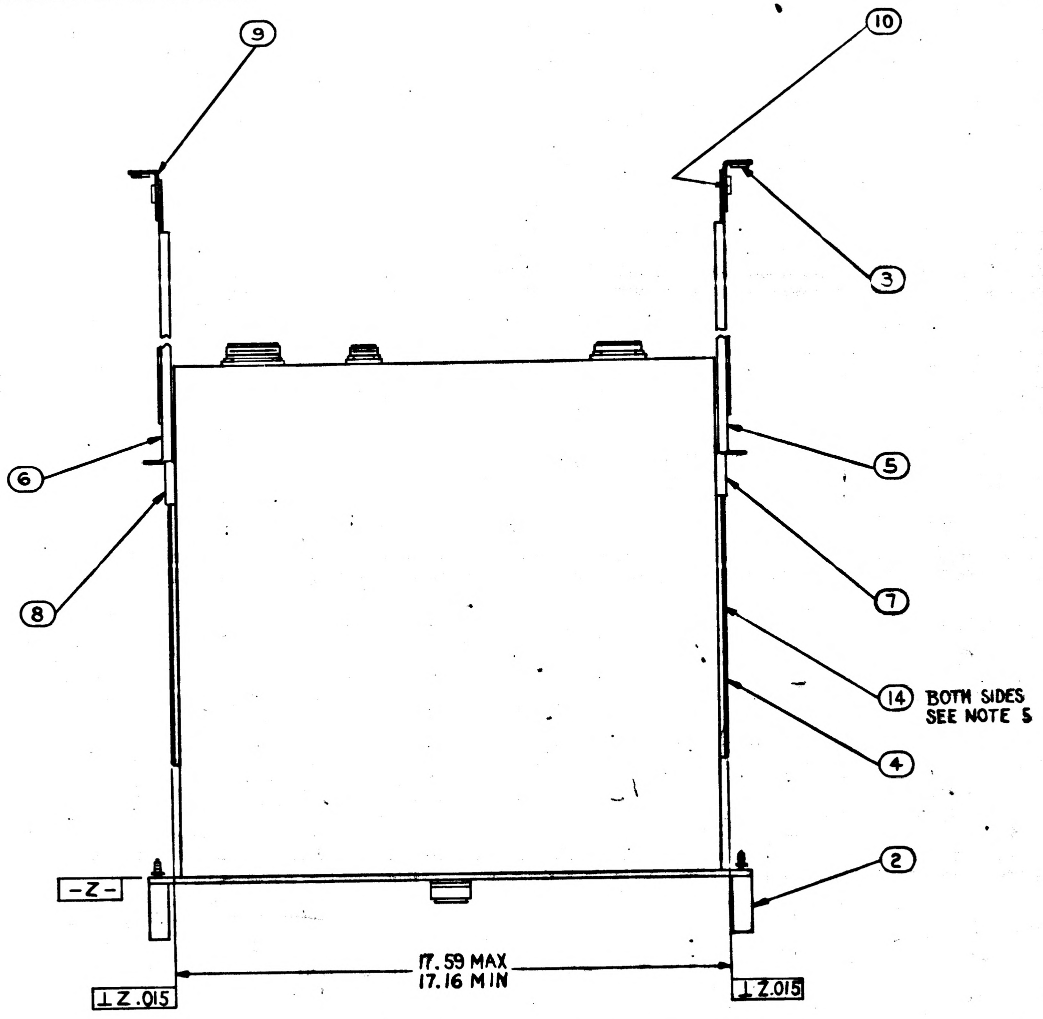
1900033 B

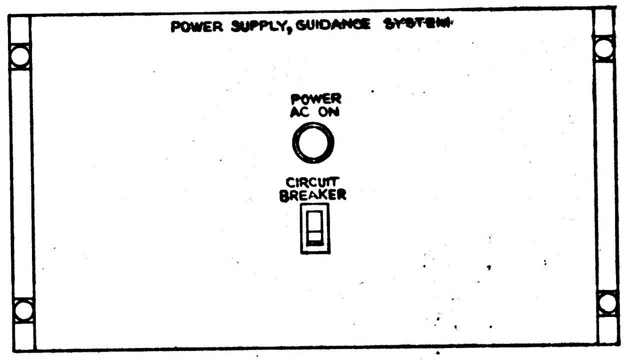
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

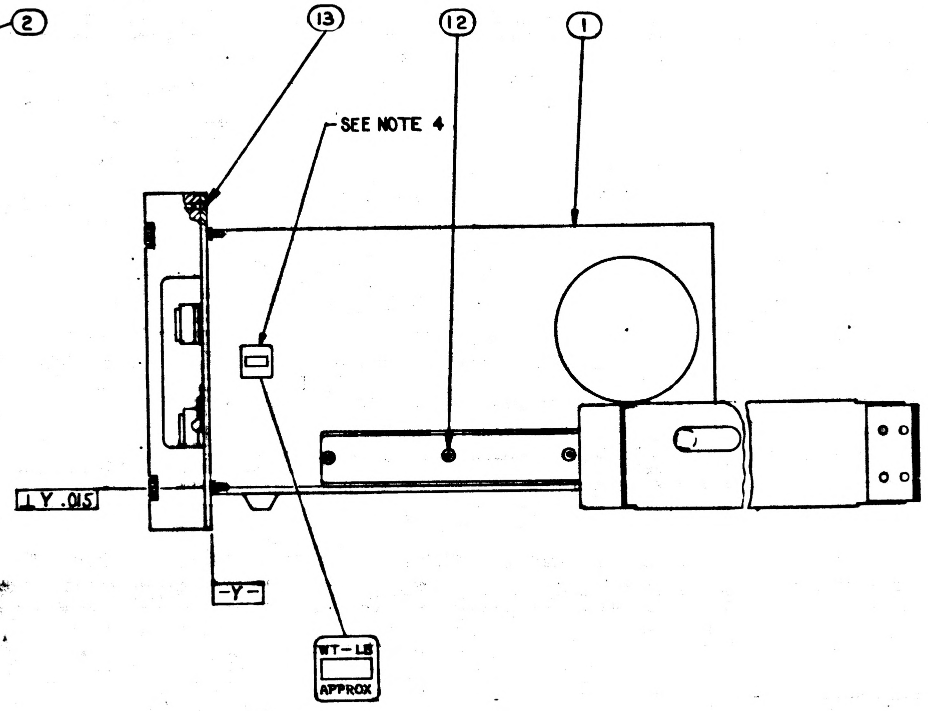
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY ~~MIL-D-70327~~
2. IDENTIFY USING ~~DRAWING NO. AND~~ REVISION LETTER PER MIL-STD-130 (ES-267)
3. TORQUE ITEM ⑫ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT (140 LB) PER ND 1002123.
5. SHIM TO FIT USING QUANTITY REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		COMPLETELY REVISED AND REDRAWN PER MXC 86341	TDRR	9 MAY 63	ARS
Ⓐ		To replace Rev A.		5 June 63	
C		REVISED IN ACCORDANCE WITH MXC 188469		31 JUL 63	
Ⓜ D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 04483		29 OCT 63	J.J.J.







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01474 DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

			4		15	AN 535-00-4	(1897109-004) SCREW, DRIVE	
			10		14	1016005-1	SHIM, LAMINATED	
			8		13	1015831-257	SCREW-FLAT HD, 100°, HEX SOCKET	
			8		12	1015826-296	SCREW-FLAT HD, HEX SOCKET	
			1		11	1900704	NAMEPLATE	
			6		10	1015790-001	NUT-BAR	
			2		9	1015795-001	BRACKET-SUPPORT	
			1		8	1015794-002	SLIDE-INTERMEDIATE SECTION	
			1		7	1015794-001	SLIDE-INTERMEDIATE SECTION	
			1		6	1015793-002	SLIDE-STATIONARY SECTION	
			1		5	1015793-001	SLIDE-STATIONARY SECTION	
			2		4	1015792-016	SLIDE, FRONT SECTION	
			2		3	1015796-001	SPACER-BAR	
			2		2	1900015-061	HANDLE ASSEMBLY	
			1		1	1900021-011	POWER SUPPLY GUIDANCE SYS	
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS			

NEXT ASSY	USED ON
1900145	1900145
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44259
DRAWN DATE 4 APR 63
CHECKED 10 APR 63
APPROVAL R. Kondes 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
GUIDANCE SYSTEM
ASSEMBLY

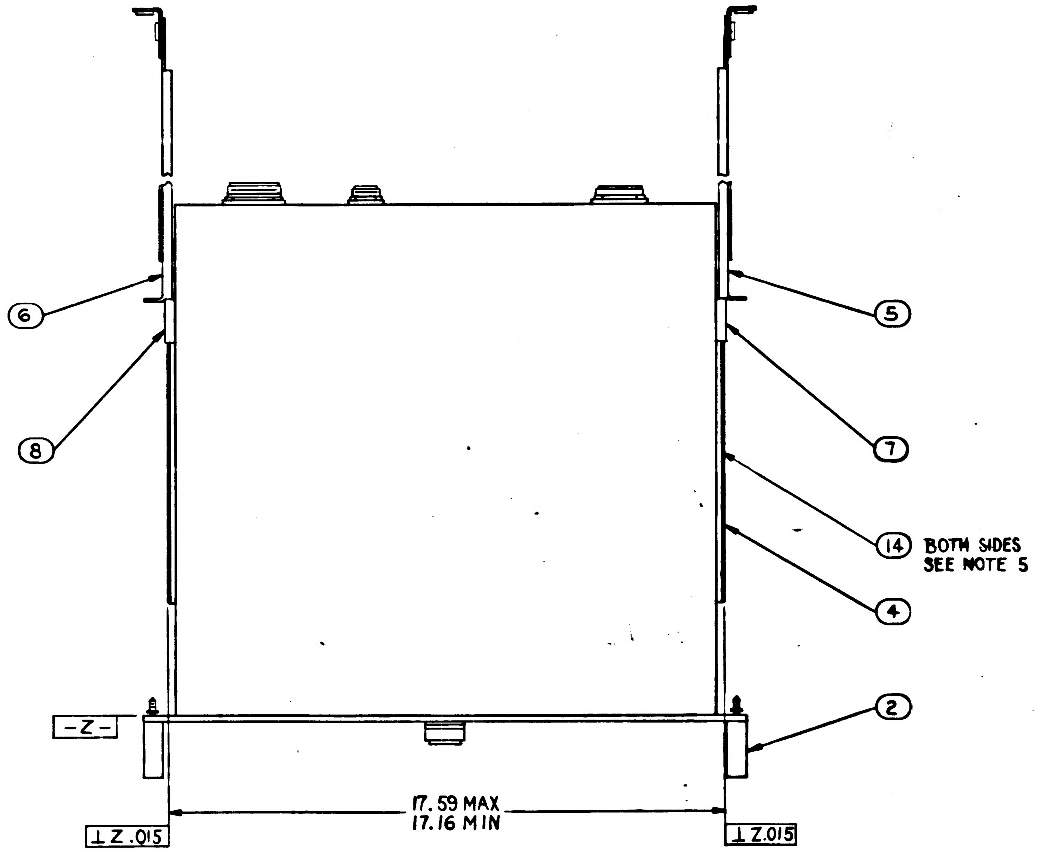
CODE IDENT NO.
SIZE E
1900033
SCALE HALF
SHEET

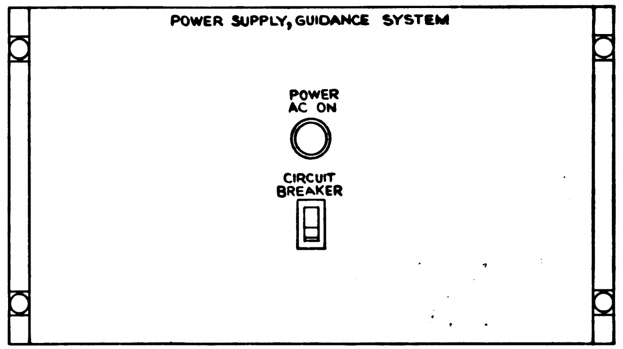
INCHES
PHOTOGRAPHIC SCALE ONLY

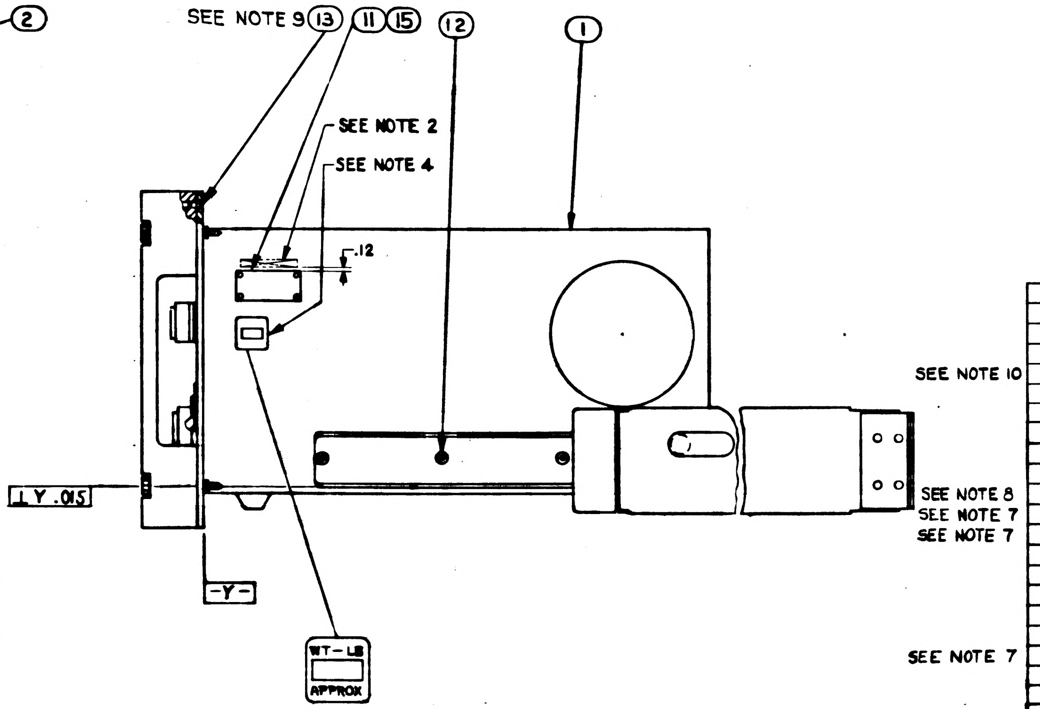
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MARK APPLICABLE REVISION LETTER (REV __) PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑫ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT (140 LB) PER ND 1002123.
5. SHIM TO FIT USING QUANTITY REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND1002023.
7. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION
8. MARK APPLICABLE CONT. NO. & SERIAL NO. ON ITEM 11 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH
9. SECURE SCREWS USING ITEM ⑯
10. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186341	TORR	9 MAY 63	ARS
Ⓑ		To replace Rev A.		5 June 63	WK
C		REVISED IN ACCORDANCE WITH MXC 188469		31 JUL 63	
Ⓜ D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TORR		29 OCT 63	J.J.J. WK
E		CHANGE IN ACCORDANCE WITH 92657		8 JAN 64	JG JEW
F		CHANGE IN ACCORDANCE WITH 94034 PER TORR 00176	—	29 JAN 64	JJJ MEM
G		CHANGE IN ACCORDANCE WITH 194130 PER TORR 00177	—	29 JAN 64	JJJ MEM
H		CHANGE IN ACCORDANCE WITH CN 196414 PER TORR 00178		1 APR 64	CJL RP







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01477 DATE 6 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 10	☒		17	PS1900033	PROCUREMENT SPECIFICATION
	AR		16	MIL-S-40083-C130	ES-2544-5 SEALING COMPOUND
	4		15	AN535-00-4	(1897109-004) SCREW, DRIVE
	10		14	1016005-1	SHIM, LAMINATED
	8		13	1015831-253	SCREW-FLAT HD, 100°, HEX SOCKET
	8		12	1015826-308	SCREW-FLAT HD, HEX SOCKET
SEE NOTE 8	1		11	1901304-131	NAMEPLATE
SEE NOTE 7	4		10	1015790-001	NUT-BAR
SEE NOTE 7	2		9	1015795-001	BRACKET-SUPPORT
	1		8	1015794-002	SLIDE-INTERMEDIATE SECTION
	1		7	1015794-001	SLIDE-INTERMEDIATE SECTION
	1		6	1015793-002	SLIDE-STATIONARY SECTION
	1		5	1015793-001	SLIDE-STATIONARY SECTION
	2		4	1015792-016	SLIDE, FRONT SECTION
SEE NOTE 7	4		3	1015796-001	SPACER-BAR
	2		2	1900015-061	HANDLE ASSEMBLY
	1		1	1900021-011	POWER SUPPLY GUIDANCE SYS

LIST OF PARTS AND MATERIALS

NEXT ASSY	1900145
USED ON	1900145
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK-44259

DRAWN		4 APR 63
CHECKED		10 APR 63
APPROVAL	R. Konda	10 APR 63
APPROVAL		10 APR 63
NASA APPROVAL		
MIT APPROVAL		

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
GUIDANCE SYSTEM
ASSEMBLY

CODE IDENT NO
SIZE E
1900033
SCALE HALF
SHEET 1 OF 1

H 1900033 B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
							SLIDES
			2			1900015-061	HANDLES
			1			1900021-011	POWER SUPPLY, GUIDANCE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + —— − ——
DECIMALS + —— − ——
ANGLES + —— − ——

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44259
DRAWN E. LITZOW DATE 4-4-63
CHECKED 10 APR 63
APPROVAL R. Kordes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY,
GUIDANCE SYSTEM
ASSEMBLY

CODE IDENT NO.
SIZE C
1900033
SCALE ——
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900034

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC 186342	TDRR 01480	16 MAY 63	WS WK.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Apr 63

Ⓐ REPLACED WITH CHANGE BY REVISION B

							SLIDES
			2			1900015-051	HANDLES
			1			1900062-011	GALVANOMETER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44251
DRAWN E. LITZOW DATE 4-4-63
10 APR 63
CHECKED
APPROVAL R. Kordes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J P 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GALVANOMETER
ASSEMBLY

CODE IDENT NO.
SIZE C
1900034
SCALE
SHEET

MIL 1078C—P

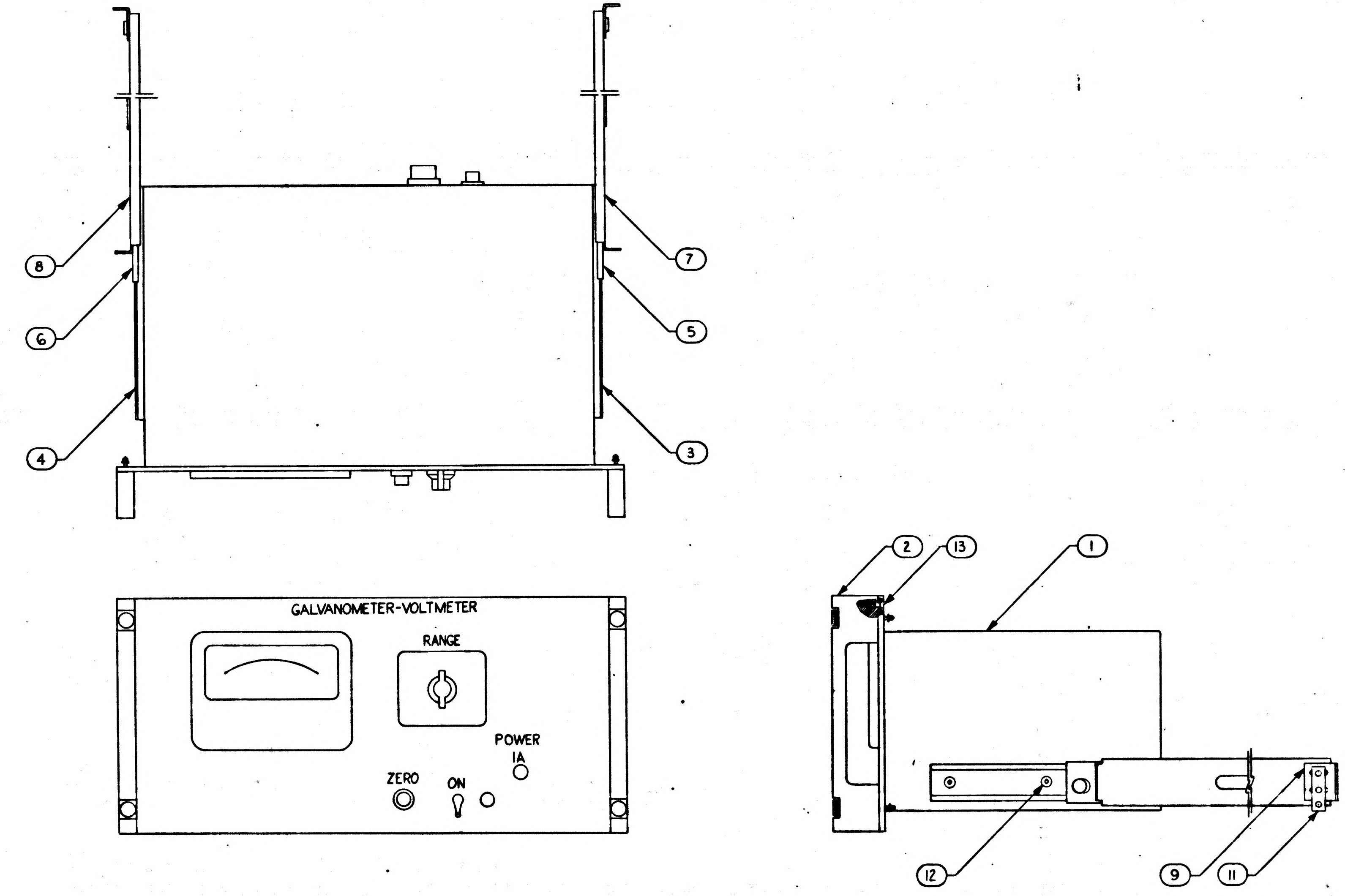
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267).

TORQUE ITEM ⑫ TO 37-40 INCH POUNDS AT INSTALLATION.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MAC 106342		9-MAY 63	
			C1480		



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1480 **DATE** 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			8		13	1015831-257	SCREW-FLAT HEAD, 100°, HEX SOCKET
			6		12	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			2		11	1015790-002	NUT-BAR
			1		10		NAMEPLATE
			2		9	1015789-001	BRACKET-ANGLE
			1		8	1015787-010	SLIDE-STATIONARY SECTION
			1		7	1015787-009	SLIDE-STATIONARY SECTION
			1		6	1015788-002	SLIDE-INTERMEDIATE SECTION
			1		5	1015788-001	SLIDE-INTERMEDIATE SECTION
			1		4	1015786-002	SLIDE-FRONT SECTION
			1		3	1015786-001	SLIDE-FRONT SECTION
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900062-011	GALVANOMETER-VOLTMETER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900034	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44251
DRAWN DATE 4 APR 63
CHECKED 10 APR 63
APPROVAL 10 APR 63
APPROVAL 11 APR 63
NASA APPROVAL Gehman 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GALVANOMETER
ASSEMBLY

CODE IDENT NO.
SIZE E
1900034
SCALE —
SHEET 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267).

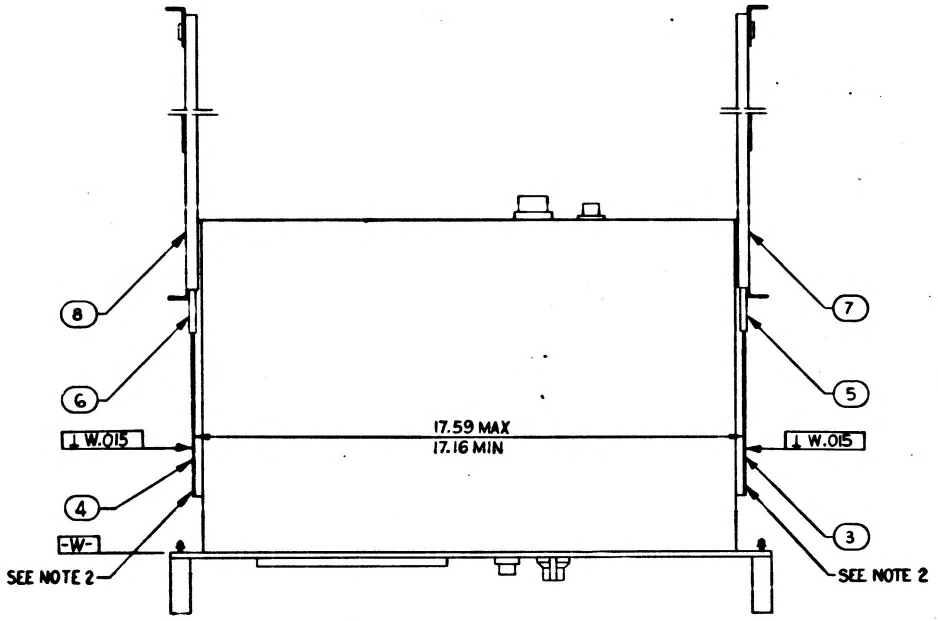
TORQUE ITEM ⑫ TO 37-40 INCH POUNDS AT INSTALLATION.

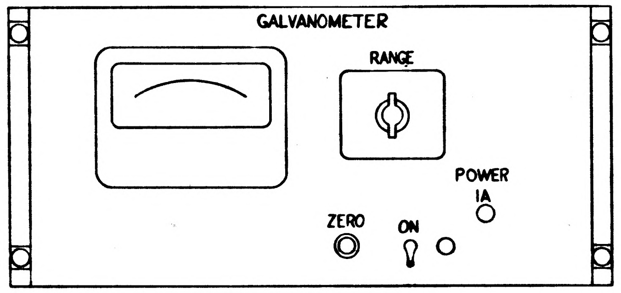
1. MARK WEIGHT PER ND 1002123 (21LB)

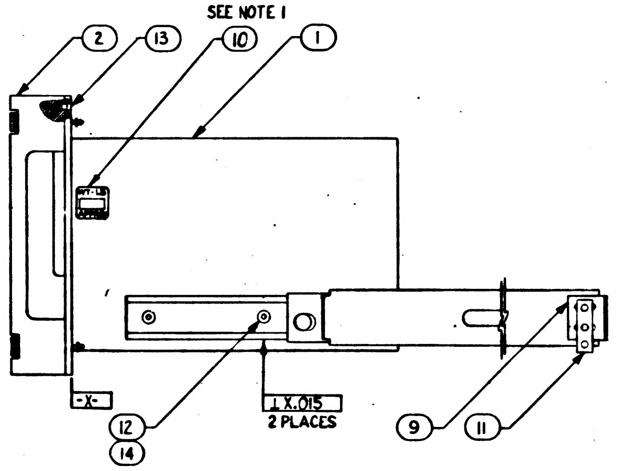
2. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.

3. SERIALIZE PER ND 1002023

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186342		3-MAY 63	
		Reissued Rev A.	01480	5 June 63	
C		CHANGE IN ACCORDANCE WITH MXC 189016		10 SEP 63	
D		CHANGE IN ACCORDANCE WITH MXC 19140 PER TDRR 06158		28 OCT 63	







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01480 DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1		16	1900704	NAMEPLATE
			4		15	AN535-00-4	(1897109-004) SCREW, DRIVE
			6		14	1016005-1	SHIM, LAMINATED
			8		13	1015831-257	SCREW-FLAT HEAD, 100°, HEX SOCKET
			6		12	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			2		11	1015790-002	NUT-BAR
			1		10		NAMEPLATE
			2		9	1015789-001	BRACKET-ANGLE
			1		8	1015787-010	SLIDE-STATIONARY SECTION
			1		7	1015787-009	SLIDE-STATIONARY SECTION
			1		6	1015788-002	SLIDE-INTERMEDIATE SECTION
			1		5	1015788-001	SLIDE-INTERMEDIATE SECTION
			1		4	1015786-002	SLIDE-FRONT SECTION
			1		3	1015786-001	SLIDE-FRONT SECTION
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900062-011	GALVANOMETER

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK 4425

DRAWN 4 APR 63
CHECKED 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL
L Geerman 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GALVANOMETER
ASSEMBLY

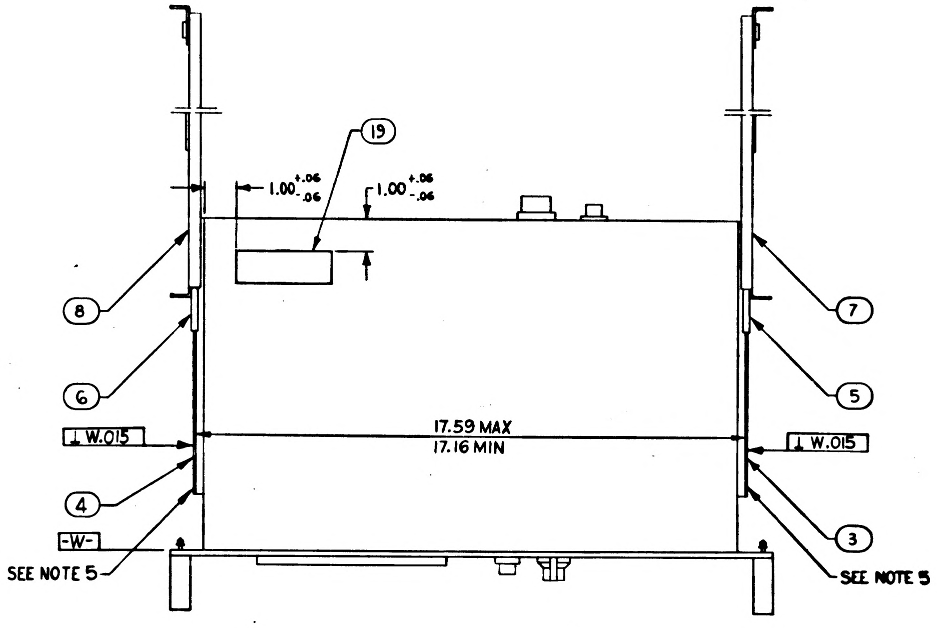
CODE IDENT NO
SIZE E
1900034
SCALE —
SHEET 1

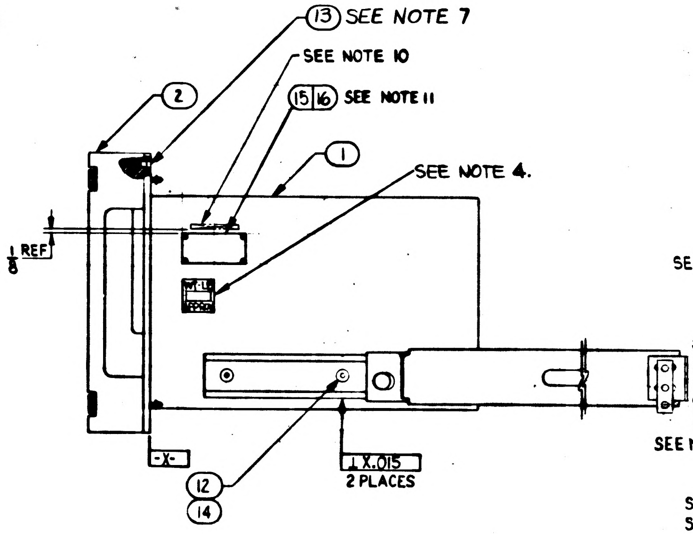
NOTES:

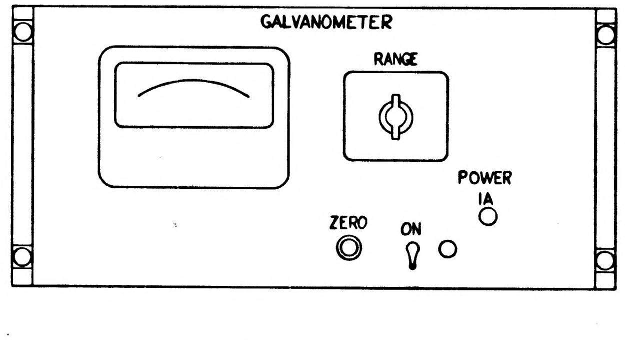
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267).
3. TORQUE ITEM ⑫ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT PER ND 1002123 (21LB)
5. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023
7. *SECURE SCREWS USING ITEM ⑰.*
8. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION
9. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLEY FROM ITS HIGHER ASSEMBLY.
10. MARK APPLICABLE REVISION LETTER (REV___) .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
11. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM ⑯ IN ACCORDANCE WITH ND 1002033. LETTERS AND NUMERALS TO BE .06 HIGH.
12. VENDOR ITEM - SEE SPEC CONTROL DRAWING.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186342	TDRR	9 MAY 63	
		[illegible] New A.	[illegible]	[illegible]	wK
C		CHANGE IN ACCORDANCE WITH MXC 189016		10 SEP 63	RW
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 06156		29 OCT 63 2-6-64	
E		CHANGE IN ACCORDANCE WITH CM-94131 PER TDRR 08193		18 FEB 64	MEM
F		CHANGE IN ACCORDANCE WITH CM-94674		20 FEB 64	PTW
G		CHANGE IN ACCORDANCE WITH CM 96018		MAR 64	MEM
H		CHANGE IN ACCORDANCE WITH CM 196205 PER TDRR 08194	—	26 MAR 64	MEM
—		ADDED CUSTOMER DATA (2-64)	—		







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. [illegible] DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
				1		19	1900953 -001	PLATE, WARNING
SEE NOTE 9				X		18	PS 1900034	PROCUREMENT SPECIFICATION
				AR		17	*MIL-S-40083-C130*	*SEALING COMPOUND (ES-2544-5)*
				1		16	1901304-132	NAMEPLATE
				4		15	AN535-00-4	(1897109-004) SCREW, DRIVE
SEE NOTE 12				6		14	1016005-1	SHIM, LAMINATED
SEE NOTE 12				8		13	1015831-253	SCREW-FLAT HEAD, 100°, HEX SOCKET
SEE NOTE 12				6		12	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
SEE NOTE 8 &12				4		11	1015790-002	NUT-BAR
				~~1~~		~~10~~		~~NAMEPLATE~~
SEE NOTES 8 & 12				2		9	1015789-001	BRACKET-ANGLE
				1		8	1901595-021	SLIDE-STATIONARY SECTION
				1		7	1901595-011	SLIDE-STATIONARY SECTION
SEE NOTE 12				1		6	1015788-002	SLIDE-INTERMEDIATE SECTION
SEE NOTE 12				1		5	1015788-001	SLIDE-INTERMEDIATE SECTION
SEE NOTE 12				1		4	1015786-002	SLIDE-FRONT SECTION
SEE NOTE 12				1		3	1015786-001	SLIDE-FRONT SECTION
				2		2	1900015-051	HANDLE ASSEMBLY
				1		1	1900062-011	GALVANOMETER

LIST OF PARTS AND MATERIALS

NEXT ASSY	*1900145*
USED ON	*1900145*
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+—	+—	+—
——	——	——

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK 44251

DRAWN		4 APR 63
CHECKED		10 APR 63
APPROVAL	R Korda	10 APR 63
APPROVAL		10 APR 63
NASA APPROVAL		
MIT APPROVAL		

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GALVANOMETER
ASSEMBLY

CODE IDENT NO.	SIZE	
	E	1900034
SCALE —		SHEET

1900034

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 DATE 24 Ap. 63

								SLIDES
			2				1900015-051	HANDLES
			1				1900062-011	GALVANOMETER
			011	EFFECTIVITY		ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ —	+ —
− —	− —	− —

DO NOT SCALE THIS DRAWING

MATERIAL ——

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK 44251

DRAWN E. LITZOW DATE 4-4-63
10 APR 63
CHECKED
APPROVAL R. Kordes 4/10
APPROVAL 10 APR 63

NASA APPROVAL 4/24/63
J P 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GALVANOMETER
ASSEMBLY

CODE IDENT NO.
SIZE C
1900034
SCALE ——
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

Ⓜ

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APP'D.
A		REPLACED WITH CHANGE BY REVISIONB PER MXC186343	TDRR 01478	10 MAY 63	L/ARS

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00 999 **DATE** 24 Apr 63

Ⓐ REPLACED WITH CHANGE BY REVISION B

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	SLIDES
			2			1900015-031	HANDLES
			1			1900029-011	POWER SUPPLY
			011				

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44284
DRAWN E. LITZOW DATE 4-4-63
CHECKED 10 APR 63
APPROVAL R. Kordes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
ELECTRONICS
ASSEMBLY

CODE IDENT NO.
SIZE C
1900035
SCALE
SHEET

MIL 1078C—P

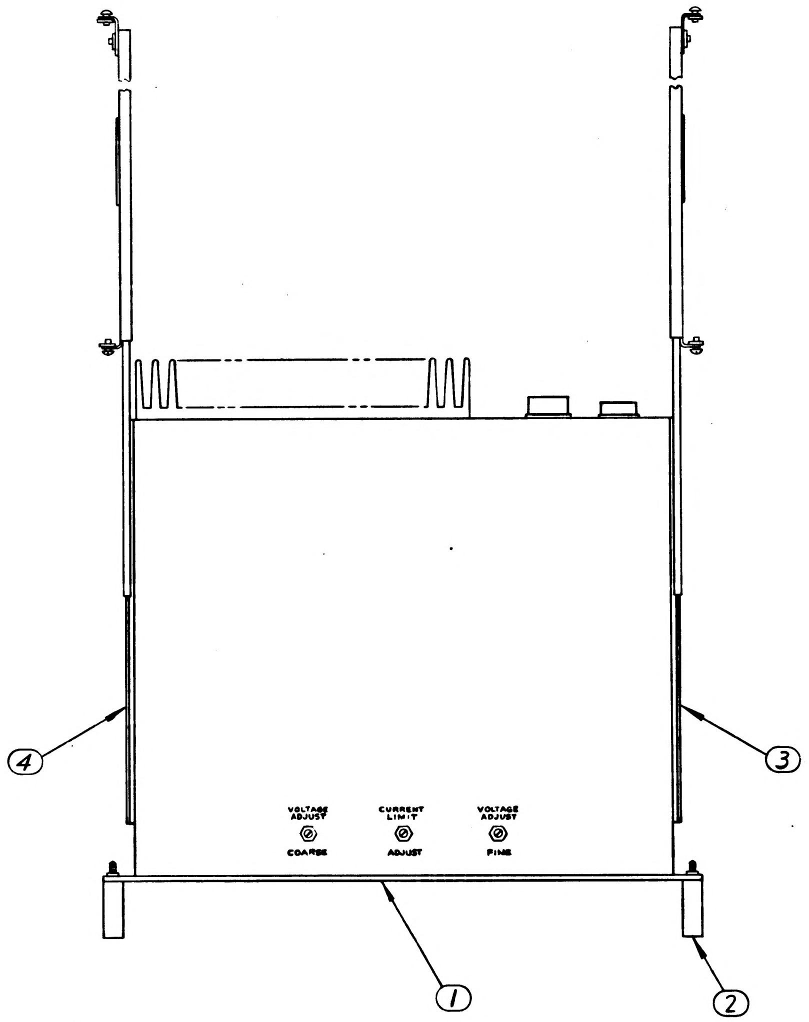
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

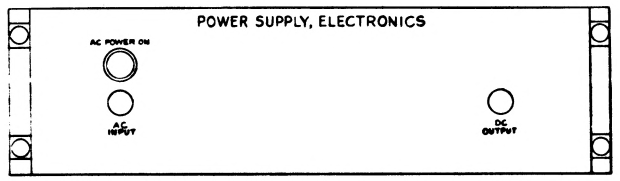
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186343	~~452~~ C1478	10 MAY 63	GCS HRS
		Replaces Rev A			

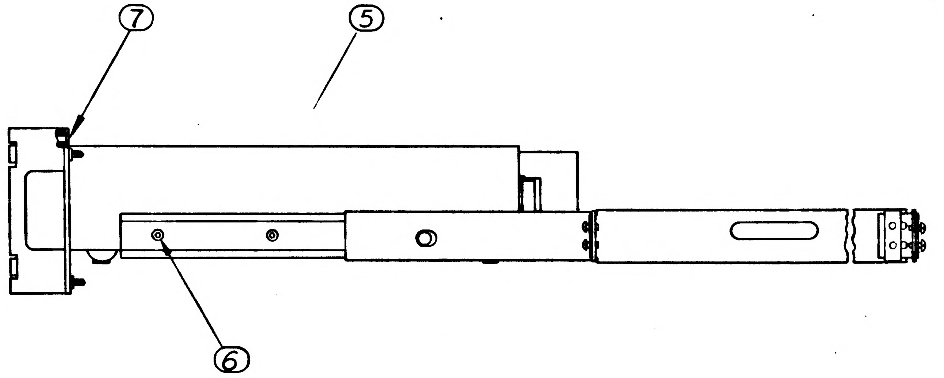
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-267)

TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1478 **DATE** 5 Jun 63

Ⓑ *REPLACES REVISION A WITH CHANGE B*

			4		7	1015831-257	SCREW, FLAT HEAD, 100° HEX SOCKET
			8		6	1006783-44	SCREW, BUTTON HEAD, HEX. SOCKET
			1		5		NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE
			2		2	1900015-031	HANDLE ASSEMBLY
			1		1	1900029-011	POWER SUPPLY, ELECTRONICS
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-947

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44284
DRAWN ELITZOW DATE 4 APR 63
MALEKOWSKI 8 APR 63
CHECKED
R. KORDES 10 APR 63
APPROVAL
A.J. KODEL 10 APR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY, ELECTRONICS
ASSEMBLY

CODE IDENT NO
SIZE E
1900035
SCALE 1:2
SHEET

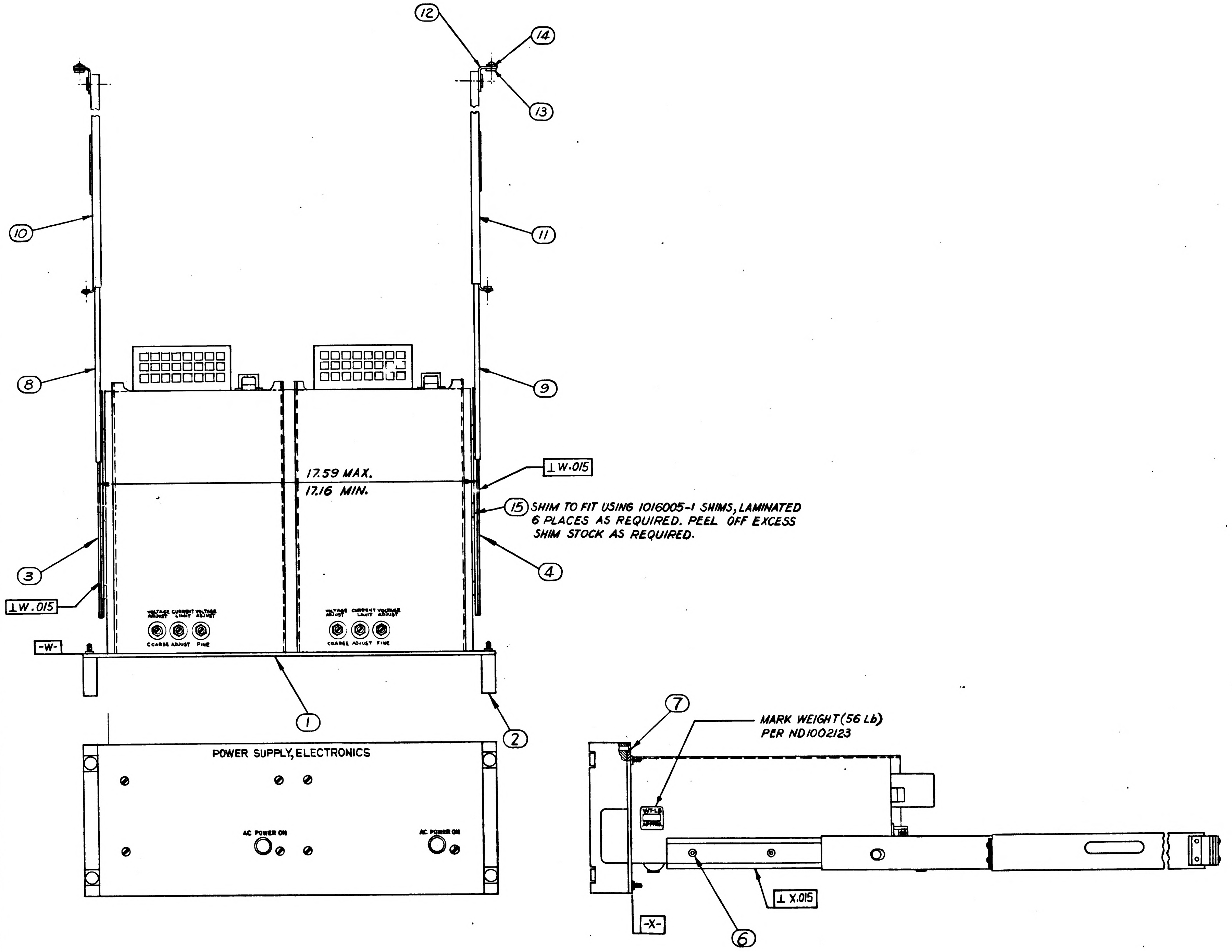
1900035 B

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186343	C1478	10 MAY 63	JRS
		REPLACES REVISION A WITH CHANGE			
B1		CHANGED IN ACCORDANCE WITH MXC-187132		26 JUNE 63	
C		CHANGED IN ACCORDANCE WITH MXC-187429		26 JUNE 63	
D		CHANGE IN ACCORDANCE WITH MXC 187927 PER TDRR 03876			

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-267)

TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.



⑫
⑭
⑬
⑩
⑪
⑧
⑨
17.59 MAX.
17.16 MIN.
⊥W.015
⑮ SHIM TO FIT USING 1016005-1 SHIMS, LAMINATED 6 PLACES AS REQUIRED. PEEL OFF EXCESS SHIM STOCK AS REQUIRED.
③
④
⊥W.015
VOLTAGE ADJUST
CURRENT LIMIT
VOLTAGE ADJUST
COARSE ADJUST FINE
-W-
①
②
POWER SUPPLY, ELECTRONICS
AC POWER ON
AC POWER ON
⑦
MARK WEIGHT (56 Lb) PER ND1002123
WT-LB
APPRVL
⊥X.015
-X-
⑥

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01478 DATE 6 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

			QTY	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			4R		15	1016005-1	SHIM, LAMINATED
			2		14	1015796-002	BAR SPACER
			6		13	1015790-002	BAR, NUT
			2		12	1015789-001	REAR SUPPORT BRACKET
			1		11	1015786-001	SLIDE-FRONT SECTION R.H.
			1		10	1015786-002	SLIDE-FRONT SECTION L.H.
			1		9	1015788-001	SLIDE-INTERMEDIATE SECTION R.H.
			1		8	1015788-002	SLIDE-INTERMEDIATE SECTION L.H.
			8		7	1015831-257	SCREW, FLAT HEAD, 100° HEX SOCKET
			6		6	1006783-44	SCREW, BUTTON HEAD, HEX. SOCKET
			1		5		NAMEPLATE
			1		4	1015787-010	SLIDE-STATIONARY SECTION R.H.
			1		3	1015787-009	SLIDE-STATIONARY SECTION L.H.
			2		2	1900015-041	HANDLE ASSEMBLY
			1		1	1900029-011	POWER SUPPLY, ELECTRONICS
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-947

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN ELITZOW DATE 4 APR 63
MALEKOWSKI 8 APR 63
CHECKED R. KORDES 10 APR 63
APPROVAL A.J. KODEL 10 APR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

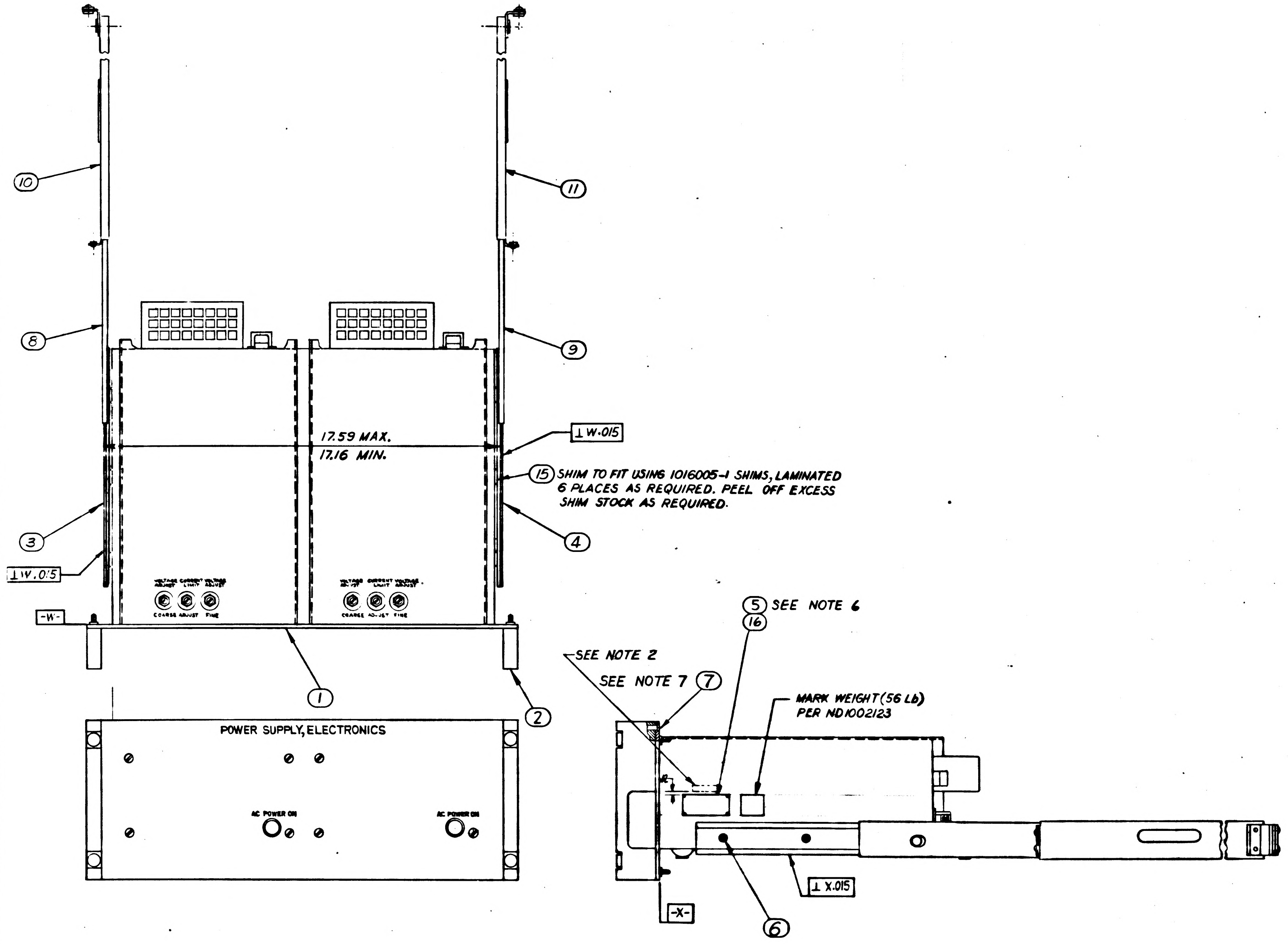
POWER SUPPLY, ELECTRONICS
ASSEMBLY

CODE IDENT NO. SIZE E 1900035
SCALE 1:2 SHEET

1900035 D B

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186343 REPLACES REVISION A WITH CHANGE	C1476	10 MAY 63	ARS
B1		CHANGED IN ACCORDANCE WITH MXC-187132		26 JUNE 63	JJJ
C		CHANGED IN ACCORDANCE WITH MXC-187429		26 JUNE 63	JJJ
D		CHANGE IN ACCORDANCE WITH MXC 187927 PER TDRR 03276		5 JUL 63 15 OCT 63	WK
E		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 08162		NOV 63	WSM
F		CHANGED IN ACCORDANCE WITH CM-192658. PER TDRR 08163		27 DEC 63	RJM
G		CHANGE IN ACCORDANCE WITH CV 94132 PER TDRR 08164		15 JAN 64	JJJ PBR
H	-	CHANGE IN ACCORDANCE WITH CM-95221	-	18-MAR-64	JM MEM
J	C-2	CHANGE IN ACCORDANCE WITH CM 196019	-	30 MAR 64	JWP
K	B-2	CHANGE IN ACCORDANCE WITH CM 96206 REVISED PER TDRR PER TDRR 08165		APR 64	JWP

1. INTEPPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV___) PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. SERIALIZE PER ND 1002023
5. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.
6. MARK APPLICABLE CONT. NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
7. SECURE SCREWS USING ITEM 17.
8. THIS SPECIFICATION APPLIES ONLY WHEN THE EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY. APPLY IT TO EACH OF THE SUPPLIES IN THE ELECTRONIC POWER SUPPLY, OR TO THE ASSEMBLY, WHICHEVER IS APPLICABLE.



⑩
⑧
③
⊥W.015
-W-
⑪
⑨
④
⊥W.015
17.59 MAX.
17.16 MIN.
⑮ SHIM TO FIT USING 1016005-1 SHIMS, LAMINATED 6 PLACES AS REQUIRED. PEEL OFF EXCESS SHIM STOCK AS REQUIRED.
VOLTAGE ADJUST CURRENT LIMIT VOLTAGE ADJUST
COARSE ADJUST FINE
①
②
POWER SUPPLY, ELECTRONICS
AC POWER ON
AC POWER ON
⑤ SEE NOTE 6
⑯
SEE NOTE 2
SEE NOTE 7 ⑦
MARK WEIGHT (56 LB) PER ND1002123
⊥X.015
-X-
⑥

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01479 DATE 6 Jun 63

Ⓑ REPLACES REVISION A WITH CHANGE B

SEE NOTE 8

SEE NOTE 5

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		18	PS-1900035	PROCUREMENT SPECIFICATION
			AR		17	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
			4		16	AN535-00-4	SCREW, DRIVE
			AR		15	1016005-1	SHIM, LAMINATED
			~~2~~		~~14~~	~~1015796-002~~	~~BAR SPACER~~
			4		13	1015790-002	BAR, NUT
			2		12	1015789-001	REAR SUPPORT BRACKET
			1		11	1015786-001	SLIDE-FRONT SECTION R.H.
			1		10	1015786-002	SLIDE-FRONT SECTION L.H.
			1		9	1015788-001	SLIDE-INTERMEDIATE SECTION R.H
			1		8	1015788-002	SLIDE-INTERMEDIATE SECTION L.H
			8		7	1015831-253	SCREW, FLAT HEAD, 100°, HEX SOCKET
			6		6	1006783-44	SCREW, BUTTON HEAD, HEX. SOCKET
			1		5	1901304-112	NAMEPLATE (AS APPLICABLE)
			1		4	1901595-021	SLIDE-STATIONARY SECTION R.H.
			1		3	1901595-011	SLIDE-STATIONARY SECTION L.H.
			2		2	1900015-041	HANDLE ASSEMBLY
			1		1	1900029-011	POWER SUPPLY, ELECTRONICS

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-947

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN ELITZOW DATE 4 APR 63
MALEKOWSKI 8 APR 63
CHECKED R. KORDES 10 APR 63
APPROVAL A.J. KODEL 10 APR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY, ELECTRONICS
ASSEMBLY

CODE IDENT NO. SIZE E 1900035
SCALE 1:2 SHEET 1 OF

1900035

1900035

REVISIONS				
SYM	ZONE	DESCRIPTION CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00 999 **DATE** 24 Apr 63

						TO BE ASSIGNED	SLIDES
			2			1900015-031	HANDLES
			1			1900029-011	POWER SUPPLY
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS + — − —
ANGLES + — − —

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44284

DRAWN E. LITZOW DATE 4-4-63
10 APR 63
CHECKED
APPROVAL R. Kordes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J.P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
ELECTRONICS
ASSEMBLY

CODE IDENT NO.
SIZE C
1900035
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

(M)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC186344	TDRR 01481	13 MAY 63	~~WE~~ &IGCS VARS

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 **DATE** 24 Apr 63

(A) REPLACED WITH CHANGE BY REVISION B

						TO BE ASSIGNED	SLIDES
			2			1900015-041	HANDLES
			1			1900050-011	VOLTMETER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ —	+ —
− —	− —	− —

DO NOT SCALE THIS DRAWING

MATERIAL ——

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK44299

DRAWN E. LITZOW DATE 4-4-63
CHECKED Mel Kawton 4-12-63
APPROVAL George J. Peskuric 4-12-63
APPROVAL A. Friedel 12 APR 63

NASA APPROVAL K. Michel 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL WK for 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER-PHASE ANGLE
ASSEMBLY

CODE IDENT NO.

SIZE C

1900036

SCALE ——

SHEET

MIL 1078C-P

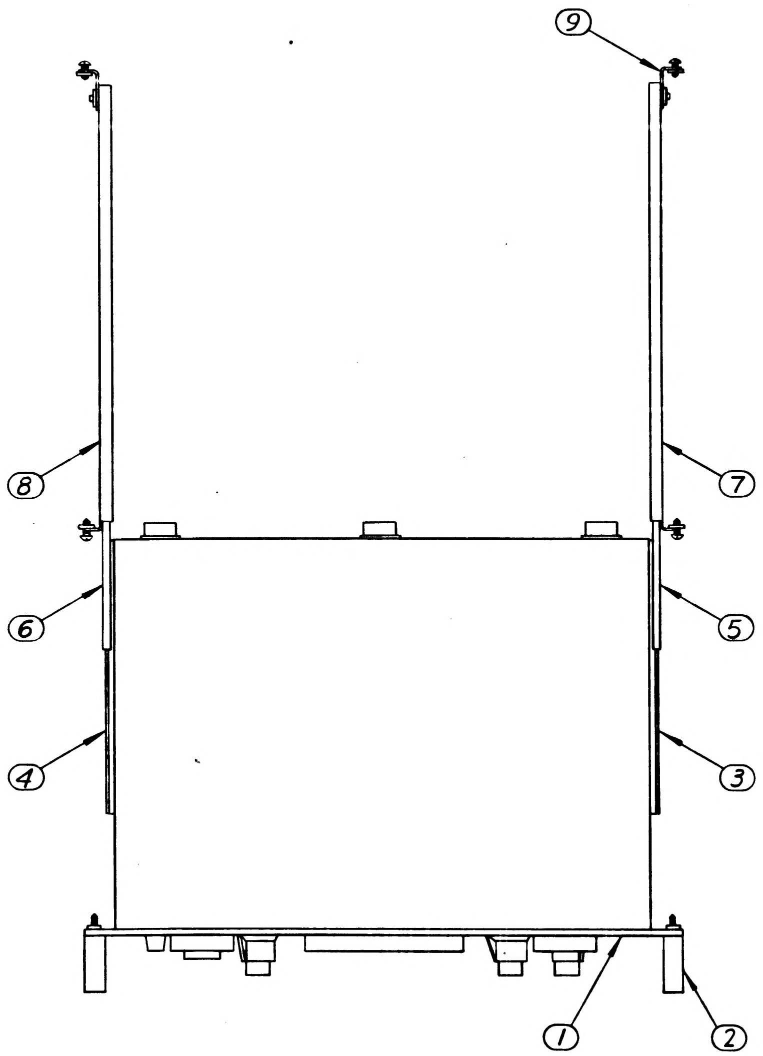
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

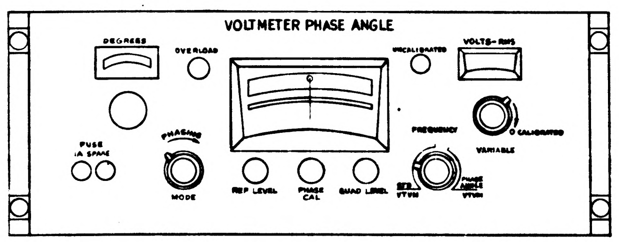
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		Replaces Rev A COMPLETELY REVISED AND REDRAWN PER MXC186344	1481	3 MAY 63	GLS ARS

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

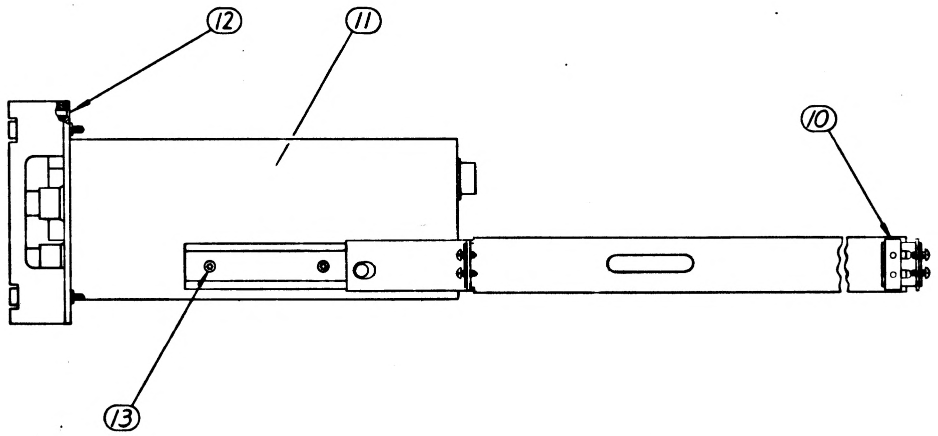
IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267)

TORQUE ITEM ⑬ TO 37-40 INCH POUNDS AT INSTALLATION.





VOLTMETER PHASE ANGLE
DEGREES
OVERLOAD
UNCALIBRATED
VOLTS-RMS
FUSE
1A SPARE
PHASING
MODE
REF LEVEL
PHASE CAL
QUAD LEVEL
FREQUENCY
CALIBRATED
VARIABLE
STD VTVM
PHASE ANGLE VTVM



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 1481 DATE

Ⓑ REPLACES REVISION A WITH CHANGE B

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			6		13	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			8		12	1015831-257	SCREW, FLAT HEAD, 90°, HEX SOCKET
			1		11		NAMEPLATE
			2		10	1015790-002	NUT-BAR
			2		9	1015789-001	BRACKET-ANGLE
			1		8	1015787-010	SLIDE-STATIONARY SECTION (L.H.)
			1		7	1015787-009	SLIDE-STATIONARY SECTION (R.H.)
			1		6	1015788-002	SLIDE-INTERMEDIATE SECTION (L.H.)
			1		5	1015788-001	SLIDE-INTERMEDIATE SECTION (R.H.)
			1		4	1015786-002	SLIDE-FRONT SECTION (L.H.)
			1		3	1015786-001	SLIDE-FRONT SECTION (R.H.)
			2		2	1900015-041	HANDLE ASSEMBLY
			1		1	1900050-011	VOLTMETER-PHASE ANGLE
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900036 B

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44299
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALEKOWSKI 12 APR 63
APPROVAL GEORGE J. PESKURICH APR 63
APPROVAL A. J. KODEL 12 APR 63
NASA APPROVAL
Beaman 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, PHASE ANGLE
ASSEMBLY

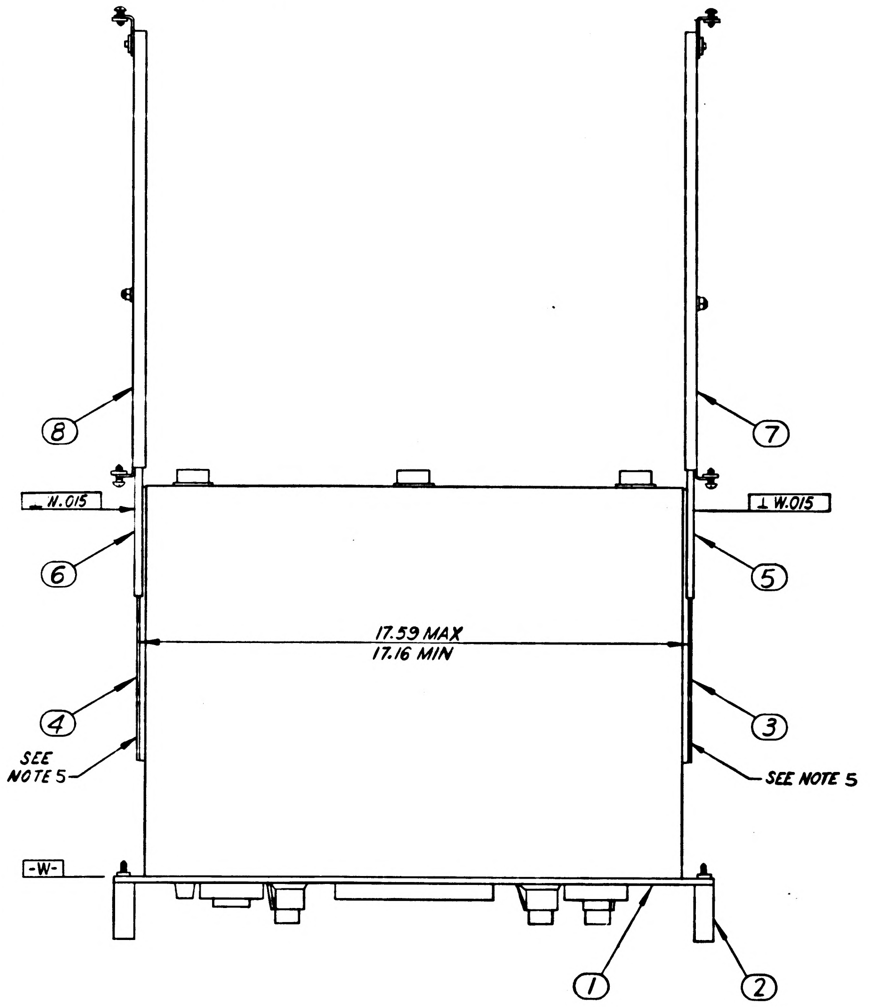
CODE IDENT NO
SIZE E
1900036
SCALE 1:2
SHEET 1

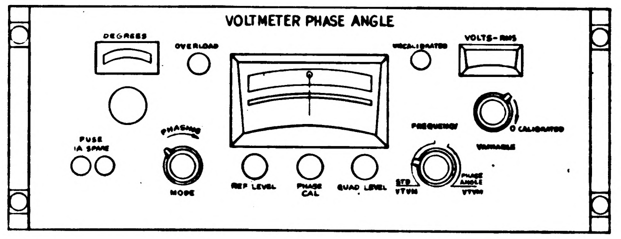
INCHES
PHOTOGRAPHIC SCALE ONLY

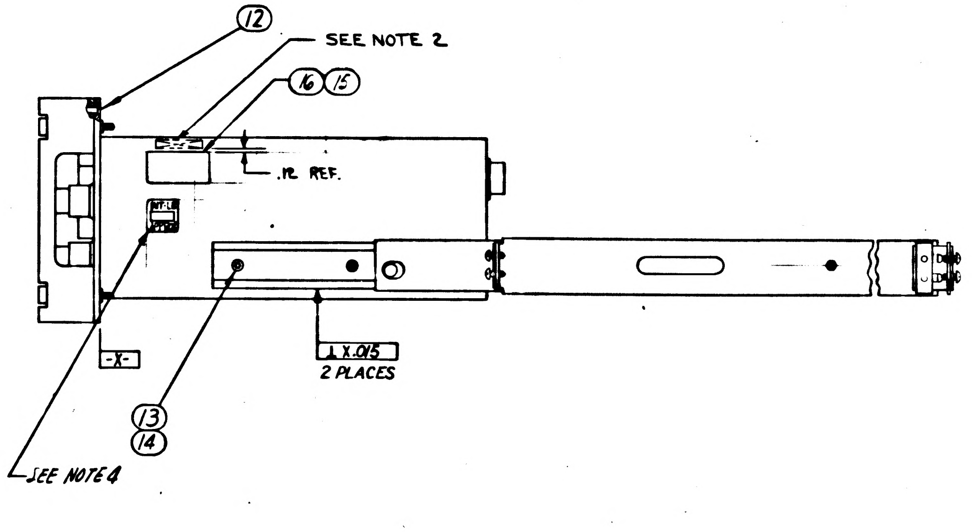
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		Replaces rev A COMPLETELY REVISED AND REDRAWN PER MXC186344	TDRR C1481	13 MAY 63	GCS ARS
C		CHANGE IN ACCORDANCE WITH XCM 199017		10 SEP 63	RW KRW
D		CHANGE IN ACCORDANCE WITH MXC 91407 PER TDRR 08207		29 OCT 63	J.J.J.
E		CHANGE IN ACCORDANCE WITH CM-94133 PER TDRR 08208	—	30 JAN 64	
F		CHANGE IN ACCORDANCE WITH CM-194647 PER TDRR 08209	—	5 FEB 64	MEM
G		CHANGE IN ACCORDANCE WITH CM 196207 ADDED CUSTOMER DATA (V2-64) REVISED PER TDRR 08210	—	13 APRIL 64	JB PJ

(M)

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV ___.) PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM (13) TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT PER ND 1002123 (23 LB)
5. SHIM TO FIT USING LAMINATED SHIM. 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023.
7. SECURE SCREWS USING ITEM (17).
8. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION
9. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 16 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
10. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 1481 DATE

(B) REPLACES REVISION A WITH CHANGE B

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 10				☒		18	PS1900036	PROCUREMENT SPECIFICATION
				AR		17	MIL-S-40083-CL30	SEALING COMPOUND (ES-2544-5)
SEE NOTE 9				1		16	1901304-118	NAMEPLATE
				4		15	AN535-00-4	(1897109-004) SCREW, DRIVE
SEE NOTE 11				6	✓	14	1016005-1	SHIM, LAMINATED
				6	✓	13	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
				8	✓	12	1015831-253	SCREW, FLAT HEAD, 90°, HEX SOCKET
SEE NOTE 8 & 11				4		10	1015790-002	NUT-BAR
SEE NOTE 8 & 11				2		9	1015789-001	BRACKET-ANGLE
				1		8	1901595-021	SLIDE-STATIONARY SECTION (L.H.)
				1		7	1901595-011	SLIDE-STATIONARY SECTION (R.H.)
SEE NOTE 11				1		6	1015788-002	SLIDE-INTERMEDIATE SECTION (L.H.)
				1		5	1015788-001	SLIDE-INTERMEDIATE SECTION (R.H.)
				1		4	1015786-002	SLIDE-FRONT SECTION (L.H.)
				1		3	1015786-001	SLIDE-FRONT SECTION (R.H.)
				2		2	1900015-041	HANDLE ASSEMBLY
				1		1	1900050-011	VOLTMETER-PHASE ANGLE

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44299
DRAWN E. LITZOW 4 APR 63
DATE
MALEKOWSKI 12 APR 63
CHECKED
GEORGE J. PESKURA
APPROVAL
A.J. MODEL 12 APR 63
APPROVAL
NASA APPROVAL
Bearman 4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, PHASE ANGLE ASSEMBLY

CODE IDENT NO.
SIZE E
1900036
SCALE 1:2
SHEET 1

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		Replaces Rev A COMPLETELY REVISED AND REDRAWN PER MXC186344	TDRR C1481	13 MAY 63	GGS ARS
C		CHANGE IN ACCORDANCE WITH XCM 189017		10 SEP 63	RW RW
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 08207		29 OCT 63	J.J.J. PJ
E		CHANGE IN ACCORDANCE WITH CM-194133 PER TDRR 08208	—	30 JAN 64	
F		CHANGE IN ACCORDANCE WITH CM-194647 PER TDRR 08209	—	5 FEB 64	MEM
G		CHANGE IN ACCORDANCE WITH CM-196207 ADDED CUSTOMER DATA (V2-64) REVISED PER TDR R 08210	—	13 APRIL 64	JB PJ
H		REVISED PER TDRR 10873	—	17 JUL 64	R.F.

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV ___) PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑬ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT PER ND 1002123 (23 LB)
5. SHIM TO FIT USING LAMINATED SHIM. 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023.
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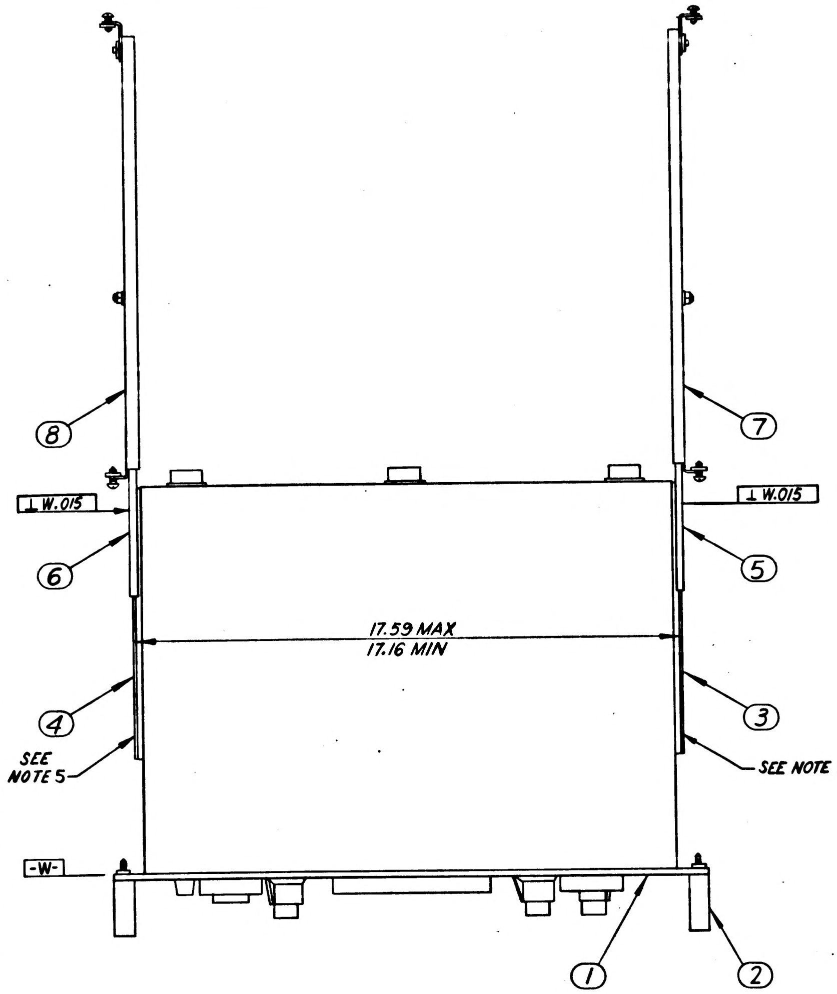
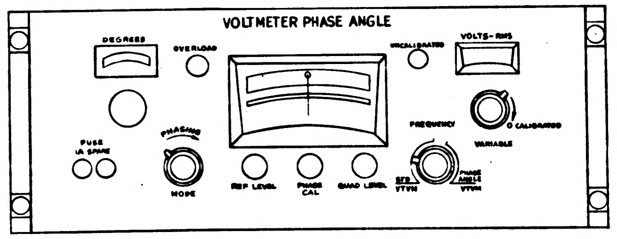
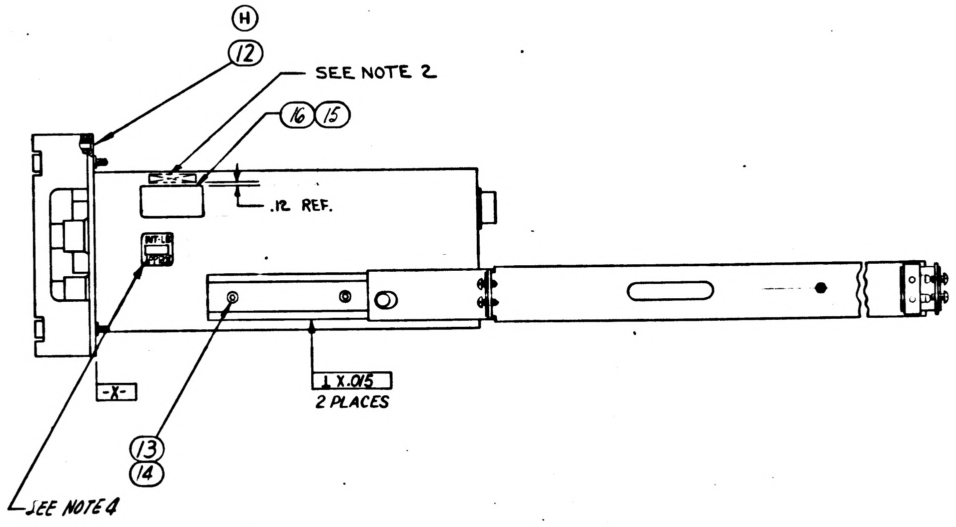
11. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 1481 **DATE**

Ⓑ REPLACES REVISION A WITH CHANGE B

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 10				☒		18	PS1900036	PROCUREMENT SPECIFICATION
				AR		17	MIL-S-40083-CL30	SEALING COMPOUND (ES-2544-5)
SEE NOTE 9				1		16	1901304-118	NAMEPLATE
				4		15	AN535-00-4	(1897109-004) SCREW, DRIVE
SEE NOTE 11				6		14	1016005-1	SHIM, LAMINATED
SEE NOTE 11				6		13	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
SEE NOTE 11				8		12	AN507C832R12	(1897003-568) SCREW, FLAT HD, 100°
SEE NOTE 8 & 11				4		10	1015790-002	NUT-BAR
SEE NOTE 8 & 11				2		9	1015789-001	BRACKET-ANGLE
				1		8	1901595-021	SLIDE-STATIONARY SECTION (L.H.)
				1		7	1901595-011	SLIDE-STATIONARY SECTION (R.H.)
SEE NOTE 11				1		6	1015788-002	SLIDE-INTERMEDIATE SECTION (L.H.)
SEE NOTE 11				1		5	1015788-001	SLIDE-INTERMEDIATE SECTION (R.H.)
SEE NOTE 11				1		4	1015786-002	SLIDE-FRONT SECTION (L.H.)
SEE NOTE 11				1		3	1015786-001	SLIDE-FRONT SECTION (R.H.)
				2		2	1900015-041	HANDLE ASSEMBLY
				1		1	1900050-011	VOLTMETER-PHASE ANGLE

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL ———
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44299
DRAWN E. LITZOW DATE 4 APR 63
MALEKOWSKI 12 APR 63
CHECKED
GEORGE J. PESKWRIG
APPROVAL
A. J. KODEL 12 APR 63
APPROVAL
NASA APPROVAL 4/4/63
L. Geiman 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, PHASE ANGLE
ASSEMBLY

CODE IDENT NO. SIZE E 1900036
SCALE 1:2 SHEET 1

1900036

1900036

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 **DATE** 24 Apr 63

						TO BE ASSIGNED	SLIDES
			2			1900015-041	HANDLES
			1			1900050-011	VOLTMETER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
− — − — − —
DO NOT SCALE THIS DRAWING
MATERIAL ——
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44299
DRAWN E. LITZOW DATE 4-4-63
CHECKED 4-12-63
APPROVAL GEORGE J. PESKURIC 4-12-63
APPROVAL 12 APR 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER-PHASE ANGLE
ASSEMBLY

CODE IDENT NO.
SIZE C
1900036
SCALE ——
SHEET

MIL 1078C-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900037

(M)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC 186345	TDRR 01485	16 MAY 63 5 Jul 63	WL WL.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63.

(A) REPLACED WITH CHANGE BY REVISION B

						TO BE ASSIGNED	SLIDES
			2			1900015-081	HANDLES
			1			1900026-011	OSCILLOSCOPE
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± —— ± —— ± ——
DO NOT SCALE THIS DRAWING
MATERIAL ——
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44254
DRAWN E. LITZOW DATE 4-4-63
Malikowski 10 APR 63
CHECKED
APPROVAL R. Korden 4/10
APPROVAL A. Rodel 10 APR 63
NASA APPROVAL K. Michel 4/24/63
J. P. Seemore 4-24-63
MIT APPROVAL W. Copp 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, DUAL BEAM
ASSEMBLY

CODE IDENT NO.
SIZE C
1900037
SCALE ——
SHEET

MIL 1078C—P

SK44254

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

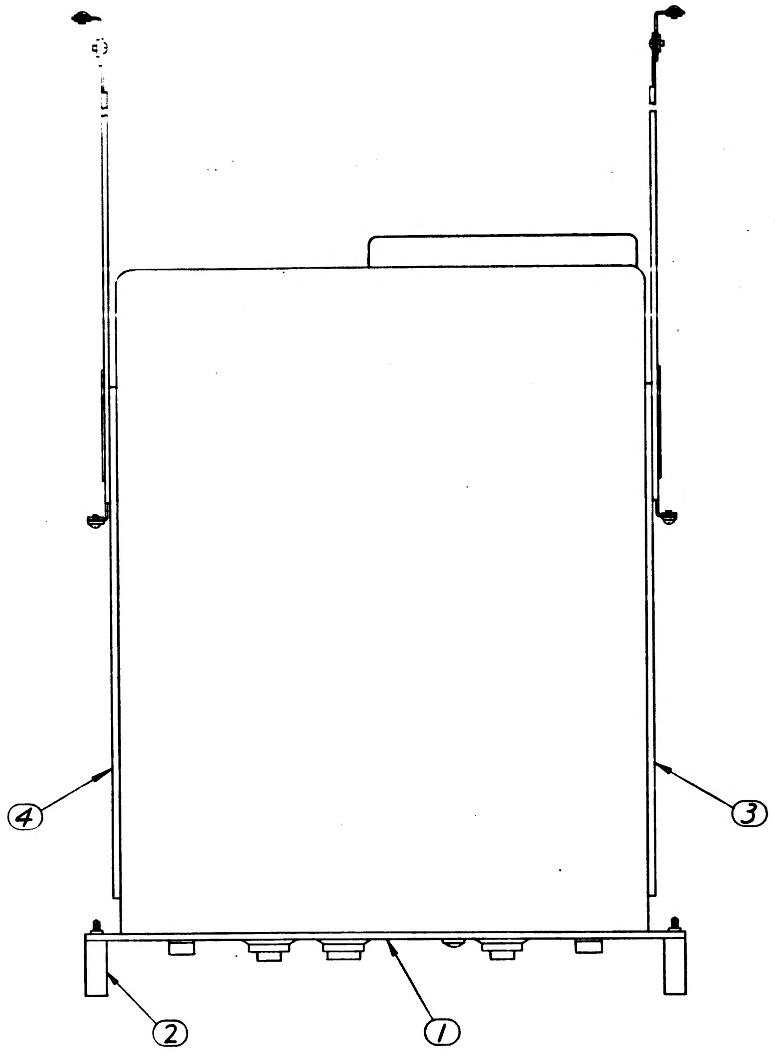
1900037

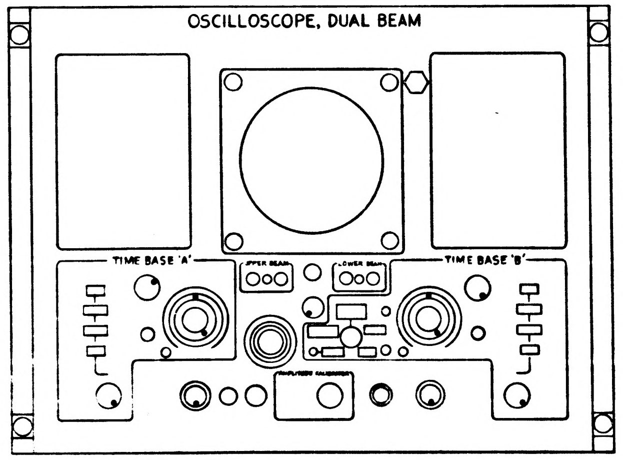
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		Replaces Rev A COMPLETELY REVISED AND REDRAWN PER MXC 186345	~~542~~ 01485	8 MAY 63	

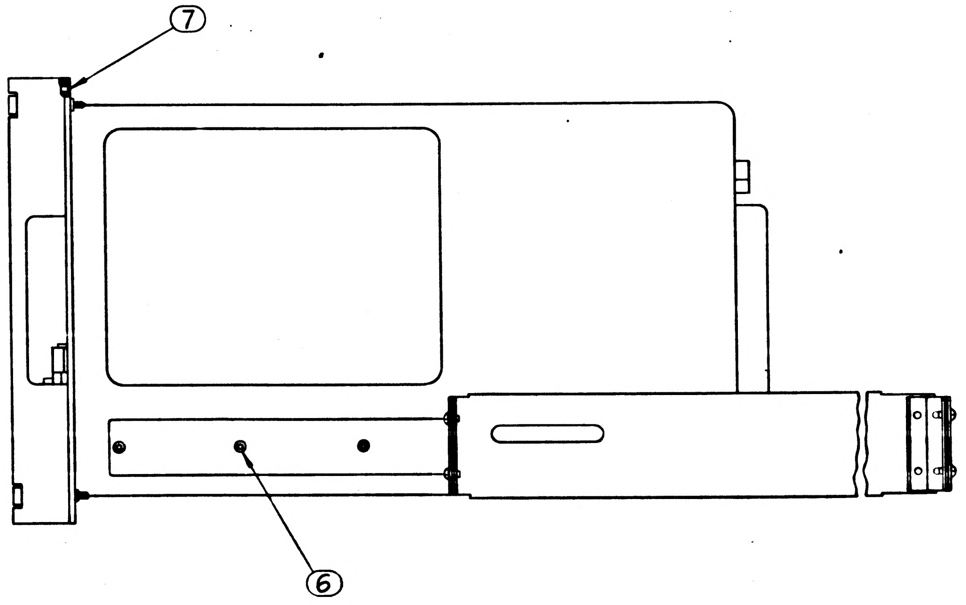
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267)

TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01485 DATE 5 Jun 63

Ⓑ REPLACES REVISION A WITH CHANGE B

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			8		7	1015831-257	SCREW, F.H. 100° HEX SOCKET
			10		6	1015826-296	SCREW, F.H. HEX. SOCKET
			1		5		NAMEPLATE
			1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE
			1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE
			2		2	1900015-081	HANDLE ASSEMBLY
			1		1	1900026-011	OSCILLOSCOPE, DUAL BEAM

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44254
DRAWN 4 APR 63 DATE 8 APR 63
CHECKED
APPROVAL R Korda 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL
6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

OSCILLOSCOPE, DUAL BEAM
ASSEMBLY

CODE IDENT NO.
SIZE E
1900037
SCALE 1:2
SHEET 1

1900037 B

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

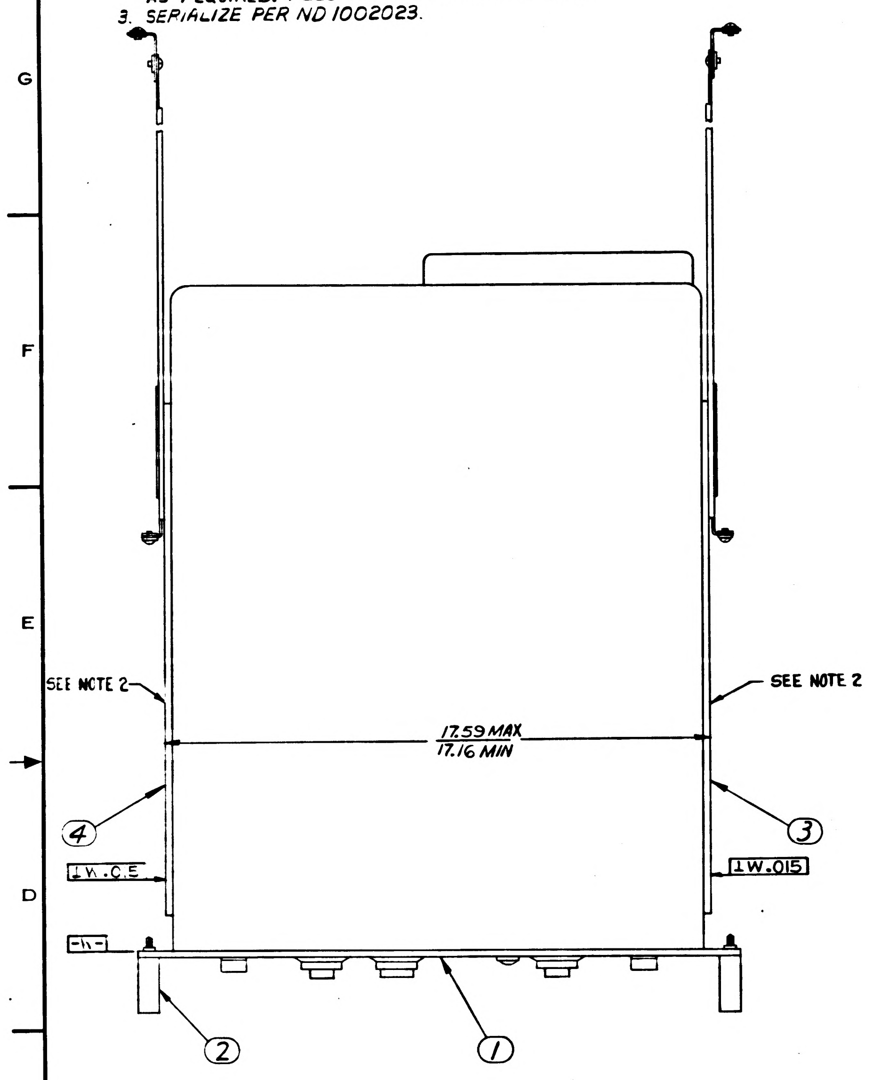
IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267)

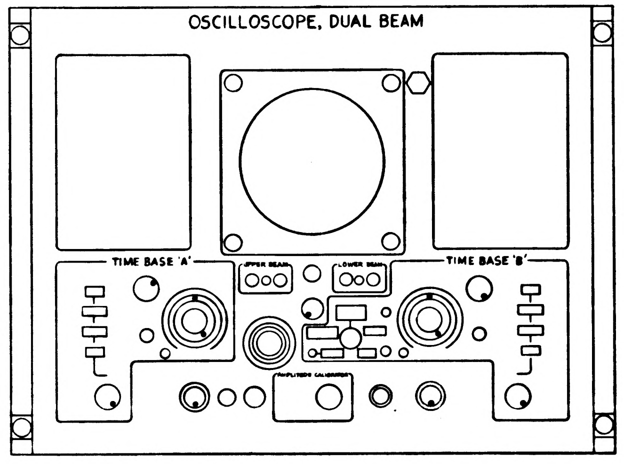
TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.

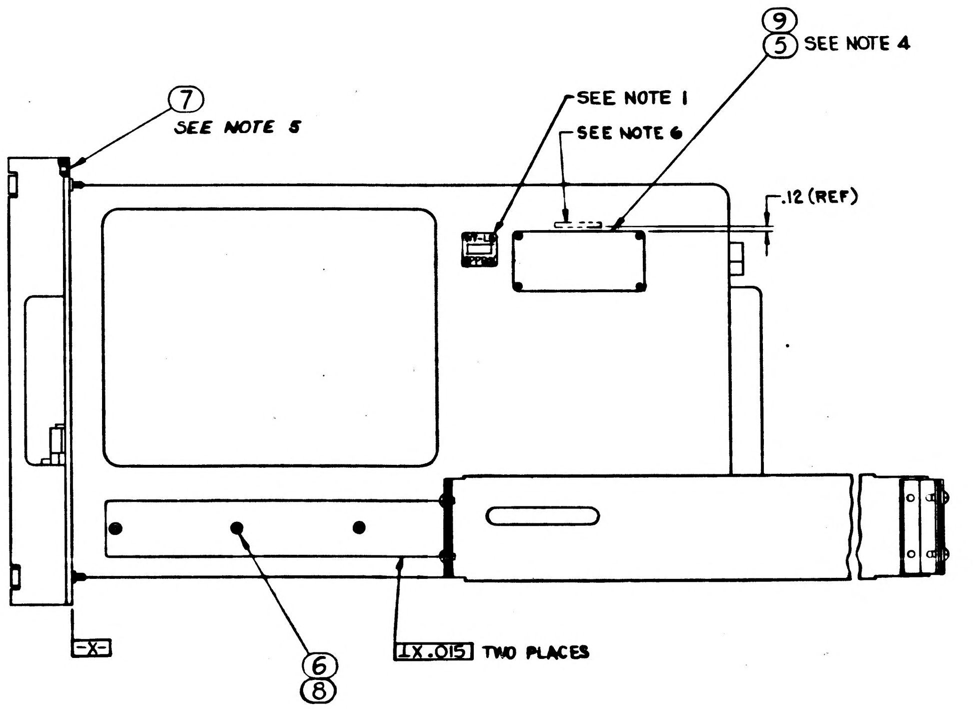
1. MARK WEIGHT PER ND 1002123 (77 LB).
2. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
3. SERIALIZE PER ND 1002023.
4. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM ⑤ IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
5. SECURE SCREWS USING ITEM ⑩.
6. MARK APPLICABLE REVISION LETTER (REV__) PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
7. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		Replaces Rev A COMPLETELY REVISED AND REDRAWN PER MXC 186345	TDRR 01455	8 MAY 63	GCS
C		CHANGE IN ACCORDANCE WITH MXC 8908		5 SEP 63	
D		CHANGE IN ACCORDANCE WITH MXC 9140		29 OCT 63	
E		CHANGE IN ACCORDANCE WITH CM 192884 PER TDRR 20083		10 DEC 63	
F		CHANGE IN ACCORDANCE WITH CM 194134 PER TDRR 28184		10 JAN 64	RJF
G		CHANGE IN ACCORDANCE WITH CM 196020 PER TDRR 28185		17 MAR 64	MEM







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01455 DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

SEE NOTE 7

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		11	PS1900037	PROCUREMENT SPECIFICATION
			AR		10	MIL-S-40038-C130	(ES-2544-5) SEALING COMPOUND
			4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
			10		8	1016005-1	SHIM, LAMINATED
			8		7	1015831-253	SCREW, F.H. 100° HEX SOCKET
			10		6	1015826-300	SCREW, F.H. HEX. SOCKET
			1		5	1901304-113	NAMEPLATE
			1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE
			1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE R
			2		2	1900015-081	HANDLE ASSEMBLY
			1		1	1900026-011	OSCILLOSCOPE, DUAL BEAM
			011				

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44254
DRAWN E. Litzow DATE 4 APR 63
Mike Kowalski 8 APR 63
CHECKED
APPROVAL R. Kordes 10 APR 63
APPROVAL A. Rodel 10 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, DUAL BEAM
ASSEMBLY

CODE IDENT NO.
SIZE E
1900037
SCALE 1:2
SHEET 1

4 1900037 3 2 1

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

D

C

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24Apr63

B

1900037

							TO BE ASSIGNED	SLIDES
				2			1900015-081	HANDLES
				1			1900026-011	OSCILLOSCOPE
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS		

A

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± —— ± —— ± ——
DO NOT SCALE THIS DRAWING
MATERIAL ——
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44254
DRAWN E. LITZOW DATE 4-4-63
Kaurke 10APR63
CHECKED
APPROVAL R. Kordes 4/10
APPROVAL A. Fodel 10 APR 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL 24Apr63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, DUAL BEAM
ASSEMBLY

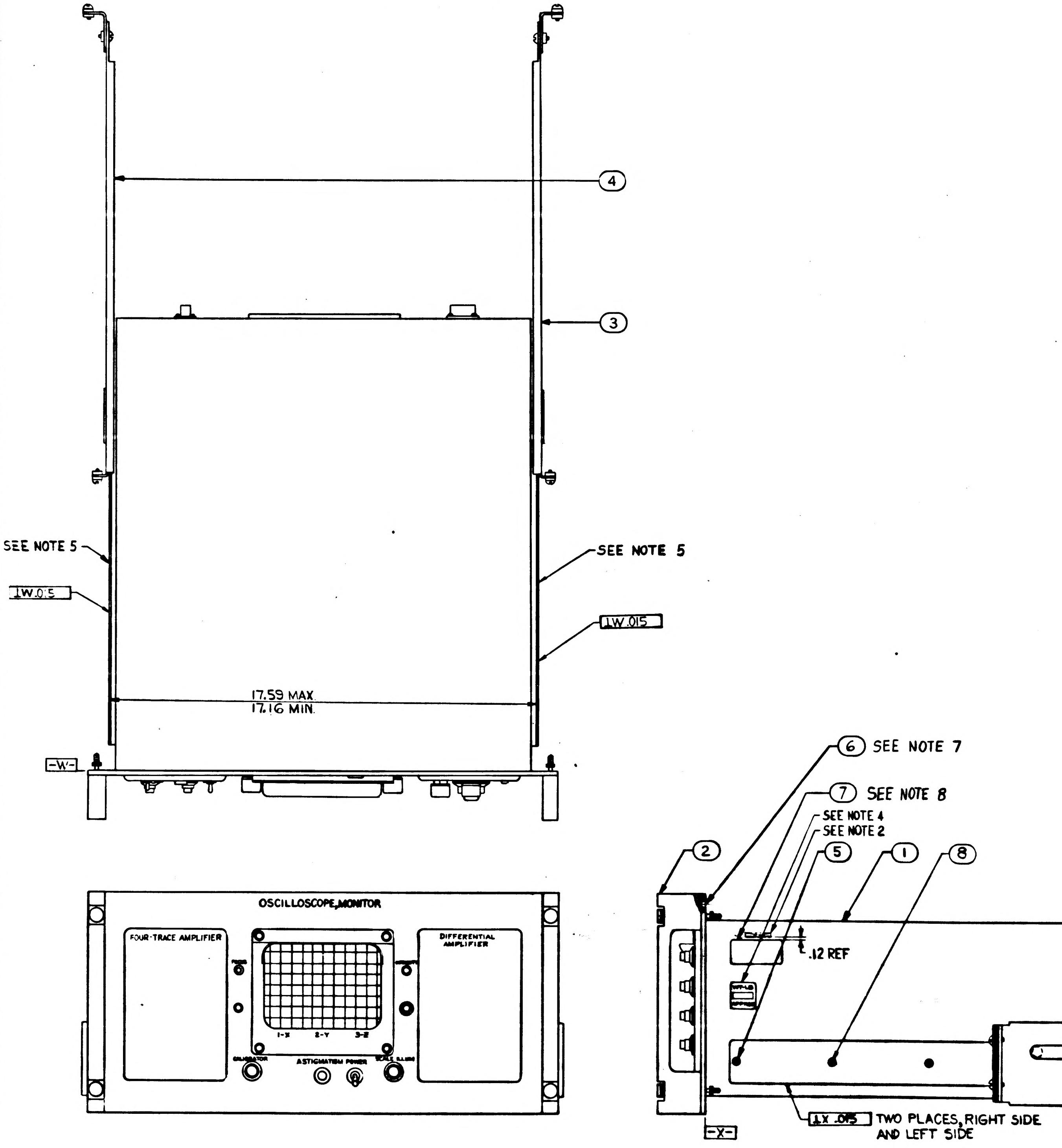
CODE IDENT NO. SIZE C 1900037
SCALE —— SHEET

MIL 1078C—P 4 3 2 SK44254 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MARK APPLICABLE REVISION LETTER (REV) PER ND1002019 .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.
3. TORQUE ITEM ⑤ TO 37-40 INCH POUNDS AT INSTALLATION
4. MARK WEIGHT PER ND1002123 (41 LB)
5. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023.
7. SECURE SCREWS USING ITEM ⑪.
8. *MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER TO ITEM ⑦ IN ACCORDANCE WITH ND1002023 LETTERS AND NUMERALS ARE TO BE .06 HIGH.*
9. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186346	~~TDRR~~	9 MAY 63	VARS
		Replaced Rev A	01476		WR
C		CHANGE IN ACCORDANCE WITH MXC 189019		5 SEPT 63	
D		CHANGE IN ACCORDANCE WITH MXC 191407		29 OCT 63	
E	C-5	ITEMS 6 & 5 WERE 5 & 6. ITEM 5 P/N WAS 1015826-296 PER MXC 191766 PER TDRR		13 NOV 63	YHS
F		CHANGE IN ACCORDANCE WITH CM 194135 PER TDRR 08216		3 FEB 64	
G		CHANGE IN ACCORDANCE WITH CM 194550 PER TDRR 08217		9 FEB 64	
H		CHANGE IN ACCORDANCE WITH CM 196126		18 MAR 64	MEM
J		CHANGE IN ACCORDANCE WITH CM 196489 PER TDRR 08218		APR 64	



FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01476 DATE

Ⓑ REPLACES REVISION A WITH CHANGE.

SEE NOTE 9

			☒		12	PS1900038	PROCUREMENT SPECIFICATION
			AR		11	MIL-S-40083-C130	(ES2544-5) SEALING COMPOUND
			4		10	AN535-00-4	(1897109-004) SCREW, DRIVE
			8		8	1016005-1	SHIM, LAMINATED
			1		7	1901304-106	NAME PLATE
			8		6	1015831-253	SCREW, FH 100°, HEX SOCKET
			10		5	1015826-304	SCREW, FH HEX SOCKET
			1		4	1015791-010	SLIDE ASSEMBLY, QUICK RELEASE
			1		3	1015791-009	SLIDE ASSEMBLY, QUICK RELEASE
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900024-011	OSCILLOSCOPE, MONITOR
			ON	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44287-A
DRAWN DATE 4 APR 63
CHECKED 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR
ASSEMBLY

CODE IDENT NO.
SIZE E
1900038
SCALE 1:2
SHEET 1 OF 1

J
1900038

1900038

(M)

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC 186346.	TDRR 01476	16 MAY 63	W S
				6 June 63	WR

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 APR63

Ⓐ REPLACED WITH CHANGE BY REVISION B

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						TO BE ASSIGNED	SLIDES
			2			1900015-051	HANDLES
			1			1900024-011	OSCILLOSCOPE

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44287

DRAWN E. LITZOW DATE 4-4-63
10 APR 63
CHECKED
APPROVAL R. Kardes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR
ASSEMBLY

CODE IDENT NO.
SIZE C
1900038
SCALE
SHEET

MIL 1078C—P

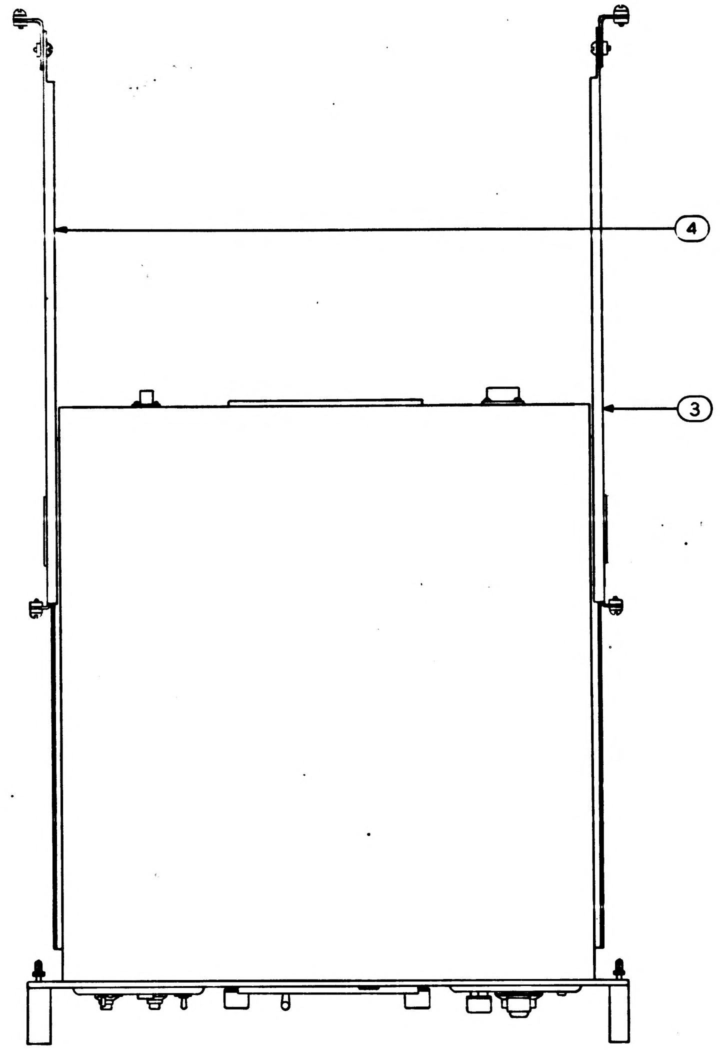
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

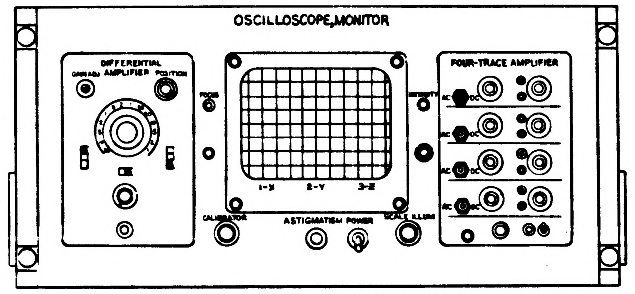
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

IDENTIFY USING DRAWING AND REVISION LETTER PER MIL-STD-130 (E3-267)

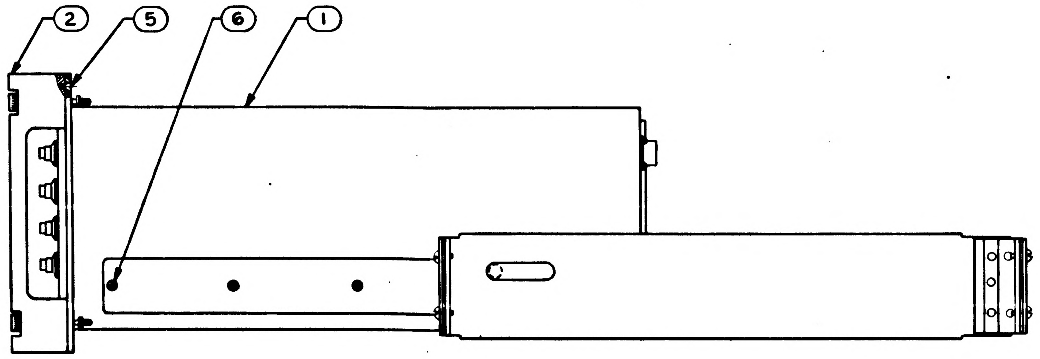
TORQUE ITEM ⑤ TO 37-40 INCH POUNDS AT INSTALLATION

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186346	~~SRX~~	9 MAY 63	
		Torqueland Rev A			





OSCILLOSCOPE,MONITOR
DIFFERENTIAL AMPLIFIER
GAIN ADJ
POSITION
FOCUS
INTENSITY
1-X
2-Y
3-Z
FOUR-TRACE AMPLIFIER
AC
DC
CALIBRATOR
ASTIGMATISM
POWER
SCALE ILLUM



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 10476 DATE

Ⓑ REPLACES REVISION A WITH CHANGE B

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1		7		NAME PLATE
			8		6	1015831-257	SCREW, FH, 100, HEX SOCKET
			10		5	1015826-296	SCREW, FH HEX SOCKET
			1		4	1015791-010	SLIDE ASSEMBLY, QUICK RELEASE L.H.
			1		3	1015791-009	SLIDE ASSEMBLY, QUICK RELEASE R.H.
			2		2	900015-051	HANDLE ASSEMBLY
			1		1	900024-011	OSCILLOSCOPE, MONITOR

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44287-A
DRAWN E. Litzow DATE 4-APR63
CHECKED 10-APR63
APPROVAL R. Korder 10APR63
APPROVAL 10APR63
NASA APPROVAL
L. Gedman 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR ASSEMBLY

CODE IDENT NO
SIZE E
1900038
SCALE 1:2
SHEET 1

1900038 B

INCHES
PHOTOGRAPHIC SCALE ONLY

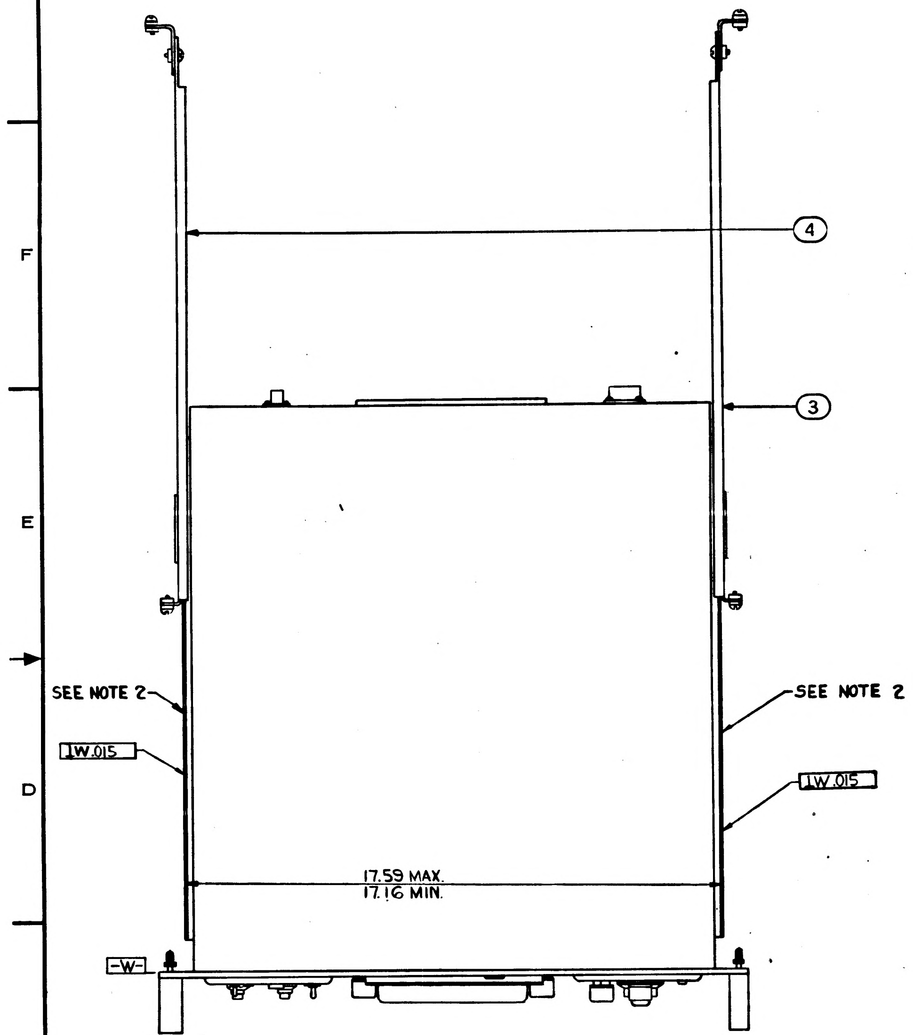
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

IDENTIFY USING DRAWING AND REVISION LETTER PER MIL-STD-130 (*ES-267*)

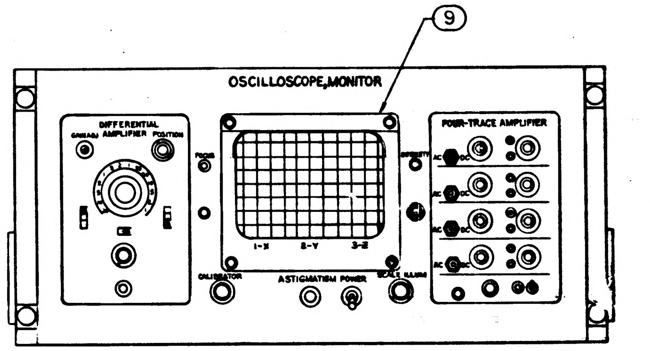
TORQUE ITEM ⑤ TO 37-40 INCH POUNDS AT INSTALLATION

1. MARK WEIGHT PER ND1002123 (41LB)
2. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
3. SERIALIZE PER ND 1002023.

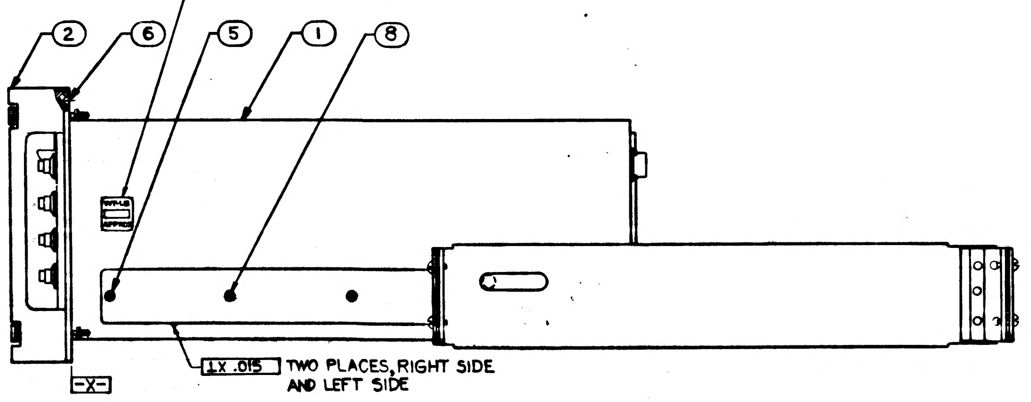
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		COMPLETELY REVISED AND REDRAWN PER MXC 186346	~~TDRR~~	9 MAY 63	
		Complete Rev A	01476		
C		CHANGE IN ACCORDANCE WITH MXC 189019		5 SEPT 63	
D		CHANGE IN ACCORDANCE WITH MXC 191407		29 OCT 63	J.J.J.
E	C-5	ITEMS 6&5 WERE 5&6. ITEM 5 P/N WAS 1015826-296 PER MXC 191766 PER TDRR [illegible]		13 NOV 63	



4
3
SEE NOTE 2
1W.015
SEE NOTE 2
1W.015
17.59 MAX.
17.16 MIN.
-W-



9
OSCILLOSCOPE, MONITOR
DIFFERENTIAL AMPLIFIER
FOUR-TRACE AMPLIFIER
CALIBRATOR
ASTIGMATISM
POWER



SEE NOTE 1
2
6
5
1
8
1X.015 TWO PLACES, RIGHT SIDE AND LEFT SIDE
-X-

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01476 **DATE**

Ⓑ REPLACES REVISION A WITH CHANGE B

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			4		10	AN535-00-4	(1897109-004) SCREW, DRIVE
			1		9	1900177	SHADE, OSCILLOSCOPE
			8		8	1016005-1	SHIM, LAMINATED
			1		7	1900704	NAME PLATE
			8		6	1015831-257	SCREW, FH 100, HEX SOCKET
			10		5	1015826-304	SCREW, FH HEX SOCKET
			1		4	1015791-010	SLIDE ASSEMBLY, QUICK RELEASE L.H
			1		3	1015791-009	SLIDE ASSEMBLY, QUICK RELEASE R.H.
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900024-011	OSCILLOSCOPE, MONITOR
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK-44287-A
DRAWN E. Litzow DATE 4-APR63
CHECKED Mole Rosnik 10-APR63
APPROVAL R Korder 10APR63
APPROVAL W J Kodel 10APR63
NASA APPROVAL
L. Gohmann 6-4-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR
ASSEMBLY

CODE IDENT NO.
SIZE E
1900038
SCALE 1:2
SHEET 1

1900038

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE**

						TO BE ASSIGNED	SLIDES
			2			1900015-051	HANDLES
			1			1900024-011	OSCILLOSCOPE
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — DECIMALS + — — ANGLES + — —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44287
DRAWN E. LITZOW DATE 4-4-63
CHECKED 10 APR 63
APPROVAL R. Kardes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J. P. Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOSCOPE, MONITOR
ASSEMBLY

CODE IDENT NO.
SIZE C
1900038
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

(M)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC186347	TDRR 01475	10 MAY 63	JEL
				5 Jun 63	WK

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

Ⓐ REPLACED WITH CHANGE BY REVISION B

						TO BE ASSIGNED	SLIDES
			2			1900015-041	HANDLES
			1			1900020-011	COUNTER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —

DO NOT SCALE THIS DRAWING

MATERIAL ———

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK 44440

DRAWN E. LITZOW DATE 4-4-63
10 APR 63
CHECKED
APPROVAL R. Kordes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
JP Acmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, COUNTER, REMOTE
ASSEMBLY

CODE IDENT NO. SIZE C 1900039

SCALE ——— SHEET

MIL 1078C—P

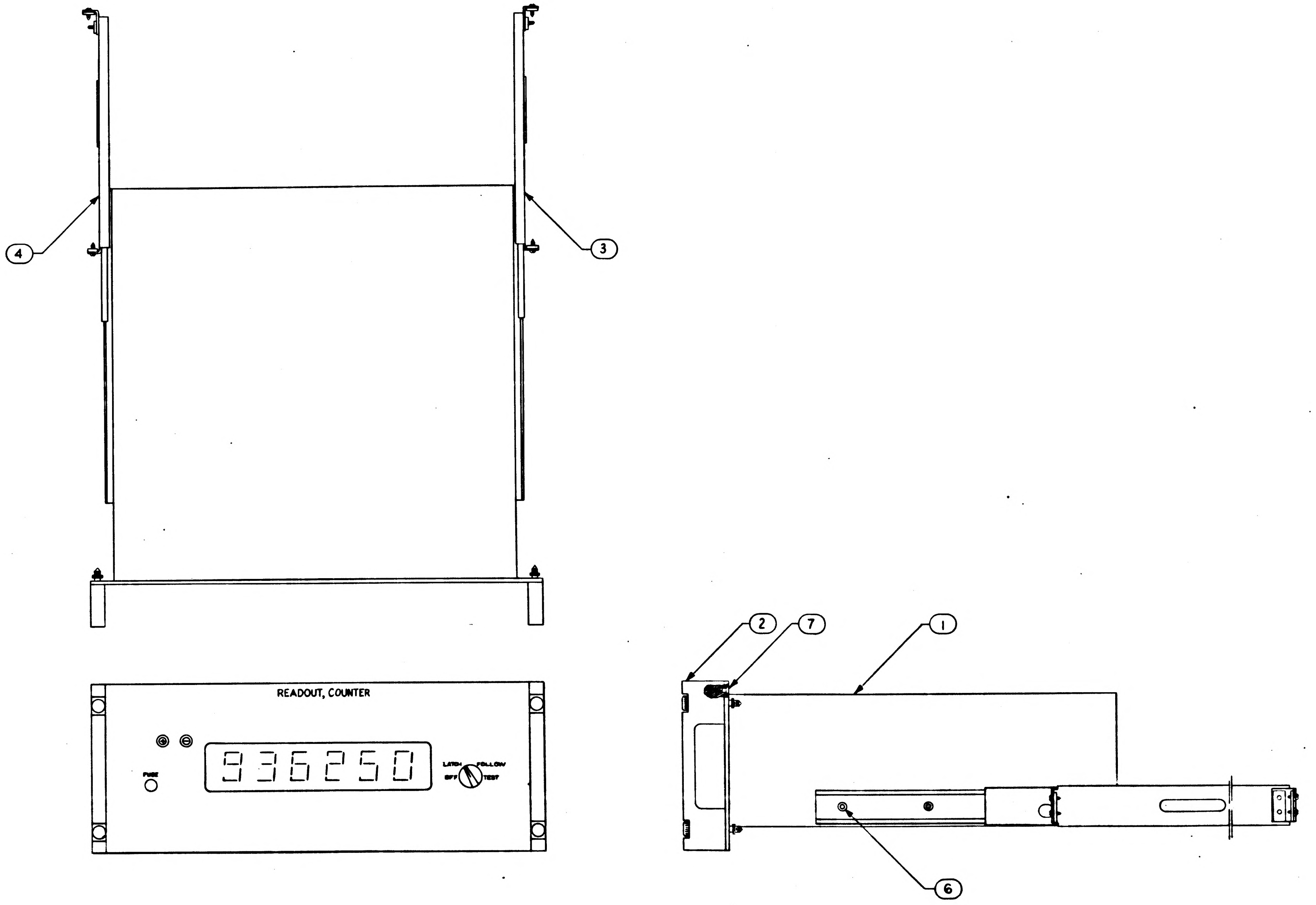
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186347	TDR C1475	2-MAY 63 5 June	

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267)

TORQUE ITEM ⑥ TO 37-40 INCH-POUNDS AT INSTALLATION.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1475 DATE 5 June 1963

Ⓑ REPLACES REVISION A WITH CHANGE B

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			8		7	015831-257	SCREW-FLAT HEAD, 100°, HEX SOCKET
			8		6	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			1		5		NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE L H
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE R H
			2		2	1900015-041	HANDLE ASSEMBLY
			1		1	1900020-011	READOUT, COUNTER

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK4440

DRAWN E. LITZOW DATE 4APR63
MALEKOWSKI 10APR63
CHECKED R KORDES 10APR63
APPROVAL A.J. KODEL 10APR63
APPROVAL

NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, COUNTER, REMOTE ASSEMBLY

CODE IDENT NO
SIZE E
1900039
SCALE —
SHEET

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267)

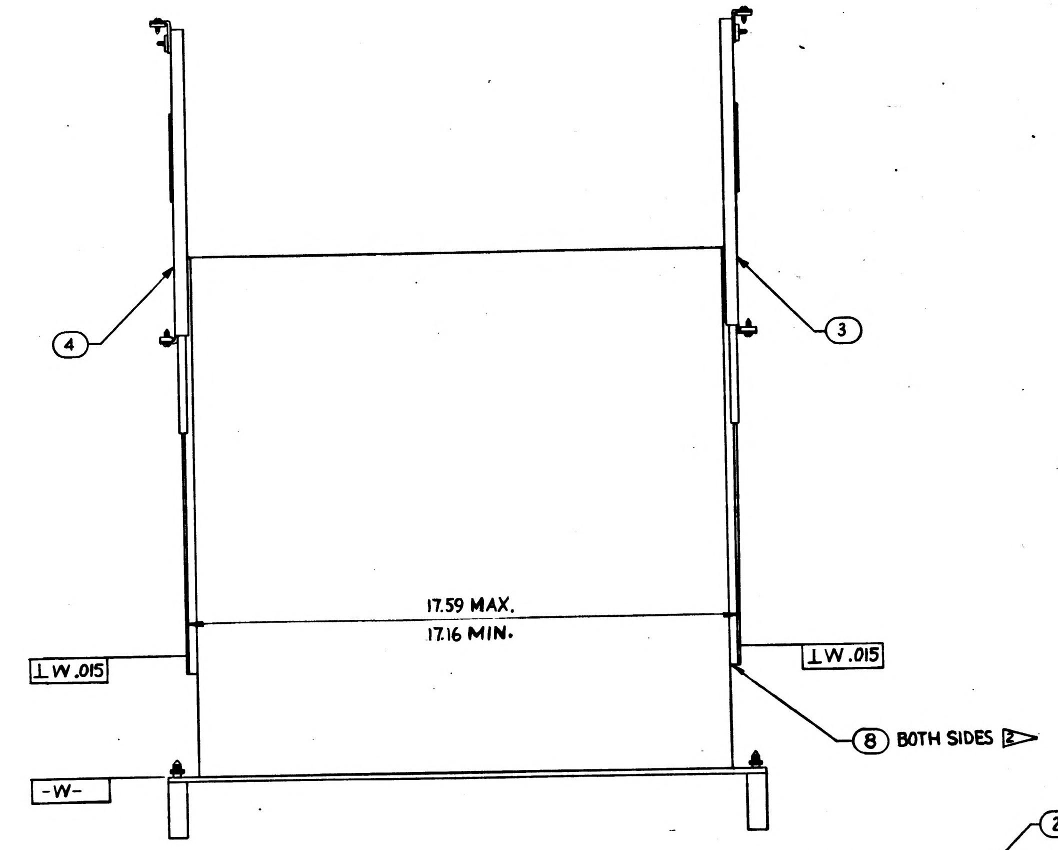
TORQUE ITEM ⑥ TO 37-40 INCH-POUNDS AT INSTALLATION.

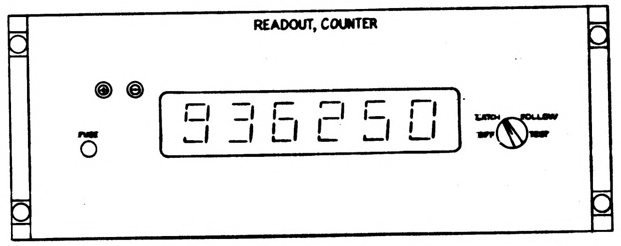
2 ▷ SHIM TO FIT, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIMS.

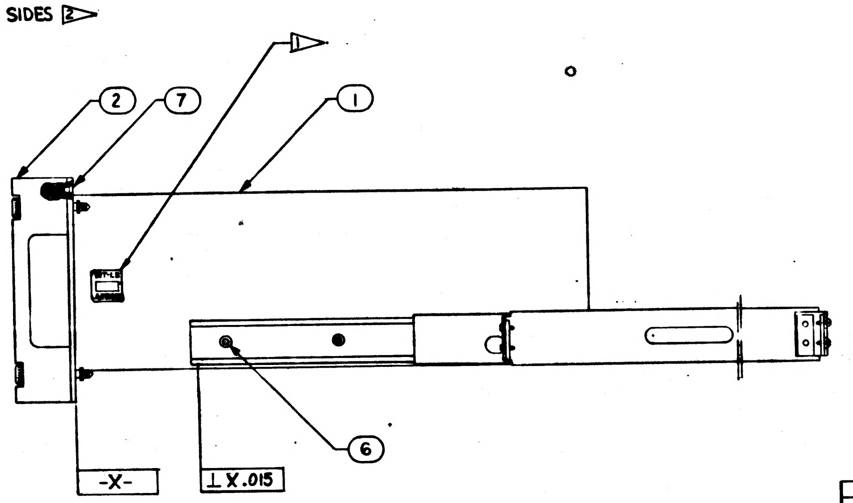
1 ▷ MARK WEIGHT PER MD 1002123 (25 LB)
SERIALIZE PER ND 1002023.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186347	TDRR	2-MAY 63	ARS
C		CHANGE IN ACCORDANCE WITH MXC 188272		29 JUL 63	C.A.M.
D		CHANGE IN ACCORDANCE WITH MXC 191407		29 OCT 63	J.J.J.
		PER TDRR 04877		[illegible]	







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01475 **DATE** 5 June 1963

Ⓑ REPLACES REVISION A
WITH CHANGE B

1900039

			4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
			10		8	1016005-1	SHIM, LAMINATED
			8		7	1015831-257	SCREW-FLAT HEAD, 100°, HEX SOCKET
			8		6	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			1		5	1900704	NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE L-H
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE R-H
			2		2	1900015-041	HANDLE ASSEMBLY
			1		1	1900020-011	READOUT, COUNTER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK4440
DRAWN E. LITZOW DATE 4APR63
MALEKOWSKI 10APR63
CHECKED
R KORDES 10APR63
APPROVAL
A.J. KODEL 10APR63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

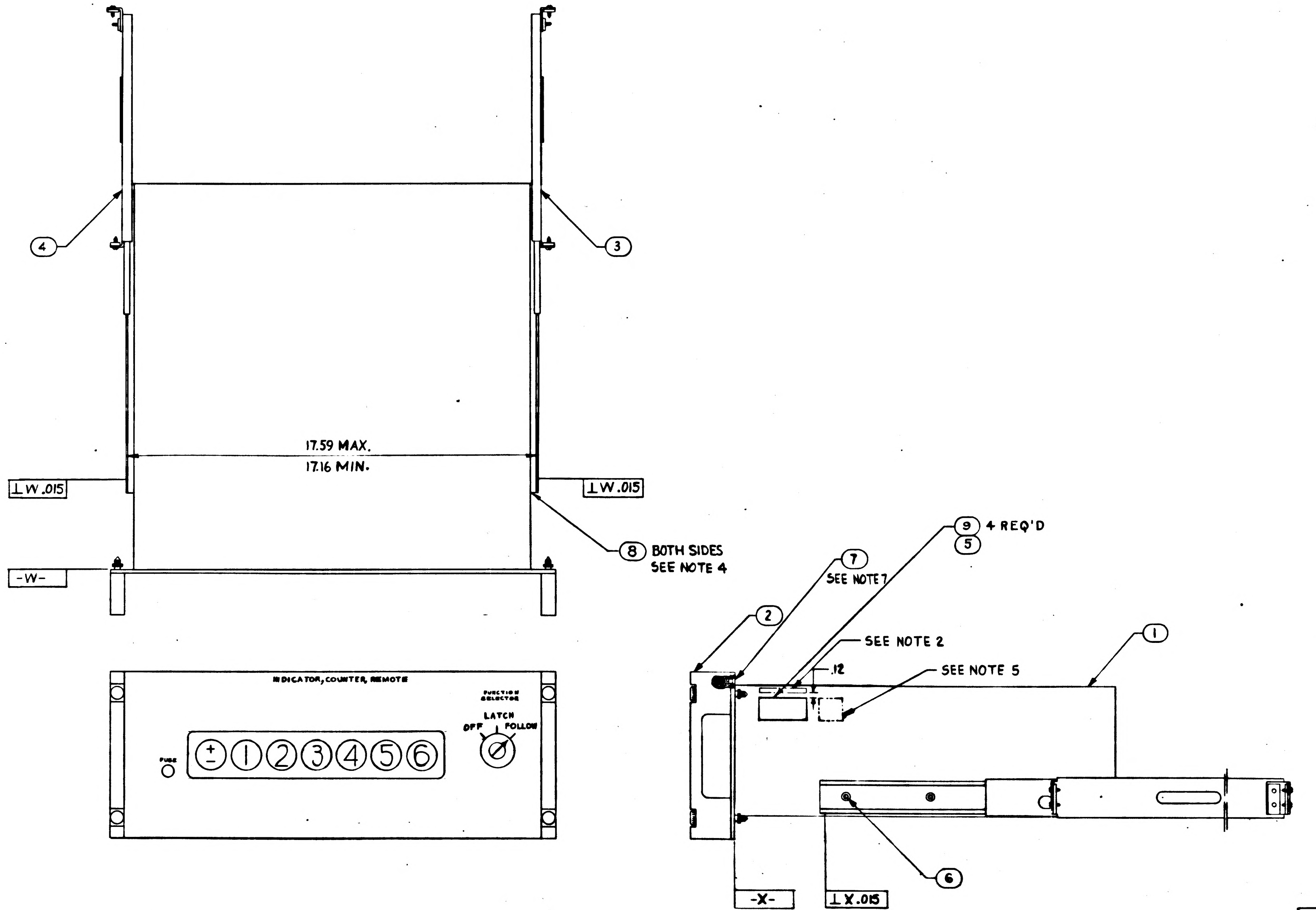
INDICATOR, COUNTER, REMOTE
ASSEMBLY

CODE IDENT NO. SIZE E 1900039
SCALE — SHEET 1

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV .) PER ND 1002019, .12 HIGH COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑥ TO 37-40 INCH-POUNDS AT INSTALLATION.
4. SHIM TO FIT, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIMS.
5. MARK WEIGHT PER ND 1002123 (25 LB) SERIALIZE PER ND 1002023.
6. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 5 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
7. SECURE SCREWS USING ITEM ⑩
8. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MIC 186347		10-[illegible] 63	ARS
C		CHANGE IN ACCORDANCE WITH MXC 88272		29 JUL 63	C.A.M. EF
D		CHANGE IN ACCORDANCE WITH MIC 91407 PER TDRR 04877		29 OCT 63 2 NOV 63	J.J.J.
E		CHANGE IN ACCORDANCE WITH CM 193209 PER TDRR 08160		3 JAN 64	JE
F		ADDED FLAG NOTE 4, ITEM 7 P/N WAS 1015831-25, ADDED ITEM 10 & ASSOC. INFO. PER CM 194136 PER TDRR 08107		22 JAN 64	
G		CHANGE IN ACCORDANCE WITH CM 196459 PER TDRR 08168	—	1 APR 64	FK



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01475 DATE, 5 June 1963

Ⓑ REPLACES REVISION A WITH CHANGE B

SEE NOTE 8

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		11	PS-1900039	PROCUREMENT SPECIFICATION
			AR		10	MIL-S-40083-C130	(ES 2544-5) SEALING COMPOUND
			4		9	AN535-00-4	(897109-004) SCREW, DRIVE
			10		8	1016005-1	SHIM, LAMINATED
			8		7	1015831-253	SCREW-FLAT HEAD, 100°, HEX SOCKET
			8		6	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			1		5	901304-125	NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE L H
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE R H
			2		2	1900015-041	HANDLE ASSEMBLY
			1		1	1900020-011	READOUT, COUNTER
			ON	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900000	1900000
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK4440
DRAWN E. LITZOW DATE [illegible]
MALE KOWSKI 10 APR 63
CHECKED
R KORDES 10APR63
APPROVAL
A.J. KODEL 10APR63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, COUNTER, REMOTE
ASSEMBLY

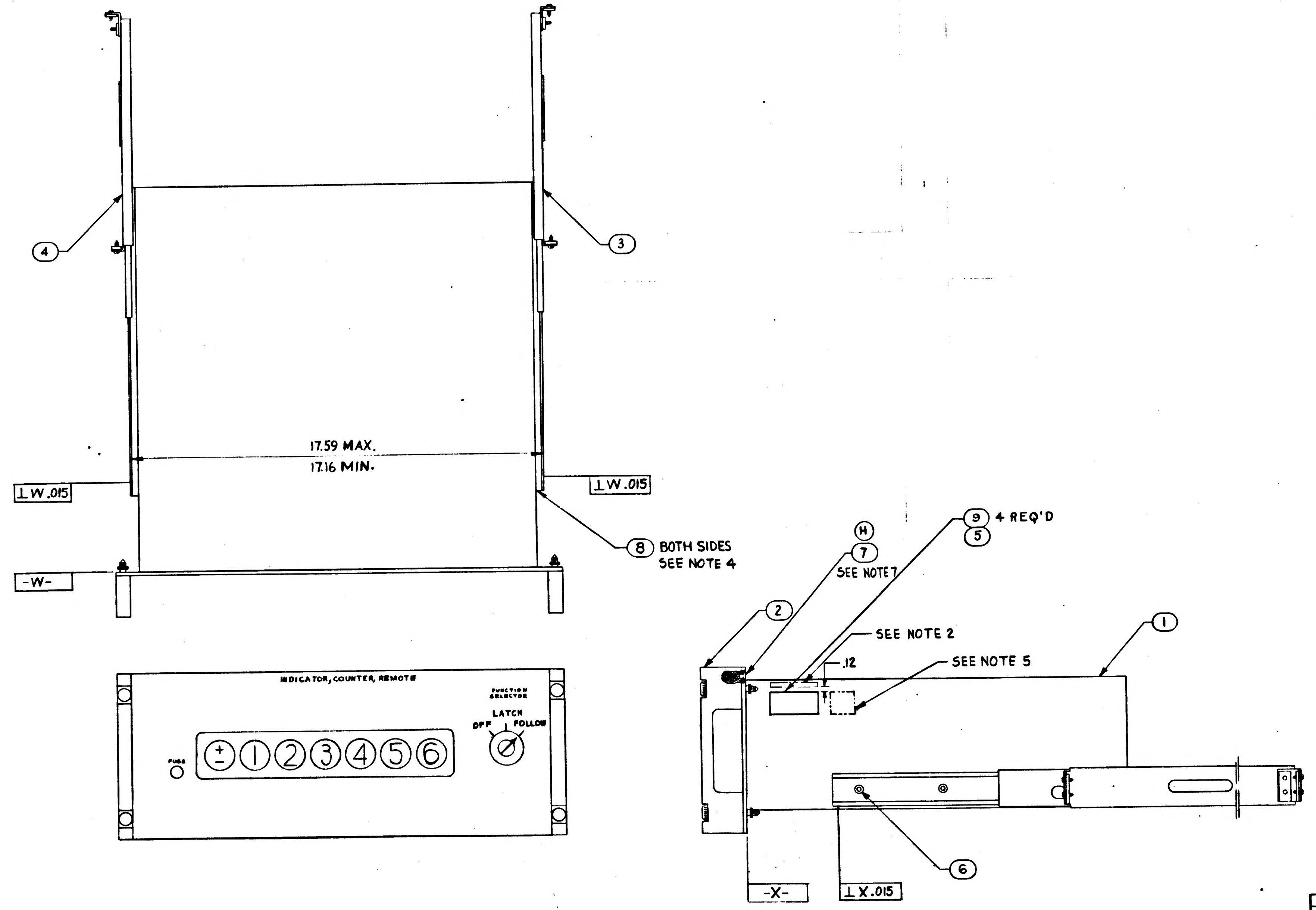
CODE IDENT NO.
SIZE E
1900039
SCALE —
SHEET 1 OF

G
1900039
B

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK APPLICABLE REVISION LETTER (REV .) PER ND 1002019, .12 HIGH COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑥ TO 37-40 INCH-POUNDS AT INSTALLATION.
4. SHIM TO FIT, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIMS.
5. MARK WEIGHT PER N D 1002123 (25 LB)
SERIALIZE PER ND 1002023.
6. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 5 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
7. SECURE SCREWS USING ITEM ⑩
8. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186347	TDRR	10-MAY 63	ARS
C		CHANGE IN ACCORDANCE WITH MXC 188272		29 JUL 63	C.A.M. E F
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 24877		29 OCT 63 3 NOV 63	J.J.J
E		CHANGE IN ACCORDANCE WITH CM 193209 PER TDRR 08166		3 JAN 64	JE
F		ADDED FLAG NOTE 4, ITEM 7 P/N WAS 1015831-257, ADDED ITEM 10 & ASSOC. INFO. PER CM 194136 PER TDRR 08167		22 JAN 64	
G		CHANGE IN ACCORDANCE WITH CM 196459 PER TDRR 08168	—	1 APR 64	FK
H		REVISED PER TDRR 10873		17 JUL 64	RJF



FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01475 DATE 5 June 1963

Ⓑ REPLACES REVISION A WITH CHANGE B

SEE NOTE 8

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		11	PS-1900039	PROCUREMENT SPECIFICATION
			AR		10	MIL-S-40083-C130	(ES 2544-5) SEALING COMPOUND
			4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
			10		8	1016005-1	SHIM, LAMINATED
			8		7	AN507C832R12	(1897003-568) SCREW, FLAT HD, 100°
			8		6	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			1		5	1901304-125	NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE L H
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE R H
			2		2	1900015-041	HANDLE ASSEMBLY
			1		1	1900020-011	READOUT, COUNTER
QUANTITY REQUIRED			011	EFFECTIVITY		LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON
1900000	1900000
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE. WISCONSIN
ACSP PN SK4440
DRAWN E. LITZOW DATE 4APR63
MALE KOWSKI 10APR63
CHECKED R KORDES 10APR63
APPROVAL A.J. KODEL 10APR63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON. TEXAS

INDICATOR, COUNTER, REMOTE
ASSEMBLY

CODE IDENT NO.
SIZE E
1900039
SCALE —
SHEET 1 OF 1

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

						TO BE ASSIGNED	SLIDES
			2			1900015-041	HANDLES
			1			1900020-011	COUNTER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44440
DRAWN E. LITZOW DATE 4-4-63
CHECKED 10 APR 63
APPROVAL R. Kordes 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, COUNTER, REMOTE
ASSEMBLY

CODE IDENT NO.
SIZE C
1900039
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

(M)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC186348	TDRR 01477	5 June 63	GLS & LARS

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 **DATE** 24 Apr 63

(A) REPLACED WITH CHANGE
REVISION B

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
						TO BE ASSIGNED	SLIDES
			2			1900015-051	HANDLES
			1			1900032-011	COUNTER

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44258
DRAWN E. LITZOW DATE 4-4-63
CHECKED 11 APR 63
APPROVAL K. E. 4-11-63
APPROVAL 11 APR 63
NASA APPROVAL 4/24/63
J. P. 4-24-63
MIT APPROVAL W. Kupfer 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER
ASSEMBLY

CODE IDENT NO.
SIZE C
1900041
SCALE —
SHEET

MIL 1078C-P

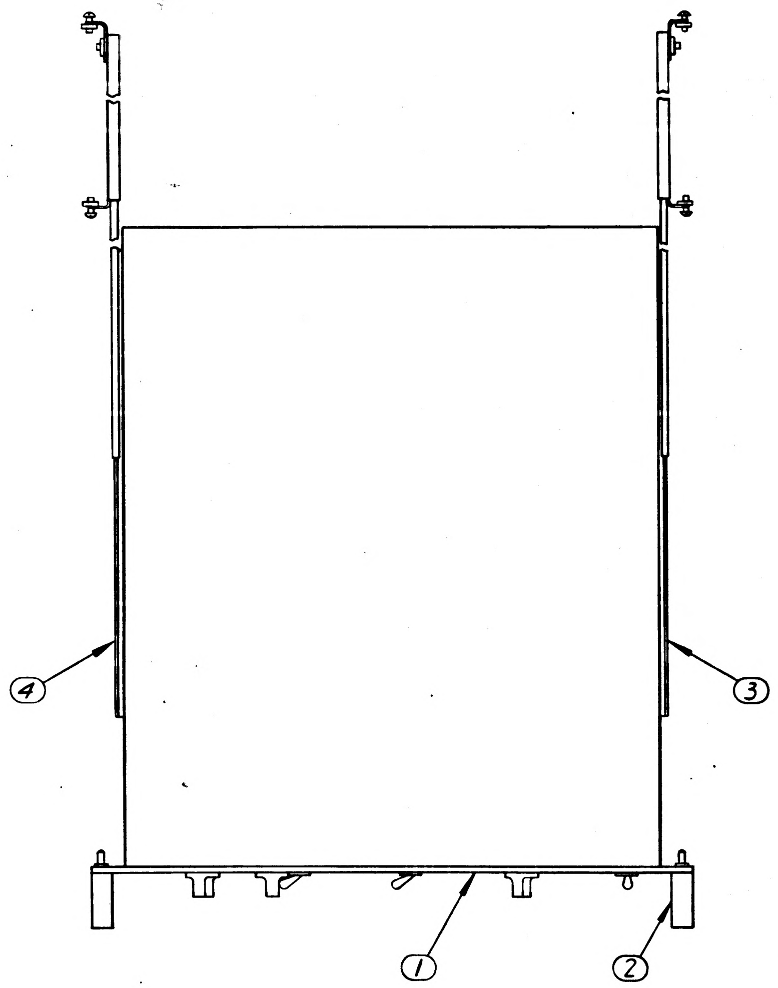
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

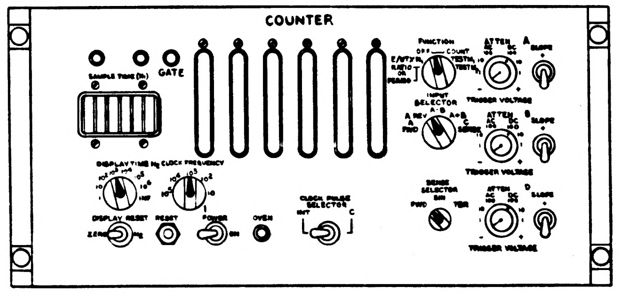
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-267)

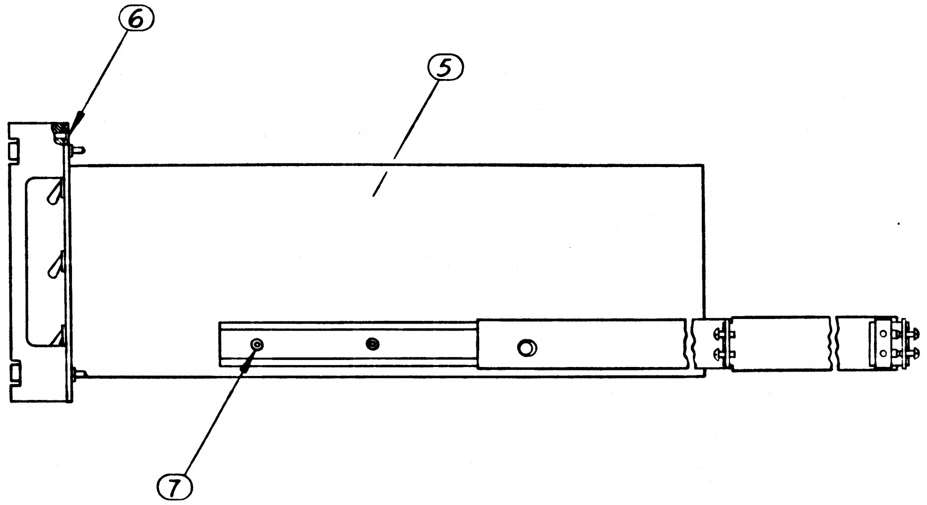
TORQUE ITEM ⑦ TO 37-40 INCH POUNDS AT INSTALLATION

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER NIXC186348	T022	13 MAY 63	ARS
		Replaces Rev A	0147	5 June	





COUNTER
SAMPLE TIME (Hz)
GATE
FUNCTION
OFF
COUNT
RATIO OR PERIOD
INPUT SELECTOR
A REV
A-B
A+B
A FWD
C SERIES
ATTEN
AC
DC
A
B
D
SLOPE
TRIGGER VOLTAGE
DISPLAY TIME
CLOCK FREQUENCY
DISPLAY RESET
ZERO
RESET
POWER
ON
OVEN
CLOCK PULSE SELECTOR
INT
C
SENSE SELECTOR
FWD



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01477 **DATE** 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

1900041 B

			8		7	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			8		6	1015831-257	SCREW-FLAT HEAD, 100° HEX SOCKET
			1		5		NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
			2		2	900015-051	HANDLE ASSEMBLY
			1		1	900032-011	COUNTER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± —— ± —— ± ——

DO NOT SCALE THIS DRAWING

MATERIAL ——

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK44258

DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 11 APR 63
APPROVAL K.E. JURSS 11 APR 63
APPROVAL A.J. KODEL 11 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER
ASSEMBLY

CODE IDENT NO
SIZE E
1900041
SCALE ——
SHEET

INCHES
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH
STANDARDS PRESCRIBED BY MIL-D-70327

IDENTIFY USING DRAWING NO. AND REVISION
LETTER PER MIL-STD-130 (*ES-267*)

TORQUE ITEM ⑦ TO 37-40 INCH POUNDS
AT INSTALLATION

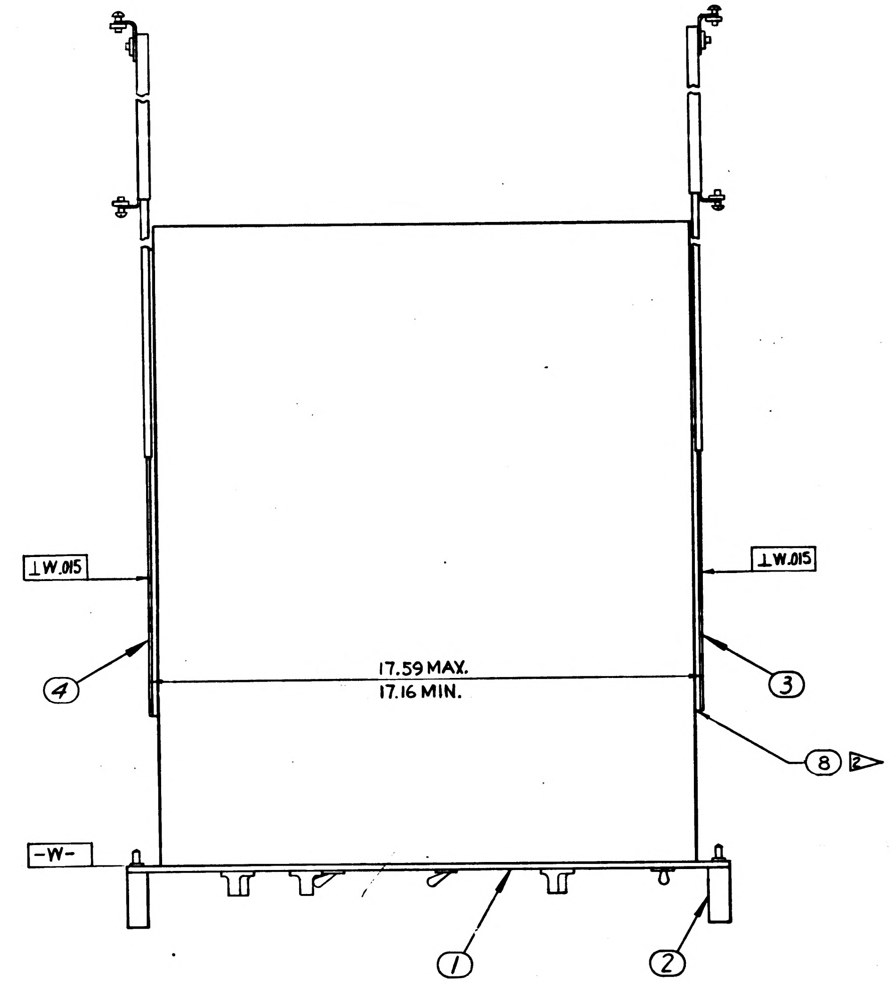
1▷ MARK WEIGHT PER ND 1002123 (50 LB).

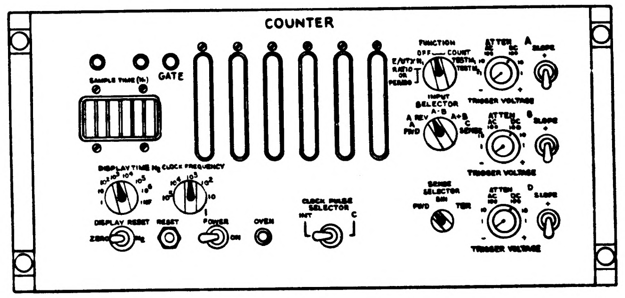
2▷ SHIM TO FIT, BOTH SIDES, QUANTITY AS REQUIRED.
PEEL OFF EXCESS SHIM STOCK.

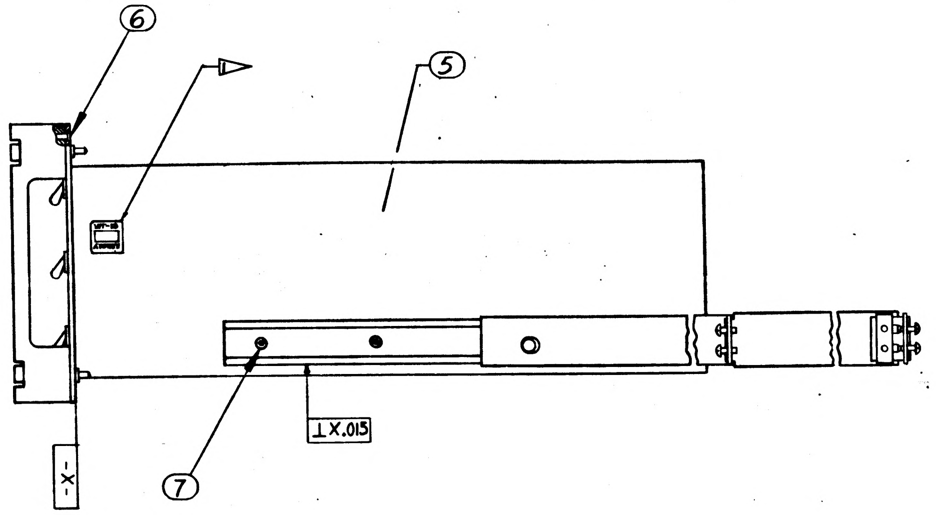
SERIALIZE PER ND 1002023

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		COMPLETELY REVISED AND REDRAWN PER MXC 186348	TDRR	3 MAY 63	ARS
		REPLACES REVISION A	01477	5 Jun 63	cwk
C		*CHANGE IN ACCORDANCE WITH MXC 188273*	MXC 88273	29 JUL 63	C.A.M.
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR *04879*		29 OCT 63	J.J.J.


⊥W.015
⊥W.015
④
③
17.59 MAX.
17.16 MIN.
⑧ 2▷
-W-
①
②


COUNTER
SAMPLE TIME
GATE
FUNCTION
OFF
COUNT
RATIO OR PERIOD
ATTEN
AC
DC
A
SLOPE
TRIGGER VOLTAGE
INPUT SELECTOR
A REV
A-B
A+B
A FWD
C SERIES
B
TRIGGER VOLTAGE
DISPLAY TIME
CLOCK FREQUENCY
SENSE SELECTOR
BIN
FWD
TER
D
CLOCK PULSE SELECTOR
INT
C
DISPLAY RESET
ZERO
RESET
POWER
ON
OVEN
TRIGGER VOLTAGE



FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01477 DATE 5 June 63

Ⓑ REPLACES REVISION A
WITH CHANGE B

			4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
			10		8	10160051-1	SHIM, LAMINATED
			8		7	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			8		6	1015831-257	SCREW-FLAT HEAD, 100° HEX SOCKET
			1		5	1900704	NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900032-011	COUNTER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44258

		DATE
DRAWN	*E. LITZOW*	*4 APR 63*
CHECKED	*MALIKOWSKI*	*11 APR 63*
APPROVAL	*K.E. JURSS*	*11 APR 63*
APPROVAL	*A.J. KODEL*	*11 APR 63*

NASA APPROVAL 6/5/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER
ASSEMBLY

CODE IDENT NO.
SIZE E
1900041
SCALE —
SHEET

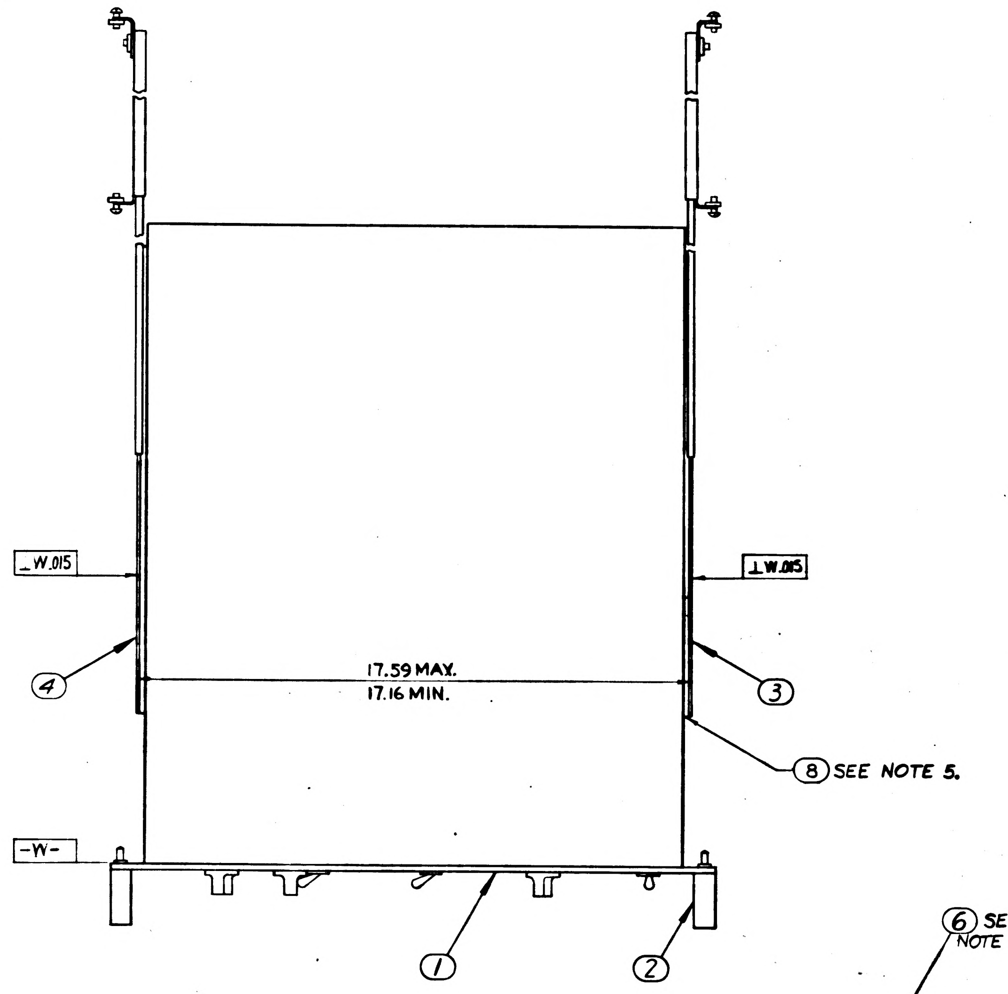
1900041
B

INCHES
PHOTOGRAPHIC SCALE ONLY

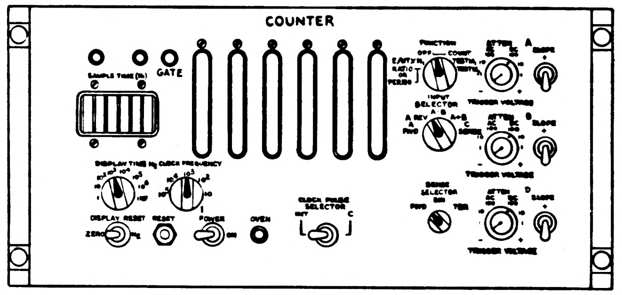
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. ~~IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130 (ES-207)~~
3. TORQUE ITEM ⑦ TO 37-40 INCH POUNDS AT INSTALLATION
4. MARK WEIGHT PER ND 1002123 (50 LB).
5. SHIM TO FIT, BOTH SIDES, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023.
7. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 5 IN ACCORDANCE WITH ND 1002023 LETTERS AND NUMERALS TO BE .06 HIGH.
8. SECURE SCREWS USING ITEM ⑩.
9. *MARK APPLICABLE REVISION LETTER (REV___.) PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.*
10. *THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.*

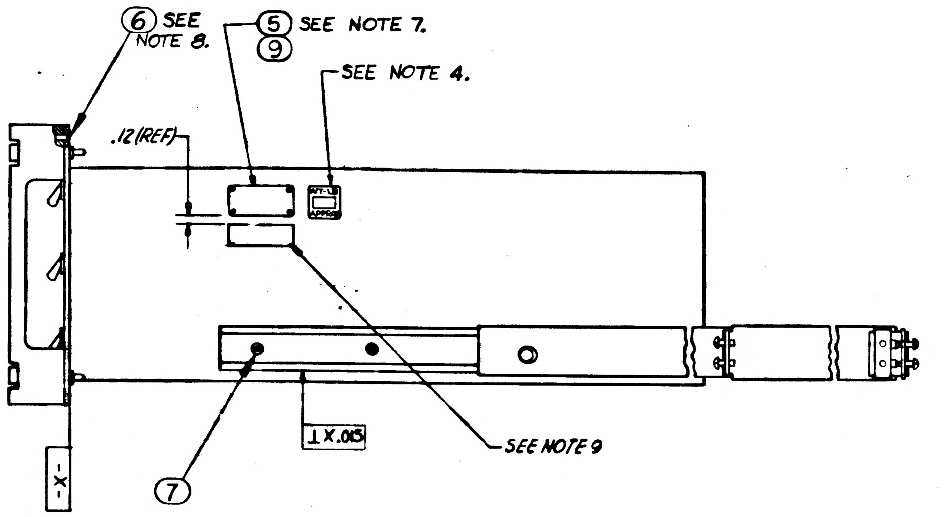
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186348	TDRR	13 MAY 63	ARS
		REPLACES REVISION A	01477	5 June 63	
C		CHANGE IN ACCORDANCE WITH MXC 188273	MXC 188273	29 JUL 63	C.A.M.
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 4879		29 OCT 63	J.J.J.
E		CHANGE IN ACCORDANCE WITH CM 193210 PER TDRR 06196		30 DEC 63	
F		CHANGE IN ACCORDANCE WITH 194137 PER TDRR 06197	—	30	
G	—	CHANGE IN ACCORDANCE WITH CM 96054 PER TDRR 0898	—	9 MAR 64	



W .015
⊥W.015
-W-
17.59 MAX.
17.16 MIN.
④
③
⑧ SEE NOTE 5.
①
②



COUNTER
SAMPLE TIME
GATE
FUNCTION
INPUT SELECTOR
ATTEN
SLOPE
TRIGGER VOLTAGE
DISPLAY TIME
CLOCK FREQUENCY
DISPLAY RESET
ZERO
RESET
POWER
OVEN
CLOCK PULSE SELECTOR
SENSE SELECTOR



⑥ SEE NOTE 8.
⑤ SEE NOTE 7.
⑨
SEE NOTE 4.
.12 (REF)
⊥X.015
-X-
⑦
SEE NOTE 9

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01477 DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

SEE NOTE 10

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			ON				
			X		11	1900041	PROCUREMENT SPECIFICATION
			AR		10	MIL-S-40083-CL3	SEALING COMPOUND (ES-2544-5)
			4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
			10		8	1016005-1	SHIM, LAMINATED
			8		7	1006783-44	SCREW, BUTTON HEAD, HEX SOCKET
			8		6	1015831-253	SCREW-FLAT HEAD, 100° HEX SOCKET
			1		5	1901304-119	NAMEPLATE
			1		4	1015785-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
			1		3	1015785-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900032-011	COUNTER

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK 44258

DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 11 APR 63
APPROVAL K.E. JURSS 11 APR 63
APPROVAL A.J. KODEL 11 APR 63
NASA APPROVAL 6/5/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

COUNTER
ASSEMBLY

CODE IDENT NO
SIZE E
1900041
SCALE —
SHEET

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 **DATE** 24 Apr 63

						TO BE ASSIGNED	SLIDES
			2			1900015-051	HANDLES
			1			1900032-011	COUNTER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44258
DRAWN E. LITZOW DATE 4-4-63
11 APR 63
CHECKED
APPROVAL K. E. [illegible] 4-11-63
APPROVAL [illegible] 11 APR 63
NASA APPROVAL [illegible] 4/24/63
J. P. [illegible] 4-24-63
MIT APPROVAL W. Kupfer 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

COUNTER
ASSEMBLY

CODE IDENT NO.
SIZE C
1900041
SCALE —
SHEET

MIL 1078C-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

(M)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC 186349	TDRR 0482	10 MAY 63	W.E. C.G.K. / ARS

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63.

Ⓐ REPLACED WITH CHANGE BY REVISION B.

						TO BE ASSIGNED	SLIDES
			2			1900015-061	HANDLES
			1			1900018-011	VOLTMETER
			011	EFFEC-TIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44294
DRAWN E. LITZOW DATE 4-4-63
CHECKED 10 APR 63
APPROVAL R. Kordw 4/10
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J P 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE C
1900042
SCALE —
SHEET

MIL 1078C—P

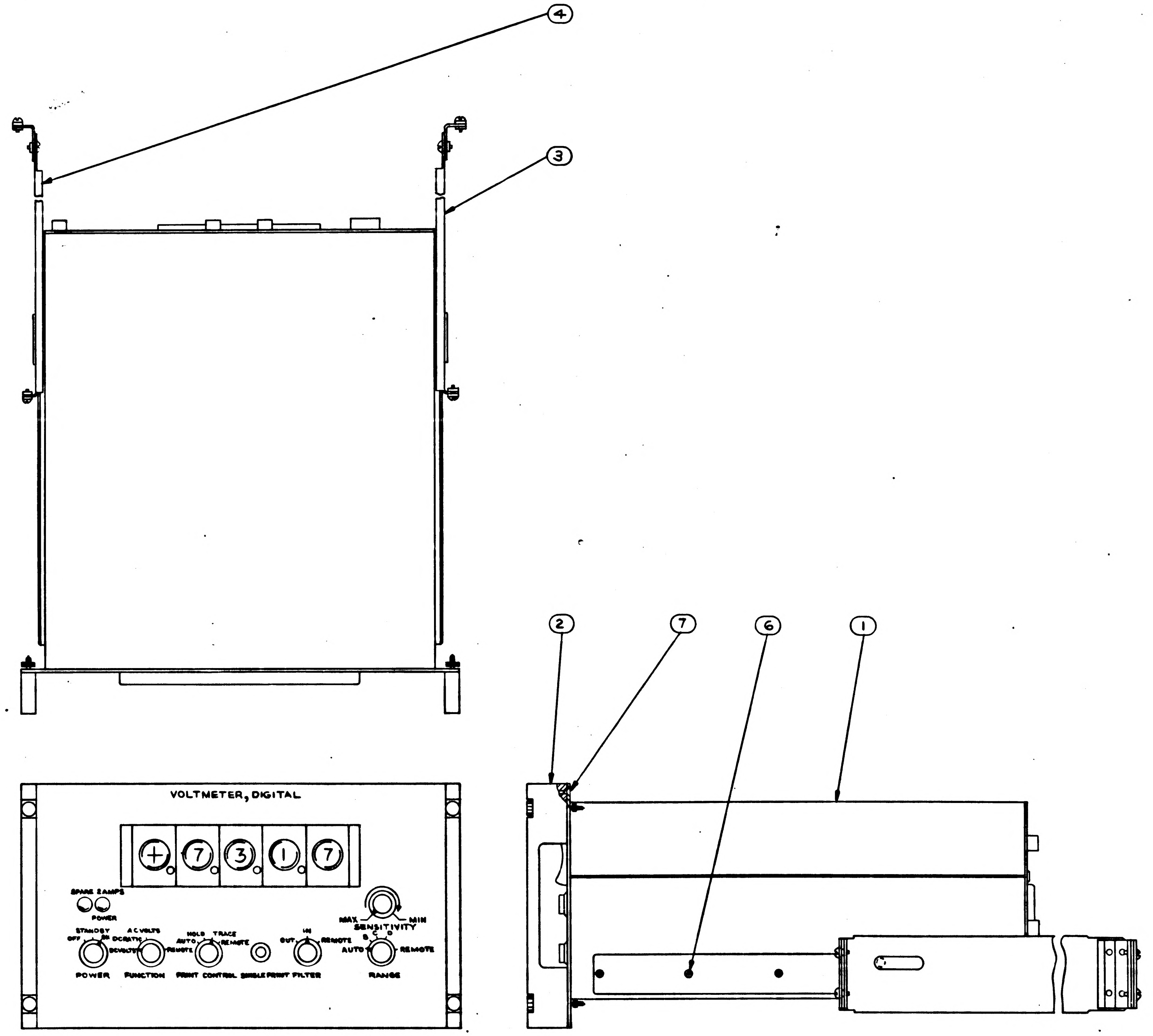
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH
STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING No, & REVISION
LETTER PER MIL-STD-130 (ES-267)

TORQUE ITEM ⑥ TO 37-40 INCH POUNDS
AT INSTALLATION.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC ~~186349~~ [illegible] Rev A	~~DRR~~ 01482	10 MAY 63	[illegible]


④
③
VOLTMETER, DIGITAL
+ 7 3 1 7
SPARE 2AMPS
POWER
MAX
MIN
SENSITIVITY
STANDBY
OFF
ON
AC VOLTS
DC RATIO
DC VOLTS
REMOTE
HOLD
TRACE
AUTO
REMOTE
IN
OUT
REMOTE
B C D
AUTO
REMOTE
POWER
FUNCTION
PRINT CONTROL
SINGLE PRINT
FILTER
RANGE
②
⑦
⑥
①

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01482 **DATE** 5 June 63

Ⓑ REPLACES REVISION A
WITH CHANGE B

			8		7	1015831-257	SCREW-FLAT HD, 100° HEX SOCKET
			10		6	1015826-296	SCREW-FLAT HD. HEX SOCKET
			1		5		NAMEPLATE
			1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
			1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900018-011	VOLTMETER, DIGITAL
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK 44294

DRAWN E. LITZOW DATE 4 APR63
MALIKOWSKI 10APR63
CHECKED
R. KORDES 10APR63
APPROVAL
A.J. KODEL 10APR63
APPROVAL

NASA APPROVAL [illegible] 6/4/63
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900042
SCALE —
SHEET

APOLLO G&N Specification
PS-1900042 B

Class A Release
TDRR 17863

PROCUREMENT SPECIFICATION

FOR

VOLTMETER, DIGITAL ASSEMBLY

Record of Revisions

Ⓜ

Date	Revision Letter	TDRR No.	Pages Revised	Approvals	
				MIT	NASA
—	A	104[illegible]	1-8, 11, 14&16/ECO-	—	—
3/26/65	B	17863	1, 4, 6, thru 18 ,	W. K. .	A. M.

This specification consists of page i to iii and 1 to 18 inclusive.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

IDENTIFY USING DRAWING No. & REVISION LETTER PER MIL-STD-130 (ES-267)

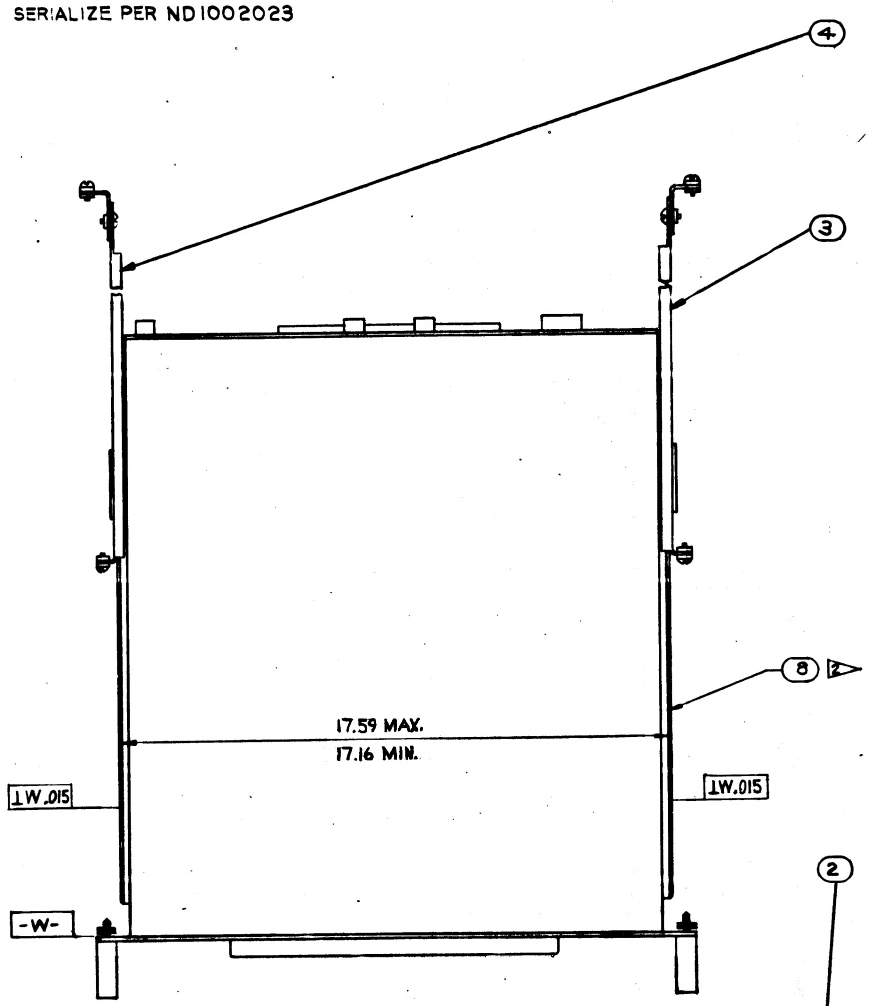
TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.

1. MARK WEIGHT ND1002123 (60 LB).

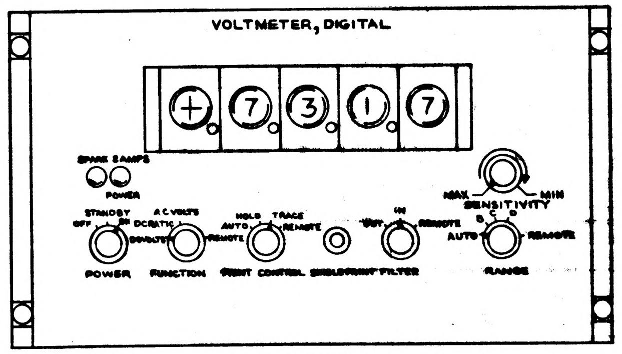
2. SHIM BOTH SIDES TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.

SERIALIZE PER ND1002023

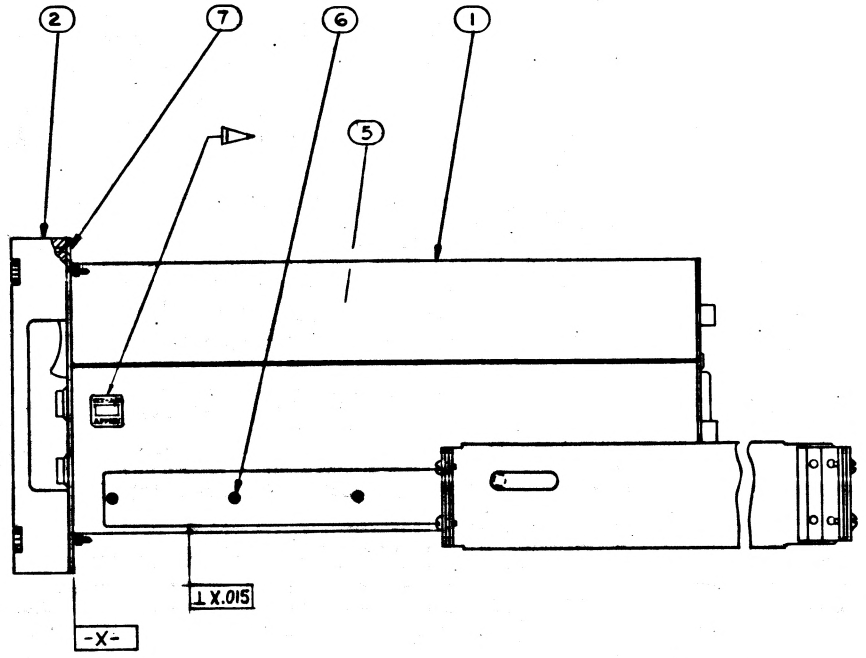
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		COMPLETELY REVISED AND REDRAWN PER MXC 186349 Replaces Rev A	TDRR 01482	10 MAY 63	[illegible] WARS
C		CHANGE IN ACCORDANCE WITH MXC 188274	MXC 88274	29 JUL 63	C.A.N.
D		~~CHANGED IN ACCORDANCE WITH~~ ~~MXC~~ 191407 PER TDRR 04981		29 OCT 63 10 [illegible] 63	J.J.J. [illegible]



4
3
8
2
17.59 MAX.
17.16 MIN.
⊥W.015
⊥W.015
-W-



VOLTMETER, DIGITAL
+ 7 3 1 7
SPARE 2 AMPS
POWER
STANDBY
OFF
ON
A C VOLTS
DC RATIO
DC VOLTS
REMOTE
HOLD
TRACE
AUTO
REMOTE
IN
OUT
REMOTE
MAX
MIN
SENSITIVITY
B C D
AUTO
REMOTE
POWER
FUNCTION
PRINT CONTROL
SINGLE PRINT
FILTER
RANGE



2
7
6
1
5
1
⊥X.015
-X-

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01482 DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

			4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
			12		8	1016005-1	SHIM LAMINATED
			8		7	1015831-257	SCREW-FLAT HD, 100° HEX SOCKET
			10		6	1015826-296	SCREW-FLAT HD, HEX SOCKET
			1		5	1900704	NAMEPLATE
			1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
			1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900018-011	VOLTMETER, DIGITAL
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44294
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 10 APR 63
APPROVAL R. KORDES 10 APR 63
APPROVAL A.J. KODEL 10 APR 63
NASA APPROVAL [illegible]
L. Geisman 6/4/63
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900042
SCALE —
SHEET

1900042 D

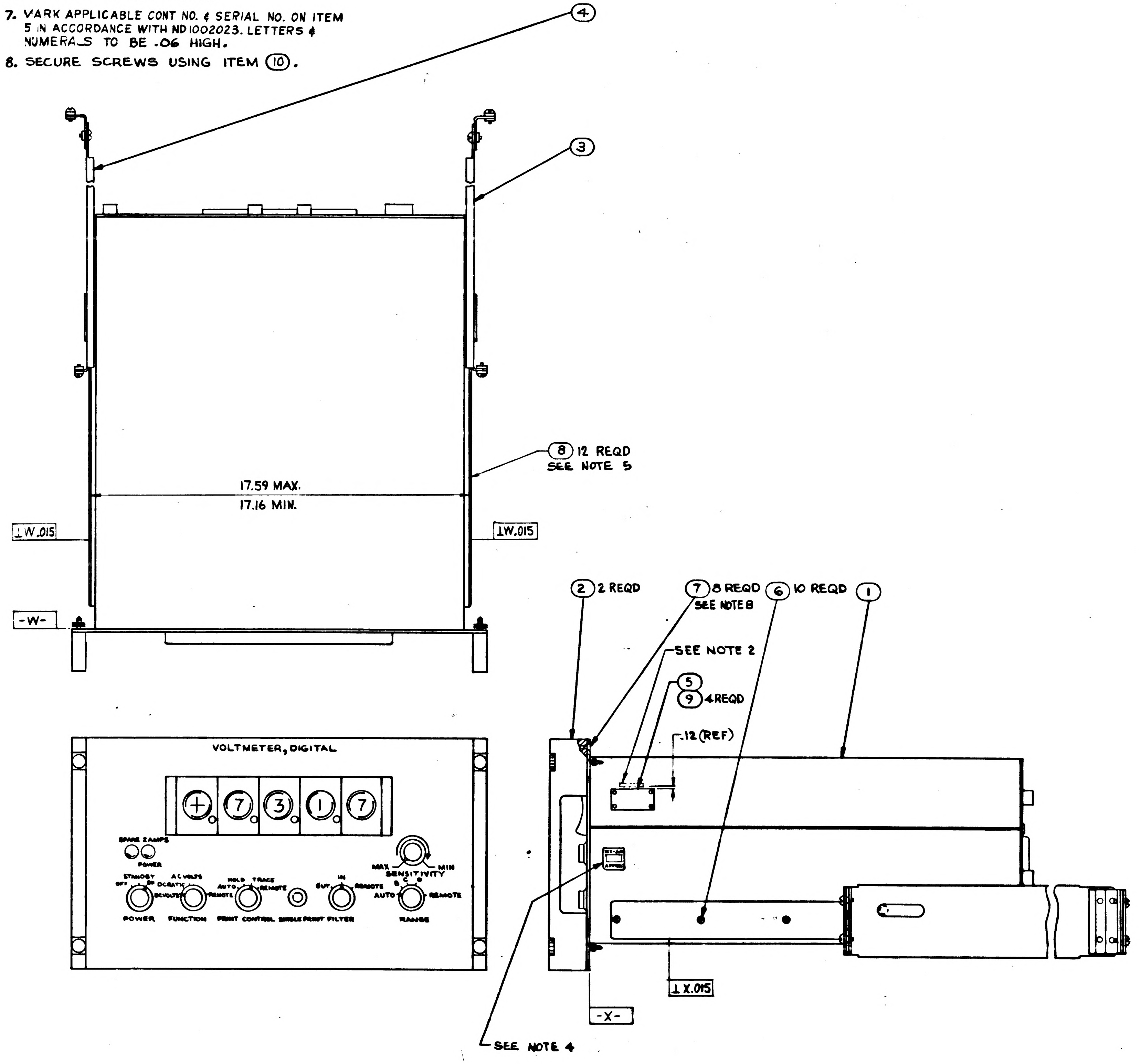
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK: APPLICABLE REVISION LETTER (REV__.) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT ND1002123 (60 LB).
5. SHIM BOTH SIDES TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND1002023
7. MARK APPLICABLE CONT NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
8. SECURE SCREWS USING ITEM ⑩.

NOTES (CONTINUED):

9. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186349	DRR 01482	10 MAY 63	
C		CHANGE IN ACCORDANCE WITH MXC 188274	MXC 188274	29 JUL 63	C.A.M.
D		CHANGE IN ACCORDANCE WITH MXC 191107 PER TDRR 06481		29 OCT 63	J.J.J. WR
E		CHANGE IN ACCORDANCE WITH CM 192885 PER TDRR 06169		8 JAN 64	R.D.
F		CHANGE IN ACCORDANCE WITH CM 194138 PER TDRR 06170		24 JAN 64	
G		CHANGE IN ACCORDANCE WITH CM 196021 PER TDRR 06171		16 MAR 64	KwK


④
③
⑧ 12 REQD
SEE NOTE 5
17.59 MAX.
17.16 MIN.
⊥W.015
⊥W.015
-W-
VOLTMETER, DIGITAL
+ 7 3 1 7
SPARE 2 AMPS
POWER
STANDBY
OFF
ON
AC VOLTS
DC RATIO
DC VOLTS
REMOTE
HOLD
TRACE
AUTO
REMOTE
OUT
IN
REMOTE
MAX
MIN
SENSITIVITY
B C D
AUTO
REMOTE
POWER
FUNCTION
PRINT CONTROL
SINGLE PRINT
FILTER
RANGE
② 2 REQD
⑦ 8 REQD
SEE NOTE 8
⑥ 10 REQD
①
SEE NOTE 2
⑤
⑨ 4 REQD
.12 (REF)
⊥X.015
-X-
SEE NOTE 4

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01472 DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

SEE NOTE 9

					ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		11	PS1900042	PROCUREMENT SPECIFICATION
			AR		10	MIL-S-40083-C130	(ES-2544) SEALING COMPOUND
			4		9	AN535-00-4	1897109-004 SCREW, DRIVE
			12		8	1016005-1	SHIM LAMINATED
			8		7	1015831-253	SCREW-FLAT HD, 100° HEX SOCKET
			10		6	1015826-300	SCREW-FLAT HD, HEX SOCKET
			1		5	1901304-117	NAMEPLATE
			1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
			1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900018-011	VOLTMETER, DIGITAL
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK 44294
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 10 APR 63
APPROVAL R. KORDES 11 APR 63
APPROVAL W. KOBEL 11 APR 63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL
ASSEMBLY

CODE IDENT NO
SIZE E
1900042
SCALE —
SHEET

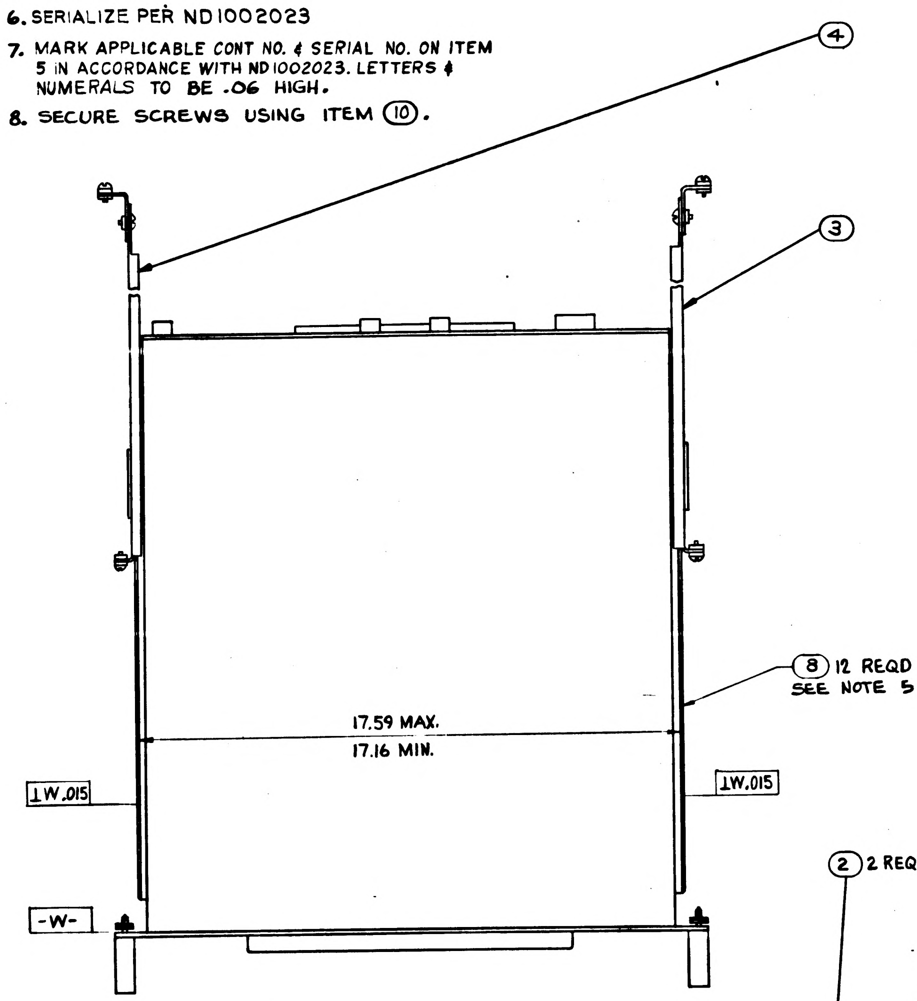
G
1900042
B

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK: APPLICABLE REVISION LETTER (REV___) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT ND1002123 (60 LB).
5. SHIM BOTH SIDES TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND1002023
7. MARK APPLICABLE CONT NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
8. SECURE SCREWS USING ITEM ⑩.

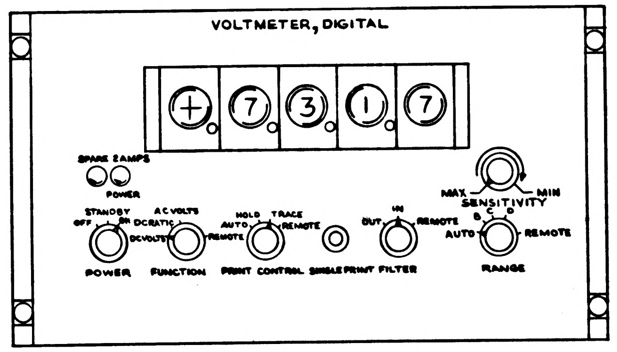
NOTES (CONTINUED):

9. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

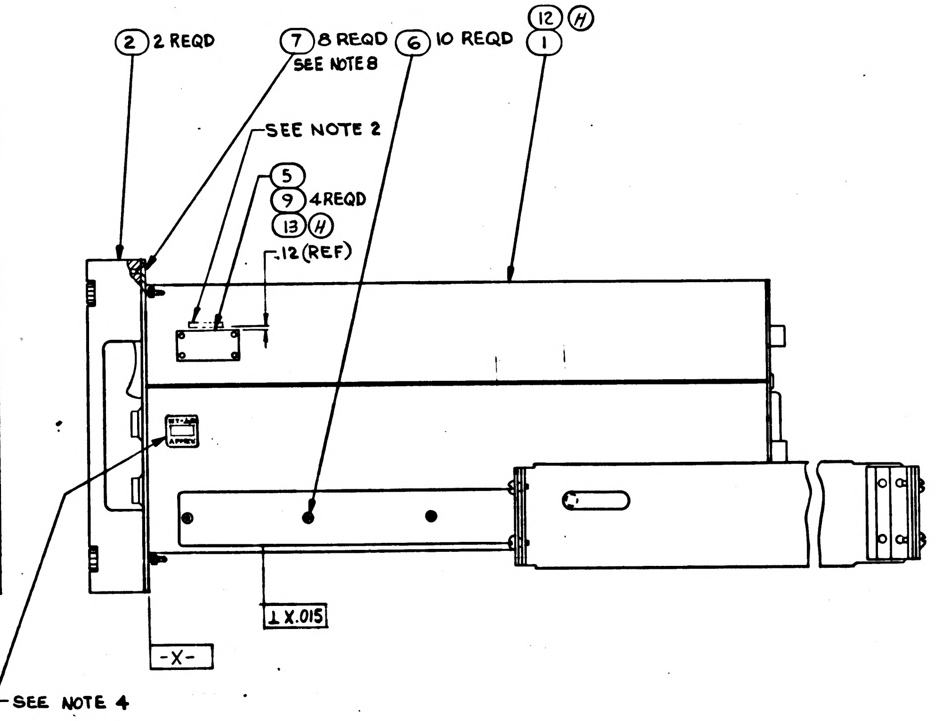
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186349 Replaces Rev A	TDRR 01482	10 MAY 63	WARS
C		CHANGE IN ACCORDANCE WITH MXC 188274	MXC 188274	29 JUL 63	C.A.M.
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 24981		29 OCT 63	J.J.J. WR
E		CHANGE IN ACCORDANCE WITH CM 192885 PER TDRR 08169		8 JAN 64	JEL R.D.
F		CHANGE IN ACCORDANCE WITH CM 194138 PER TDRR 08170		24 JAN 64	
G		CHANGE IN ACCORDANCE WITH CM 196021 PER TDRR 08171		16 MAR 64	KWH EF
H		REVISED PER TDRR 10415		29 JUN 64	FL MEM



④
③
⑧ 12 REQD
SEE NOTE 5
17.59 MAX.
17.16 MIN.
⊥W.015
⊥W.015
-W-



VOLTMETER, DIGITAL
+ 7 3 1 7
SPARE LAMPS
POWER
STANDBY
OFF ON
AC VOLTS
DC RATIO
DC VOLTS
HOLD TRACE
AUTO REMOTE
OUT IN
REMOTE
MAX SENSITIVITY MIN
AUTO REMOTE
POWER
FUNCTION
PRINT CONTROL
SINGLE PRINT
FILTER
RANGE



② 2 REQD
⑦ 8 REQD
SEE NOTE 8
⑥ 10 REQD
⑫ Ⓗ
①
SEE NOTE 2
⑤
⑨ 4 REQD
⑬ Ⓗ
.12 (REF)
⊥X.015
-X-
SEE NOTE 4

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01482 DATE 5 June 63

Ⓑ REPLACES REVISION A
WITH CHANGE B

SEE NOTE 9

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1			13	1901304-147	NAMEPLATE
		1			12	1901591-011	VOLTMETER, DIGITAL
		X	X		11	PS1900042	PROCUREMENT SPECIFICATION
		AR	AR		10	MIL-S-40083-C130	(ES-2544) SEALING COMPOUND
		4	4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
		12	12		8	1016005-1	SHIM LAMINATED
		8	8		7	1015831-253	SCREW-FLAT HD, 100° HEX SOCKET
		10	10		6	1015826-300	SCREW-FLAT HD, HEX SOCKET
			1		5	1901304-117	NAMEPLATE
		1	1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
		1	1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
		2	2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900018-011	VOLTMETER, DIGITAL
		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44294
DRAWN E. LITZOW DATE 4 APR63
CHECKED MALIKOWSKI 10APR63
APPROVAL R. KORDES 10APR63
APPROVAL A.J. KODEL 10APR63
NASA APPROVAL
L. Gedimans 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL
ASSEMBLY

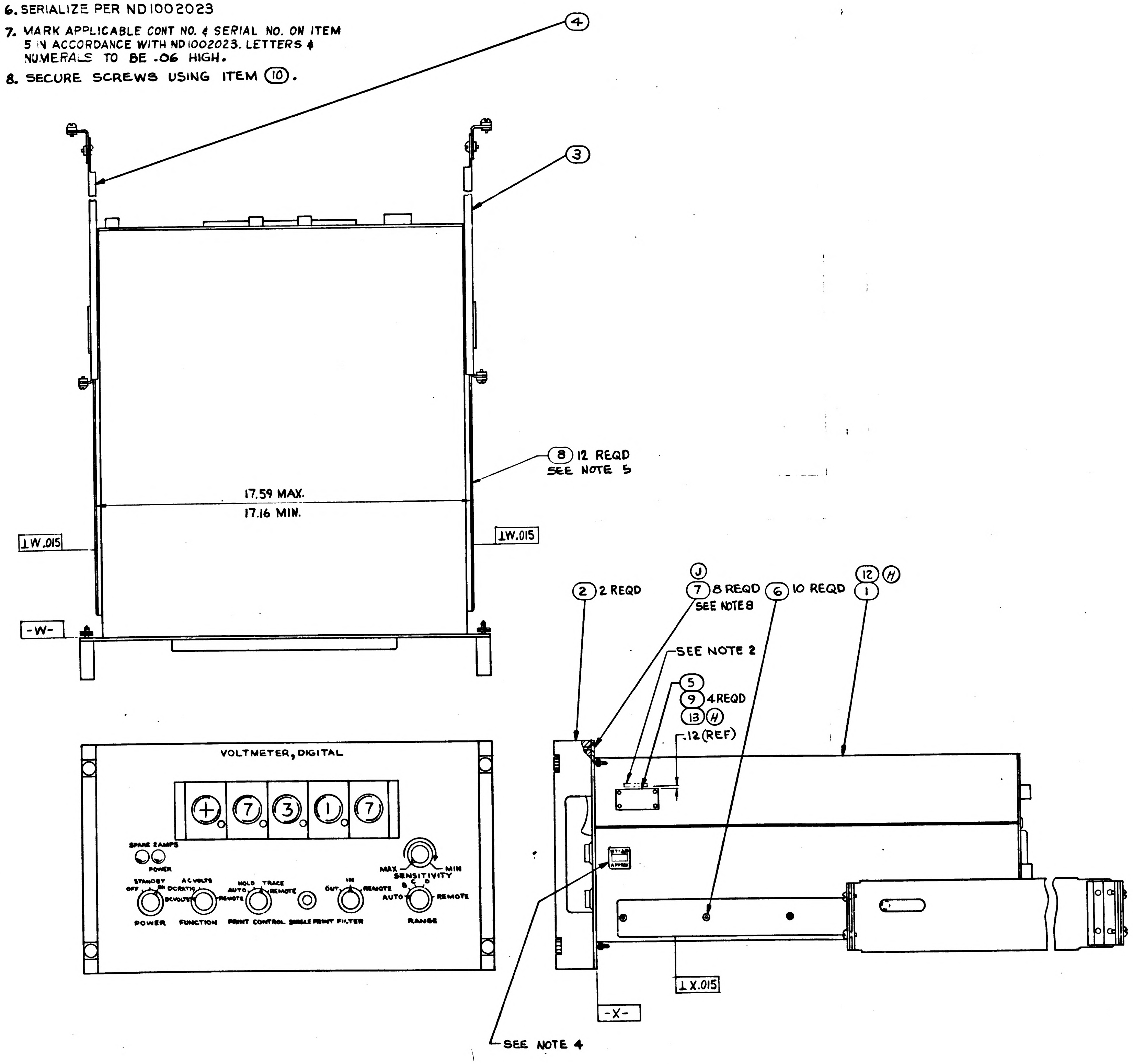
CODE IDENT NO.
SIZE E
1900042
SCALE —
SHEET

1900042 H

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK: APPLICABLE REVISION LETTER (REV __) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT ND1002123 (60 LB).
5. SHIM BOTH SIDES TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND1002023
7. MARK APPLICABLE CONT NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
8. SECURE SCREWS USING ITEM ⑩.

NOTES (CONTINUED):
9. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
Ⓜ B		COMPLETELY REVISED AND REDRAWN PER MXC 186349	TDRR 01482	10 MAY 63	WARS
C		CHANGE IN ACCORDANCE WITH MXC 188274	MXC 88274	29 JUL 63	C.A.M.
Ⓜ D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 04981		29 OCT 63	J.J.J. WH
E		CHANGE IN ACCORDANCE WITH CM 192885 PER TDRR 08169		8 JAN 64	R.D.
F		CHANGE IN ACCORDANCE WITH CM 194138 PER TDRR 08170		24 JAN 64	
Ⓜ G		CHANGE IN ACCORDANCE WITH CM 196021 PER TDRR 08171		16 MAR 64	KWK
Ⓜ H		REVISED PER TDRR 10415		29 JUN 64	FL
J		REVISED PER TDRR 10873		17 JUL 64	


④
③
⑧ 12 REQD
SEE NOTE 5
17.59 MAX.
17.16 MIN.
⊥W.015
⊥W.015
-W-
VOLTMETER, DIGITAL
+ 7 3 1 7
SPARE 2AMPS
POWER
STANDBY
OFF
ON
AC VOLTS
DC RATIO
DC VOLTS
REMOTE
HOLD
TRACE
AUTO
REMOTE
OUT
IN
REMOTE
MAX
MIN
SENSITIVITY
B C D
AUTO
REMOTE
POWER
FUNCTION
PRINT CONTROL
SINGLE PRINT
FILTER
RANGE
② 2 REQD
Ⓙ
⑦ 8 REQD
SEE NOTE 8
⑥ 10 REQD
⑫ Ⓗ
①
SEE NOTE 2
⑤
⑨ 4 REQD
⑬ Ⓗ
.12 (REF)
⊥X.015
-X-
SEE NOTE 4

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01482 DATE 5 June 63

Ⓑ REPLACES REVISION A
WITH CHANGE B

SEE NOTE 9

1			13	1901304-147	NAMEPLATE
1			12	1901591-011	VOLTMETER, DIGITAL
X	X		11	PS1900042	PROCUREMENT SPECIFICATION
AR	AR		10	MIL-S-40083-C130	(ES-2544) SEALING COMPOUND
4	4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
12	12		8	1016005-1	SHIM LAMINATED
8	8		7	AN507C832R12	(1897003-568) SCREW-FLAT HD 100°
10	10		6	1015826-300	SCREW-FLAT HD, HEX SOCKET
	1		5	1901304-117	NAMEPLATE
1	1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
1	1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
2	2		2	1900015-061	HANDLE ASSEMBLY
	1		1	1900018-011	VOLTMETER, DIGITAL
021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED			LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44294
DRAWN E. LITZOW DATE 4 APR63
CHECKED MALIKOWSKI 10APR63
APPROVAL R. KORDES 10APR63
APPROVAL A.J. KODEL 10APR63
NASA APPROVAL
C. Geiman 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

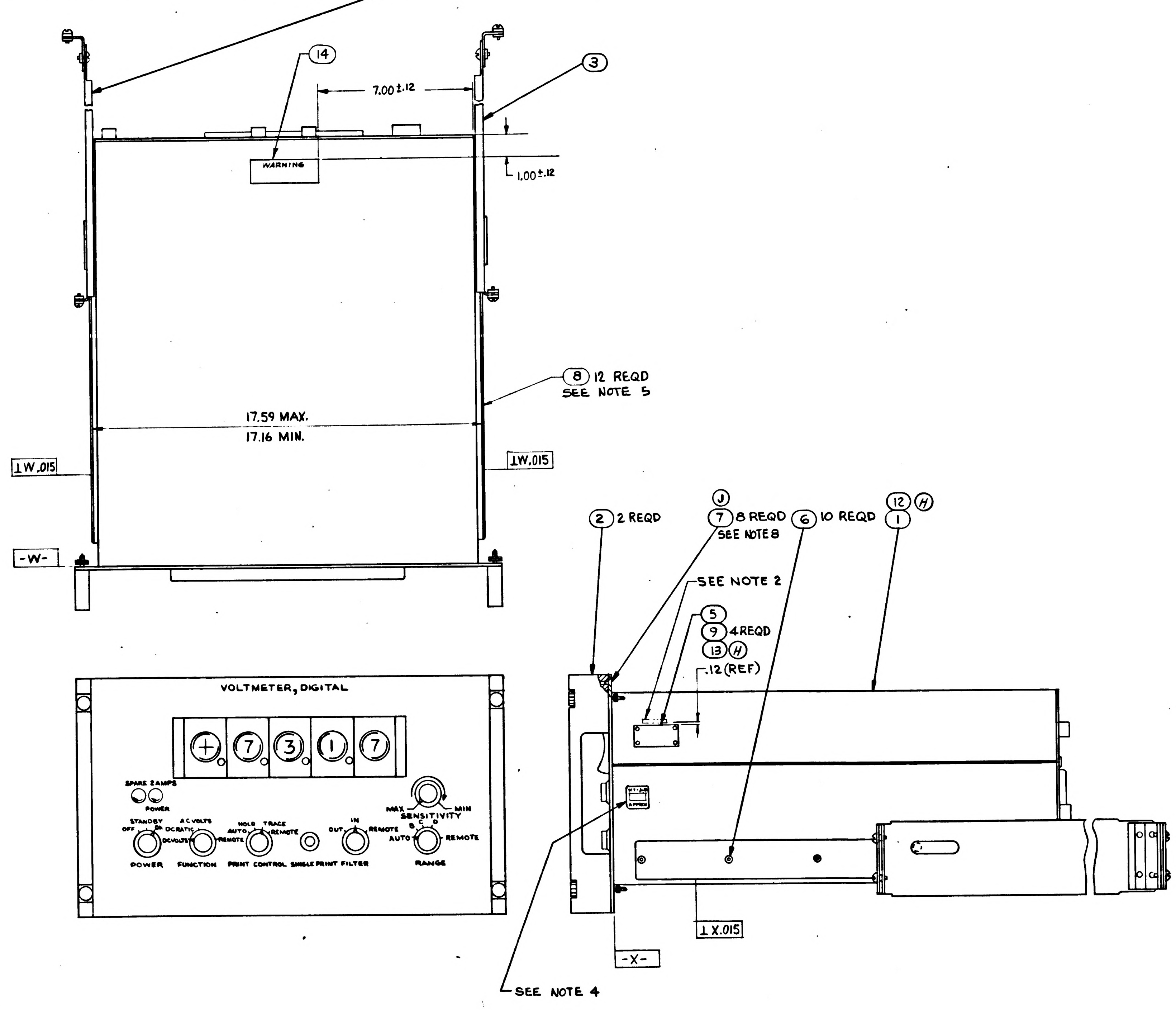
VOLTMETER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900042
SCALE —
SHEET

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK: APPLICABLE REVISION LETTER,(REV__.) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT ND1002123 (60 LB).
5. SHIM BOTH SIDES TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND1002023
7. MARK APPLICABLE CONT NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
8. SECURE SCREWS USING ITEM ⑩.

NOTES (CONTINUED):
9. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186349 Replaces Rev A	TDRR 01482	10 MAY 63	WARS
C		CHANGE IN ACCORDANCE WITH MXC 188274	MXC 88274	29 JUL 63	C.A.M.
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 04681		29 OCT 63	J.J.J. WR
E		CHANGE IN ACCORDANCE WITH CM 192885 PER TDRR 08169		8 JAN 64	EL R.D.
F		CHANGE IN ACCORDANCE WITH CM 194138 PER TDRR 08170		24 JAN 64	
G		CHANGE IN ACCORDANCE WITH CM 196021 PER TDRR 08171		16 MAR 64	KWH
H		REVISED PER TDRR 10415		29 JUN 64	FL
J		REVISED PER TDRR 10873		17 JUL 64	
K		REVISED PER TDRR 11390		3 AUG 64	



④
⑭
③
7.00±.12
WARNING
1.00±.12
⑧ 12 REQD
SEE NOTE 5
17.59 MAX.
17.16 MIN.
⊥W.015
⊥W.015
-W-
VOLTMETER, DIGITAL
+ 7 3 0 7
SPARE LAMPS
POWER
STANDBY OFF ON
AC VOLTS DC RATIO DC VOLTS REMOTE
HOLD TRACK AUTO REMOTE
OUT IN REMOTE
MAX MIN SENSITIVITY
AUTO REMOTE
POWER
FUNCTION
PRINT CONTROL
SINGLE PRINT
FILTER
RANGE
② 2 REQD
Ⓙ
⑦ 8 REQD
SEE NOTE 8
⑥ 10 REQD
⑫ Ⓗ
①
SEE NOTE 2
⑤
⑨ 4 REQD
⑬ Ⓗ
.12 (REF)
⊥X.015
-X-
SEE NOTE 4

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01482 DATE 5 June 63

Ⓑ REPLACES REVISION A WITH CHANGE B

SEE NOTE 9

		1			14	1900953-001	PLATE, INSTRUCTION
		1			13	1901304-147	NAMEPLATE
		1			12	1901591-011	VOLTMETER, DIGITAL
		X	X		11	PS1900042	PROCUREMENT SPECIFICATION
		AR	AR		10	MIL-S-40083-C130	(ES-2544) SEALING COMPOUND
		4	4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
		12	12		8	1016005-1	SHIM LAMINATED
		8	8		7	AN507C832R12	(1897003-568) SCREW-FLAT HD, 100°
		10	10		6	1015826-300	SCREW-FLAT HD, HEX SOCKET
			1		5	1901304-117	NAMEPLATE
		1	1		4	1015791-010	SLIDE ASSEMBLY QUICK RELEASE L.H.
		1	1		3	1015791-009	SLIDE ASSEMBLY QUICK RELEASE R.H.
		2	2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900018-011	VOLTMETER, DIGITAL
		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44294
DRAWN E. LITZOW DATE 4 APR63
MALIKOWSKI 10APR63
CHECKED R. KORDES 10APR63
APPROVAL A.J. KODEL 10APR63
APPROVAL
NASA APPROVAL
L. Gearman 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900042
SCALE —
SHEET

1900042 K
B

1900042

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

						TO BE ASSIGNED	SLIDES
			2			1900015-061	HANDLES
			1			1900018-011	VOLTMETER
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44294
DRAWN E. LITZOW DATE 4-4-63
CHECKED Mac Kenzie 10 APR 63
APPROVAL R. Kordes 4/10
APPROVAL A Riedel 10 APR 63
NASA APPROVAL F. Muhlbach 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL W Kupfer 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE C
1900042
SCALE —
SHEET

MIL 1078C—F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (*ES-267*)

3. TORQUE ITEM (14) TO 37-40 INCH POUNDS AT INSTALLATION.

4. MARK WEIGHT PER ND 1002123 (37 LB)

5. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.

6. SERIALIZE PER ND 1002023

7. MARK APPLICABLE CONT. NO & SERIAL NO. ON ITEM (12) IN ACCORDANCE WITH ND 1002023 LETTERS & NUMERALS TO BE .06 HIGH

8. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.

9. SECURE SCREWS USING ITEM (17).

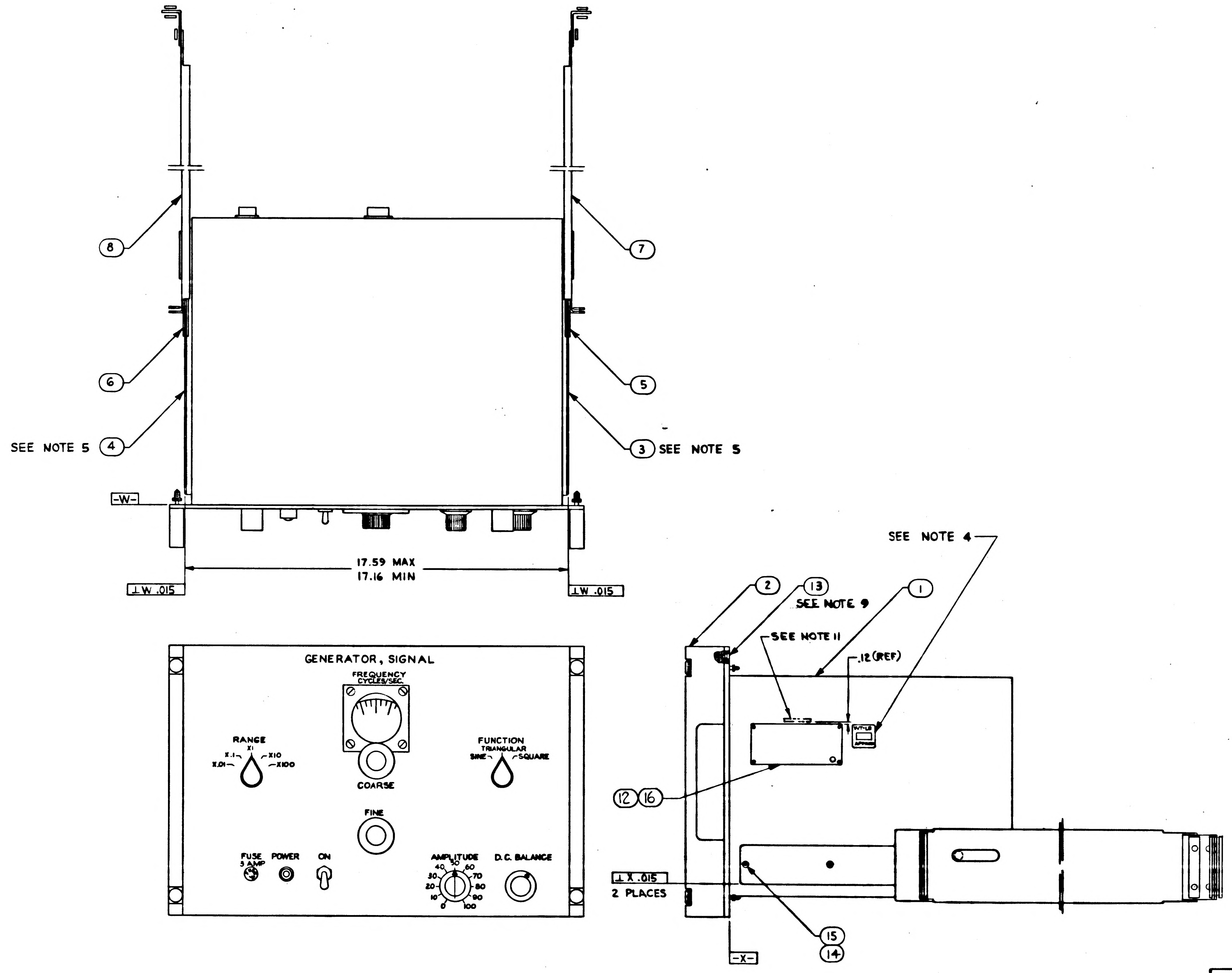
10. THIS SPECIFICATION APPLIES ONLY WHEN THE EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

NOTES: (CONTINUED)

11. MARK APPLICABLE REVISION LETTER (REV _.) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C2		(1) REPLACES REVISION B WITH CHANGE (2) REVISED AND REDRAWN PER MXC 186350	TDRR	13 MAY 63	JEL / HARS
D		CHANGE IN ACCORDANCE WITH MXC 36469		2 AUG 63	WLG / IEB
E		CHANGED IN ACCORDANCE WITH MXC-189582		4 SEP 63	RJM
F		CHANGE IN ACCORDANCE WITH MXC 3-4[illegible] TDRR 04713		29 OCT 63	J.J.J.
				[illegible] 63	
G	C5&A5 A5	ITEM 13 & 14 WAS 14 & 13 RESP. ITEM 14 WAS 1015826-296 PER MXC 191868		10 DEC 63	JEL
H		CHANGE IN ACCORDANCE WITH CM192886 PER TDRR 08172		30 DEC 63	A.M.
J		CHANGE IN ACCORDANCE WITH CM 194139 PER TDRR 08173		16 JAN 64	RJF
K		CHANGE IN ACCORDANCE WITH CM 196022 PER TDRR 08174	—	16 MAR	KWA



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01521 DATE June 12, 1963

(C2) REPLACES REVISION B WITH CHANGE

SEE NOTE 10				X		18	PS1900043	PROCUREMENT SPECIFICATION
				AR		17	MIL-S-40083-C130	(ES-2544-4) SEALING COMPOUND
				4		16	AN535-00-4	(1897109-004) SCREW, DRIVE
				8		15	1016005-1	SHIM, LAMINATED
				8		14	1015826-300	SCREW-FLAT HEAD, HEX SOCKET
				8		13	1015831-253	SCREW-FLAT HEAD, 100°, HEX SOCKET
				1		12	1901304-121	NAMEPLATE
SEE NOTE 8				4		11	1015790-001	SPACER - BAR
SEE NOTE 8				4		10	1015796-001	NUT - BAR
SEE NOTE 8				2		9	1015795-001	BRACKET - REAR SUPPORT
				1		8	1015793-002	SLIDE-STATIONARY SECTION L.H.
				1		7	1015793-001	SLIDE-STATIONARY SECTION R.H.
				1		6	1015794-012	SLIDE-INTERMEDIATE SECTION L.H.
				1		5	1015794-011	SLIDE-INTERMEDIATE SECTION R.H.
				1		4	1015792-014	SLIDE-FRONT SECTION L.H.
				1		3	1015792-014	SLIDE-FRONT SECTION R.H.
				2		2	1900015-061	HANDLE ASSEMBLY
				1		1	1900022-011	GENERATOR-SIGNAL
	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALEKOWSKI 22 APR 63
APPROVAL K.R. JAMES 22 APR 63
APPROVAL Johman 6-12-63

NASA APPROVAL Jack Bernard
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR, SIGNAL
ASSEMBLY

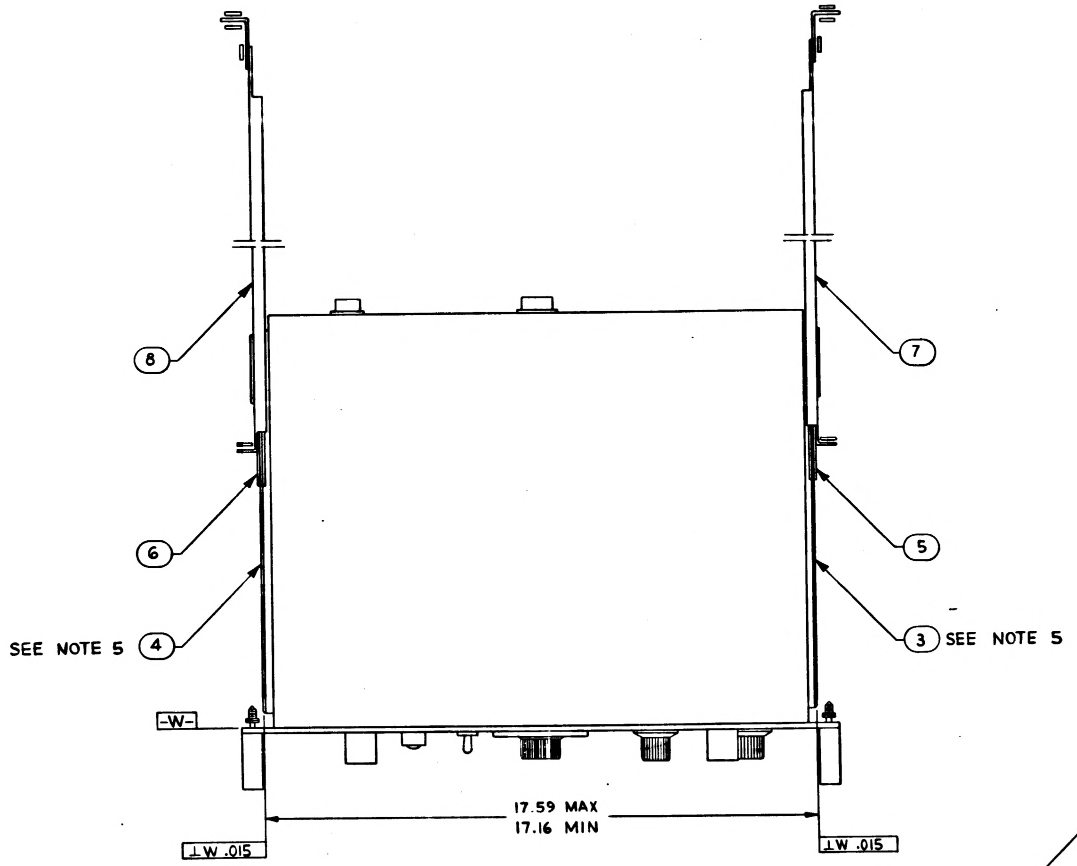
CODE IDENT NO.
SIZE E
1900043
SCALE
SHEET 1

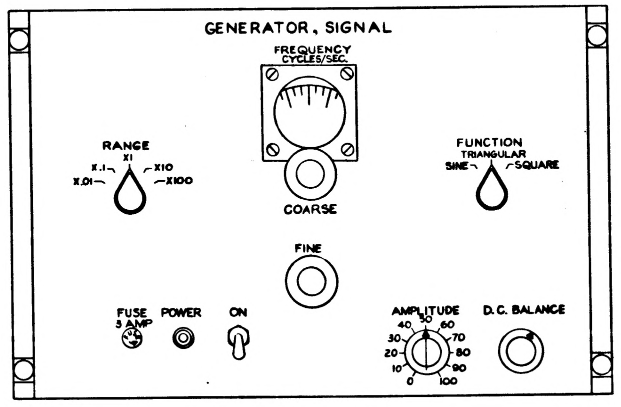
1900043

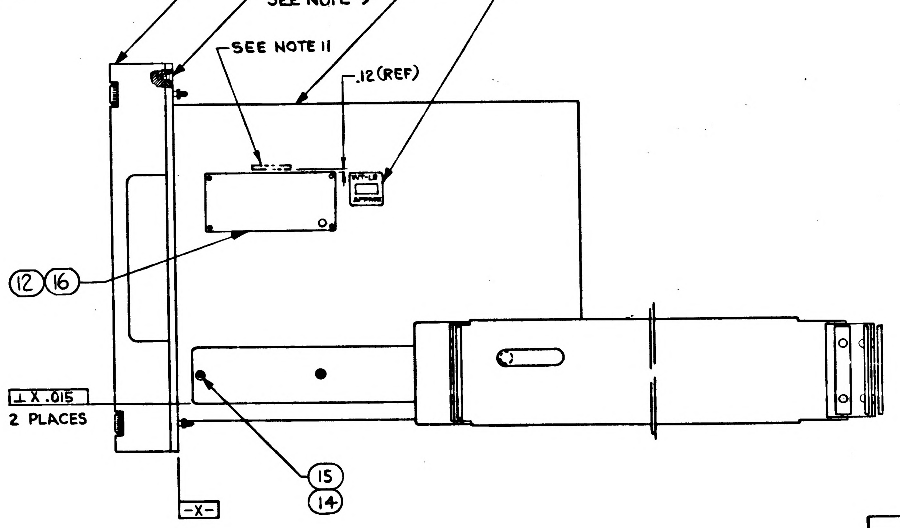
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-180. (ES-267)
3. TORQUE ITEM ⑭ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT PER ND 1002123 (37 LB)
5. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023
7. MARK APPLICABLE CONT NO & SERIAL NO ON ITEM ⑫ IN ACCORDANCE WITH ND 1002023 LETTERS & NUMERALS TO BE .06 HIGH
8. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.
9. SECURE SCREWS USING ITEM ⑰.
10. THIS SPECIFICATION APPLIES ONLY WHEN THE EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

NOTES: (CONTINUED)
11. MARK APPLICABLE REVISION LETTER (REV__) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C2		(1) REPLACES REVISION B WITH CHANGE (2) REVISED AND REDRAWN PER MXC 186350	TDRR	13 MAY 63	JEL / HARS
D		CHANGE IN ACCORDANCE WITH MXC 86469		2 AUG 63	WLG
E		CHANGED IN ACCORDANCE WITH MXC-189582		4 SEP 63	RJM
F		CHANGE IN ACCORDANCE WITH MXC 191407 TDRR 04713		29 OCT 63	J.J.J.
				63	
G	C5&A5 A5	ITEM 13 & 14 WAS 14 & 13 RESP. ITEM 14 WAS 1015826-296 PER MXC 191868		10 DEC 63	JEL
H		CHANGE IN ACCORDANCE WITH CM192886 PER TDRR08172		30 DEC 63	A.M.
J		CHANGE IN ACCORDANCE WITH CM 194139 PER TDRR08173		16 JAN 64	RJF
K		CHANGE IN ACCORDANCE WITH CM 196022 PER TDRR08174	—	16 MAR 64	KWT
L		REVISED PER TDRR 10873		14 JUL 64	RJF







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01521 DATE June 12, 1963

Ⓒ2 REPLACES REVISION B WITH CHANGE

SEE NOTE 10				X		18	PS1900043	PROCUREMENT SPECIFICATION
				AR		17	MIL-S-40083-C130	(ES-2544-4) SEALING COMPOUND
				4		16	AN535-00-4	(1897109-004) SCREW, DRIVE
				8		15	1016005-1	SHIM, LAMINATED
				8		14	1015826-300	SCREW-FLAT HEAD, HEX SOCKET
				8		13	AN507C832R12	(1897003-568) SCREW, FLAT HD 100°
				1		12	1901304-121	NAMEPLATE
SEE NOTE 8				4		11	1015790-001	SPACER - BAR
SEE NOTE 8				4		10	1015796-001	NUT - BAR
SEE NOTE 8				2		9	1015795-001	BRACKET - REAR SUPPORT
				1		8	1015793-002	SLIDE-STATIONARY SECTION L.H.
				1		7	1015793-001	SLIDE-STATIONARY SECTION R.H.
				1		6	1015794-012	SLIDE-INTERMEDIATE SECTION L.H.
				1		5	1015794-011	SLIDE-INTERMEDIATE SECTION R.H.
				1		4	1015792-014	SLIDE-FRONT SECTION L.H.
				1		3	1015792-014	SLIDE-FRONT SECTION R.H.
				2		2	1900015-C61	HANDLE ASSEMBLY
				1		1	1900022-011	GENERATOR-SIGNAL
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
− — − — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW 4 APR 63
MALEKOWSKI 22 APR 63
CHECKED K.R. JAMES 22 APR 63
APPROVAL
APPROVAL L. Gohman 6-12-63
NASA APPROVAL Jack Barnard
MIT APPROVAL Percy K Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR, SIGNAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900043
SCALE
SHEET 1

1900043

1900043

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADDED: 1900004 TO APPLICATION BLOCK.		7 MAY 63	WK

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 **DATE** 8 May 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
						TBA	SLIDES
			2			1900015-071	HANDLES
			1			1900022-011	GENERATOR

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——

DO NOT SCALE THIS DRAWING

MATERIAL ——

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK44319

DRAWN E. LITZOW DATE 4-4-63

CHECKED Mel Kausler 22APR63

APPROVAL K. James

APPROVAL S. Rodel 22 APR 63

NASA APPROVAL W. S. Ewing 5/8/63

L. Gedeman 5/8/63

MIT APPROVAL W. Kupfer 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR, SIGNAL
ASSEMBLY

CODE IDENT NO. —— SIZE C 1900043

SCALE —— SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADDED: 1900004 TO APPLICATION BLOCK.		7 MAY 63	WK
B		REPLACED WITH CHANGE BY REVISION C 01521	MXC 186350	13 MAY 63	JHH / DR

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 **DATE** 8 May 63

Ⓑ REPLACED WITH CHANGE BY REV C

							TBA	SLIDES
				2			1900015-071	HANDLES
				1			1900022-011	GENERATOR
QUANTITY REQUIRED				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL ————
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44319
DRAWN E. LITZOW DATE 4-4-63
CHECKED Mele Kauster 22APR63
APPROVAL K James
APPROVAL Kodel 22 APR 63
NASA APPROVAL W. S. Swing 5/8/63
L. Gedeman 5/8/63
MIT APPROVAL W Kupfer 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR, SIGNAL
ASSEMBLY

CODE IDENT NO.
SIZE C
1900043
SCALE ——
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

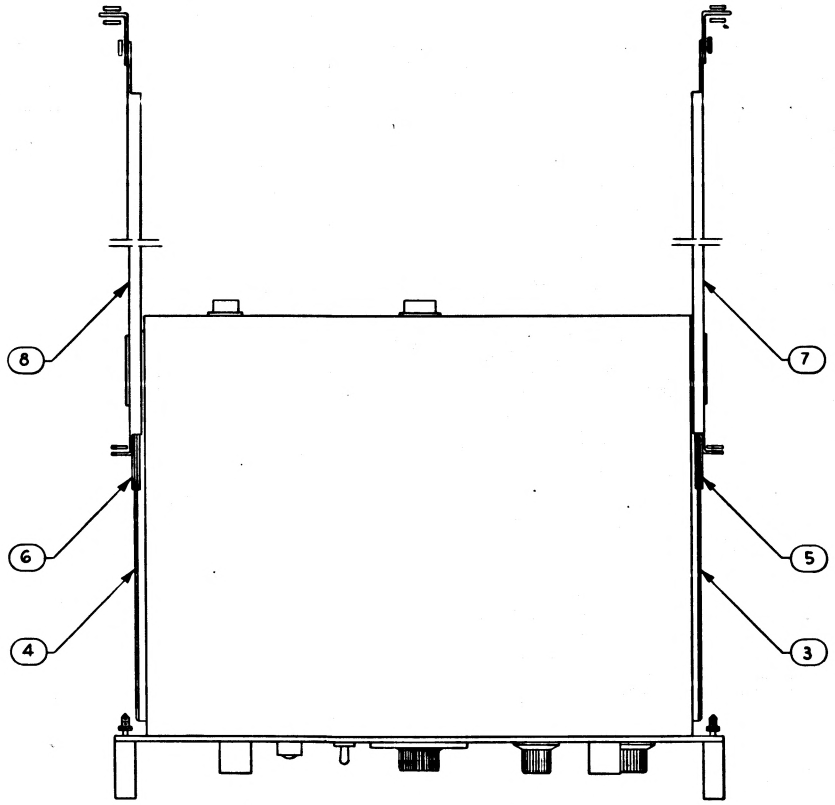
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS
PRESCRIBED BY MIL-D-70327.

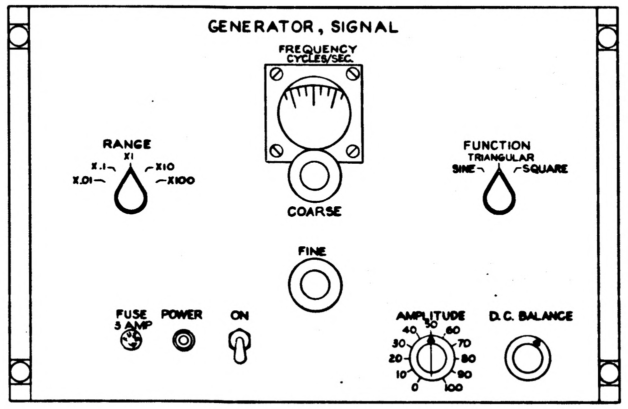
IDENTIFY USING DRAWING NO. AND REVISION LETTER PER
MIL-STD-130. (ES-267)

TORQUE ITEM (14) TO 37-40 INCH POUNDS AT INSTALLATION.

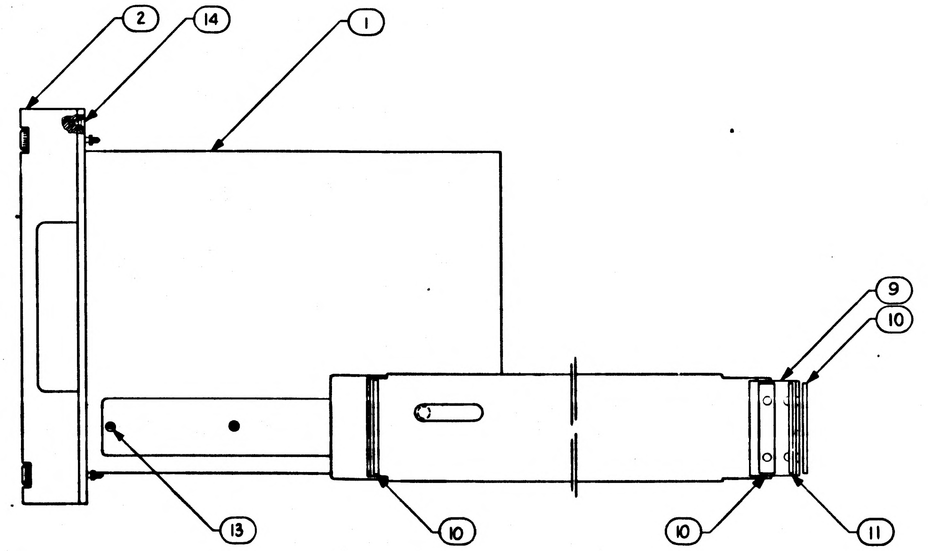
REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C2		(1) REPLACES REVISION B WITH CHANGE (2) REVISED AND REDRAWN PER MXC 186350	[illegible]	13 MAY 63	[illegible]





GENERATOR, SIGNAL
FREQUENCY
CYCLES/SEC.
COARSE
RANGE
X1
X.1
X10
X.01
X100
FUNCTION
TRIANGULAR
SINE
SQUARE
FINE
FUSE
3 AMP
POWER
ON
AMPLITUDE
0
10
20
30
40
50
60
70
80
90
100
D.C. BALANCE



2
14
1
9
10
13
10
10
11

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01521 DATE June 12, 1963

(C2) REPLACES REVISION B
WITH CHANGE

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			8		14	1015826-296	SCREW-FLAT HEAD, HEX SOCKET
			8		13	1015831-257	SCREW-FLAT HEAD, 100°, HEX SOCKET
			1		12		NAMEPLATE
			2		11	1015790-001	NUT-BAR
			6		10	1015796-001	SPACER, BAR
			2		9	1015795-001	BRACKET-ANGLE
			1		8	1015793-002	SLIDE-STATIONARY SECTION L.H.
			1		7	1015793-001	SLIDE-STATIONARY SECTION R.H.
			1		6	1015794-012	SLIDE-INTERMEDIATE SECTION L.H.
			1		5	1015794-011	SLIDE-INTERMEDIATE SECTION R.H.
			1		4	1015792-014	SLIDE-FRONT SECTION L.H.
			1		3	1015792-014	SLIDE-FRONT SECTION R.H.
			2		2	900015-071	HANDLE ASSEMBLY
			1		1	1900022-011	GENERATOR-SIGNAL

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALE KOWSKI 22 APR 63
APPROVAL K.R. JAMES 22 APR 63
APPROVAL 6-12-63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

GENERATOR, SIGNAL
ASSEMBLY

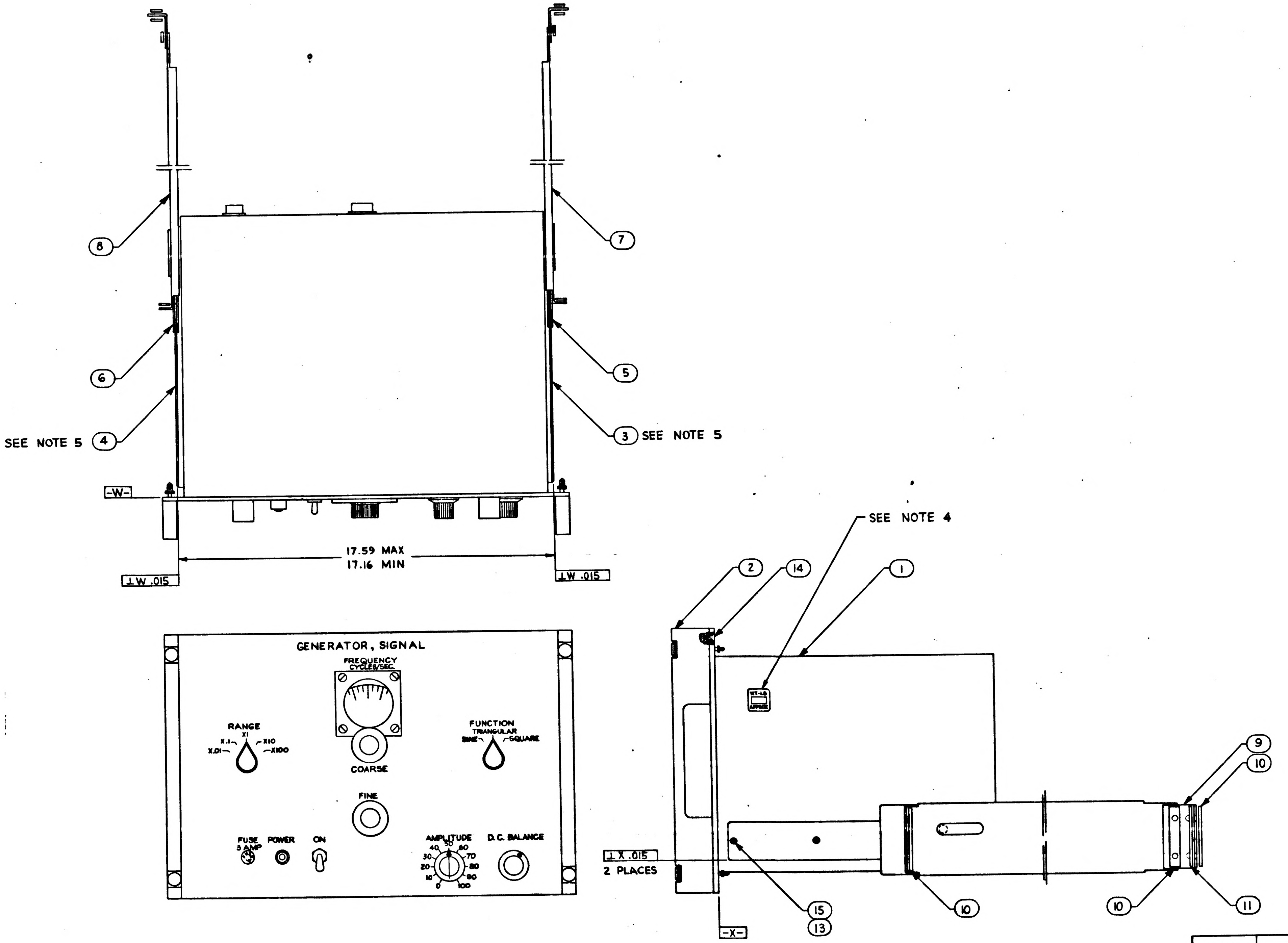
CODE IDENT NO
SIZE E
1900043
SCALE
SHEET

INCHES
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING NO. AND REVISION LETTER PER MIL-STD-130. (ES-267)
3. TORQUE ITEM (14) TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT PER ND 1002123 (37 LB)
5. SHIM TO FIT USING LAMINATED SHIM 1016005-1, QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C2		(1) REPLACES REVISION B WITH CHANGE (2) REVISED AND REDRAWN PER MXC 186350	TDRR	13 MAY 63	J.E.L. NARS
D		CHANGE IN ACCORDANCE WITH MXC 86469		2 AUG 63	
E		CHANGED IN ACCORDANCE WITH MXC-189582		4 SEP 63	RJM
F		CHANGE IN ACCORDANCE WITH MXC 191407 TDRR 04713		29 OCT 63	J.J.J.


8
7
6
5
SEE NOTE 5 4
3 SEE NOTE 5
-W-
17.59 MAX
17.16 MIN
⊥W .015
⊥W .015
GENERATOR, SIGNAL
FREQUENCY CYCLES/SEC.
RANGE
X1
X.1
X10
X.01
X100
COARSE
FUNCTION
TRIANGULAR
SINE
SQUARE
FINE
FUSE 5 AMP
POWER
ON
AMPLITUDE
0
10
20
30
40
50
60
70
80
90
100
D.C. BALANCE
SEE NOTE 4
2
14
1
9
10
⊥X .015
2 PLACES
15
13
10
10
11
-X-

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01521 **DATE** June 12, 1963

(C2) REPLACES REVISION B WITH CHANGE

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			4		16	AN535-00-4	(189710 9-004) SCREW, DRIVE
			8		15	1016005-1	SHIM, LAMINATED
			8		14	1015826-236	SCREW-FLAT HEAD, HEX SOCKET
			8		13	1015831-257	SCREW-FLAT HEAD, 100°, HEX SOCKET
			1		12	1900704	NAMEPLATE
			2		11	1015790-001	SPACER - BAR
			6		10	1015796-001	NUT - BAR
			2		9	1015795-001	BRACKET- REAR SUPPORT
			1		8	1015793-002	SLIDE-STATIONARY SECTION L.H.
			1		7	1015793-001	SLIDE-STATIONARY SECTION R.H.
			1		6	1015794-012	SLIDE-INTERMEDIATE SECTION L.H.
			1		5	1015794-011	SLIDE-INTERMEDIATE SECTION R.H.
			1		4	1015792-014	SLIDE-FRONT SECTION L.H.
			1		3	1015792-014	SLIDE-FRONT SECTION R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900022-011	GENERATOR-SIGNAL

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E.LITZOW DATE 4 APR 63
MALEKOWSKI 22 APR 63
CHECKED K.R. JAMES 22 APR 63
APPROVAL
APPROVAL L. Johnson 6-12-63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

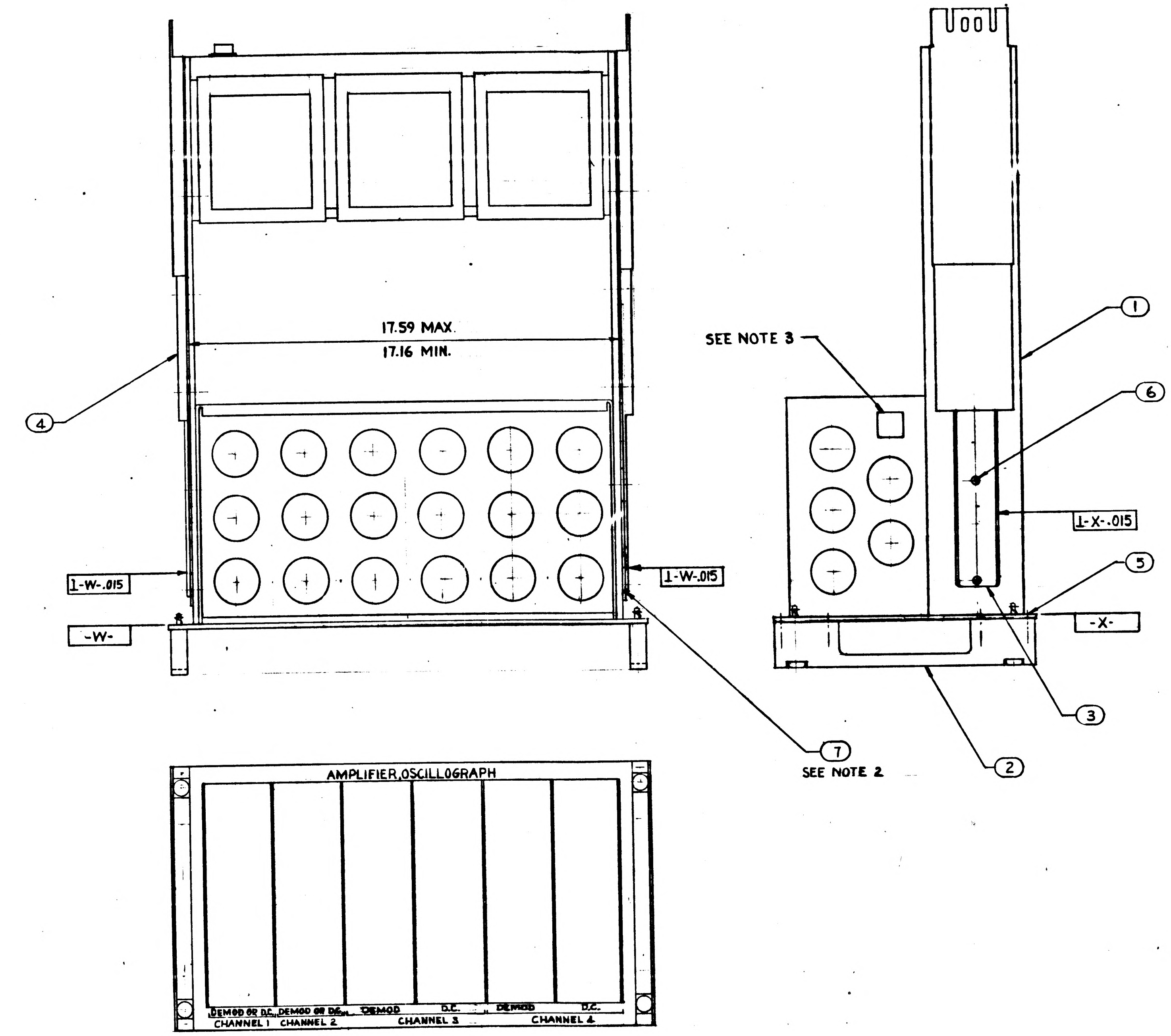
GENERATOR, SIGNAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900043
SCALE
SHEET 1

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SHIM TO FIT USING QUANTITY REQUIRED. PEEL OFF EXCESS SHIM STOCK, BOTH SIDES.
3. MARK WEIGHT (70 LB.) PER ND 1002123.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		REPLACED WITH CHANGE BY REVISION ~~PER~~ MXC 100470 DRR 02790		8 AUG 63	C.A.V.



17.59 MAX.
17.16 MIN.
4
1-W-.015
-W-
1-W-.015
7
SEE NOTE 2
SEE NOTE 3
1
6
1-X-.015
5
-X-
3
2
AMPLIFIER, OSCILLOGRAPH
DEMOD OR D.C.
DEMOD OR D.C.
DEMOD
D.C.
DEMOD
D.C.
CHANNEL 1
CHANNEL 2
CHANNEL 3
CHANNEL 4

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02790 DATE 28 Aug 63

Ⓑ REPLACES REV (A) WITH CHANGE

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			12		7	1016005-001	SHIM, LAMINATED
			10		6	1015826-296	SCREW, F.H., HEX. SOC.
			8		5	1015831-257	SCREW, F.H., HEX. SOC.
			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.
			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.
			2		2	1900015-061	HANDLE ASSY
			1		1	1900070-011	AMPLIFIER, OSCILLOGRAPH
QUANTITY REQUIRED			011	EFFECTIVITY		LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$\pm \frac{1}{64}$	$\pm .005$	$\pm .2°$

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 25 APR 63
APPROVAL
APPROVAL L. Gehman 8/27/63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900044
SCALE 1:2
SHEET OF

1900044 B

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION "B PER MXC 188470		8 AUG 63	C.A.M. / MEM
		TORR 02790			L.E.L

Ⓜ

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01209 **DATE** 8 May 63

Ⓐ REPLACED WITH CHANGE BY REV B

			10			1015826-296	SCREW, FH, HEX SOC
			8			1015831-257	SCREW, FH, HEX SOC
			1			1015791-010	CHASSIS, SLIDE ASSY LH
			1			1015791-009	CHASSIS, SLIDE ASSY RH
			2			1900015-061	HANDLE ASSY
			1			1900070-011	AMPLIFIER, OSCILLOGRAPH
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44449
DRAWN E. LITZOW DATE 4-4-63
CHECKED 25APR63
APPROVAL R. Rahn 25 Apr. 63
APPROVAL 25 APR 63
NASA APPROVAL 5/8/63
L. Goldman 5/8/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE C
1900044
SCALE
SHEET

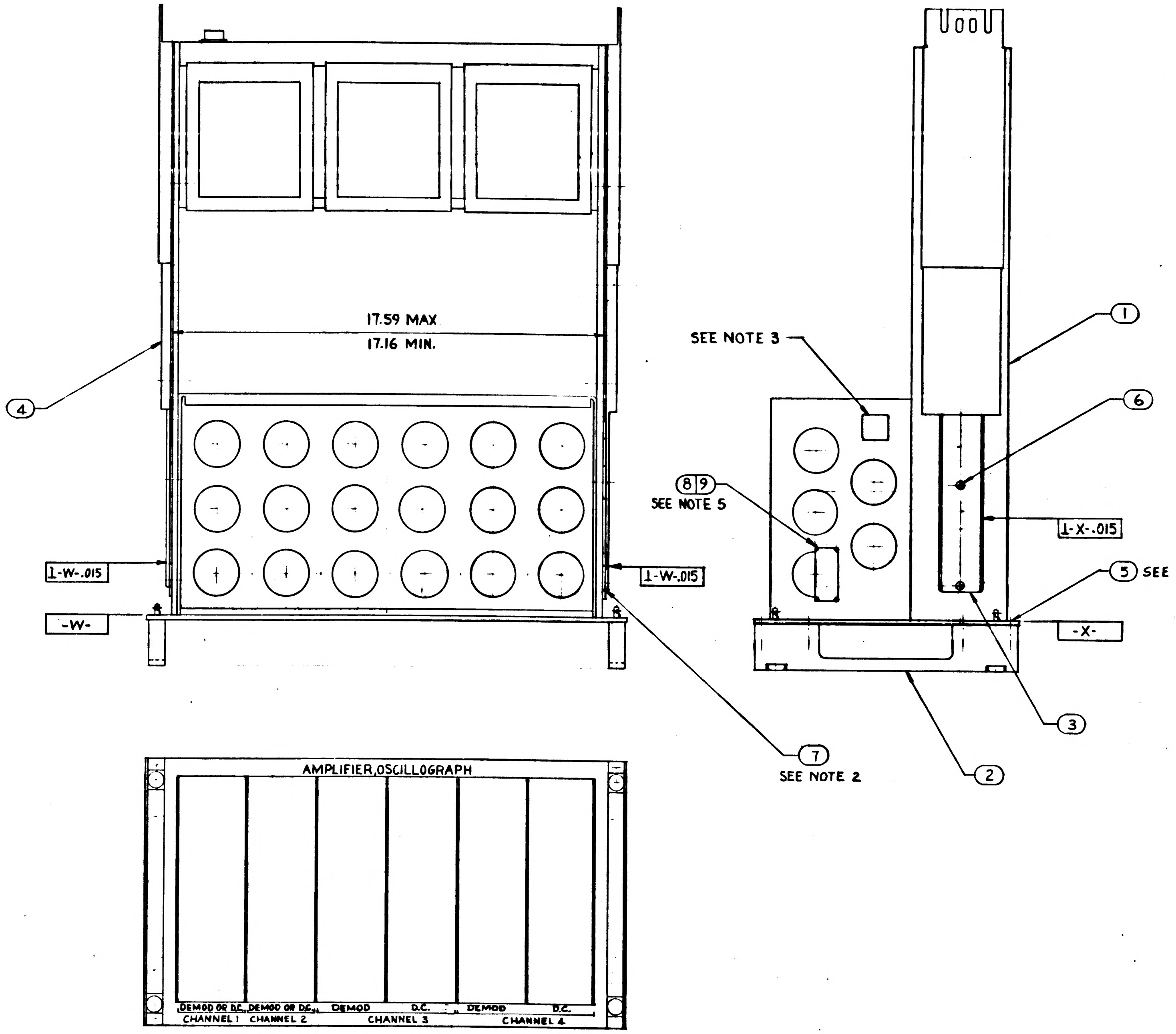
MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SHIM TO FIT USING QUANTITY REQUIRED. PEEL OFF EXCESS SHIM STOCK, BOTH SIDES.
3. MARK WEIGHT (70 LB.) PER ND 1002123.
4. SERIALIZE PER ND 1002023
5. MARK APPLICABLE CONT. NO. & SERIAL NO. ON ITEM 8 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
6. SECURE SCREWS USING ITEM 10

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
Ⓜ B		REPLACED WITH CHANGE BY REVISION PER MXC 188470		8 AUG 63	C.A.M. MEM
C		CHANGE IN ACCORDANCE WITH MXC 19.407 PER TDRR 08213		29 OCT 63	J.J.
D		CHANGE IN ACCORDANCE WITH CM-192887. PER TDRR 08214		26 DEC 63	RJM
E		CHANGE IN ACCORDANCE WITH CM194140 PER TDRR 08215		16 JAN 64	GG



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ____ DATE 28 ____

Ⓑ REPLACES REV (A) WITH CHANGE

			AR		10	MIL-S-40093-C130	(ES 2544-5) SEALING COMPOUND
			4		9	AN535-00-4	(1897?9-004) SCREW, DRIVE
			1		8	1901304-126	NAMEPLATE
			12		7	1016005-001	SHIM, LAMINATED
			10		6	1015826-300	SCREW, F.H., HEX. SOC.
			8		5	1015831-253	SCREW, F.H., HEX. SOC.
			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.
			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.
			2		2	1900015-061	HANDLE ASSY
			1		1	1900070-011	AMPLIFIER, OSCILLOGRAPH
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900000	1900060	011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
$+\frac{1}{64}$	+.005	+.2°
$-\frac{1}{64}$	−.005	−.2°

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 25 APR 63
APPROVAL
APPROVAL L. Gehman 8/27/63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER OSCILLOGRAPH
ASSEMBLY

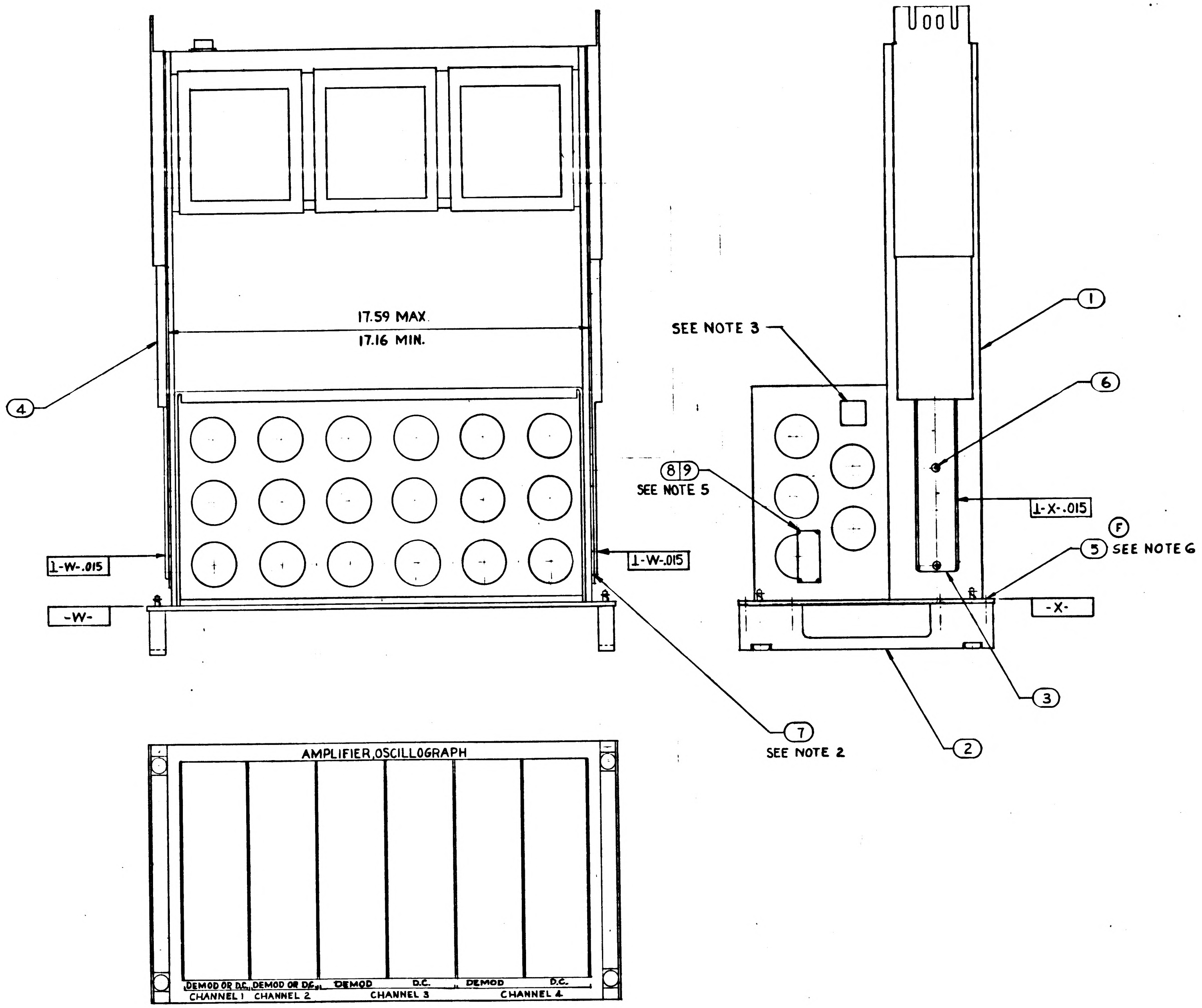
CODE IDENT NO. | SIZE E | 1900044

SCALE 1:2 | SHEET 1 OF 1

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SHIM TO FIT USING QUANTITY REQUIRED. PEEL OFF EXCESS SHIM STOCK, BOTH SIDES.
3. MARK WEIGHT (70 LB.) PER ND 1002123.
4. SERIALIZE PER ND 1002023
5. MARK APPLICABLE CONT. NO. & SERIAL NO. ON ITEM 8 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
6. SECURE SCREWS USING ITEM 10

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
Ⓜ B		REPLACED WITH CHANGE BY REVISION PER MXC 188470 TDRR 02790		8 AUG 63	C.A.M.
C		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 08213		29 OCT 63	J.J.J.
D		CHANGE IN ACCORDANCE WITH CM-192887. PER TDRR 08214		26 DEC 63	RJM
Ⓜ E		CHANGE IN ACCORDANCE WITH CM 194140 PER TDRR 08215		16 JAN 64	GG
F		REVISED PER TDRR 10873		17 JUL 64	RJF



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02790 DATE 28 Aug 63

Ⓑ REPLACES REV (A) WITH CHANGE

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
AR		10	MIL-S-40083-C130	(ES-2594-5) SEALING COMPOUND
4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
1		8	1901304-126	NAMEPLATE
12		7	1016005-001	SHIM, LAMINATED
10		6	1015826-300	SCREW FH HEX. SOC.
8		5	AN507C832R12	(1897003-568) SCREW, FLAT HD.
1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.
1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.
2		2	1900015-061	HANDLE ASSY
1		1	1900070-011	AMPLIFIER, OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±.2°
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN G. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 25 APR 63
APPROVAL
APPROVAL L Gehman 8/27/63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER OSCILLOGRAPH
ASSEMBLY

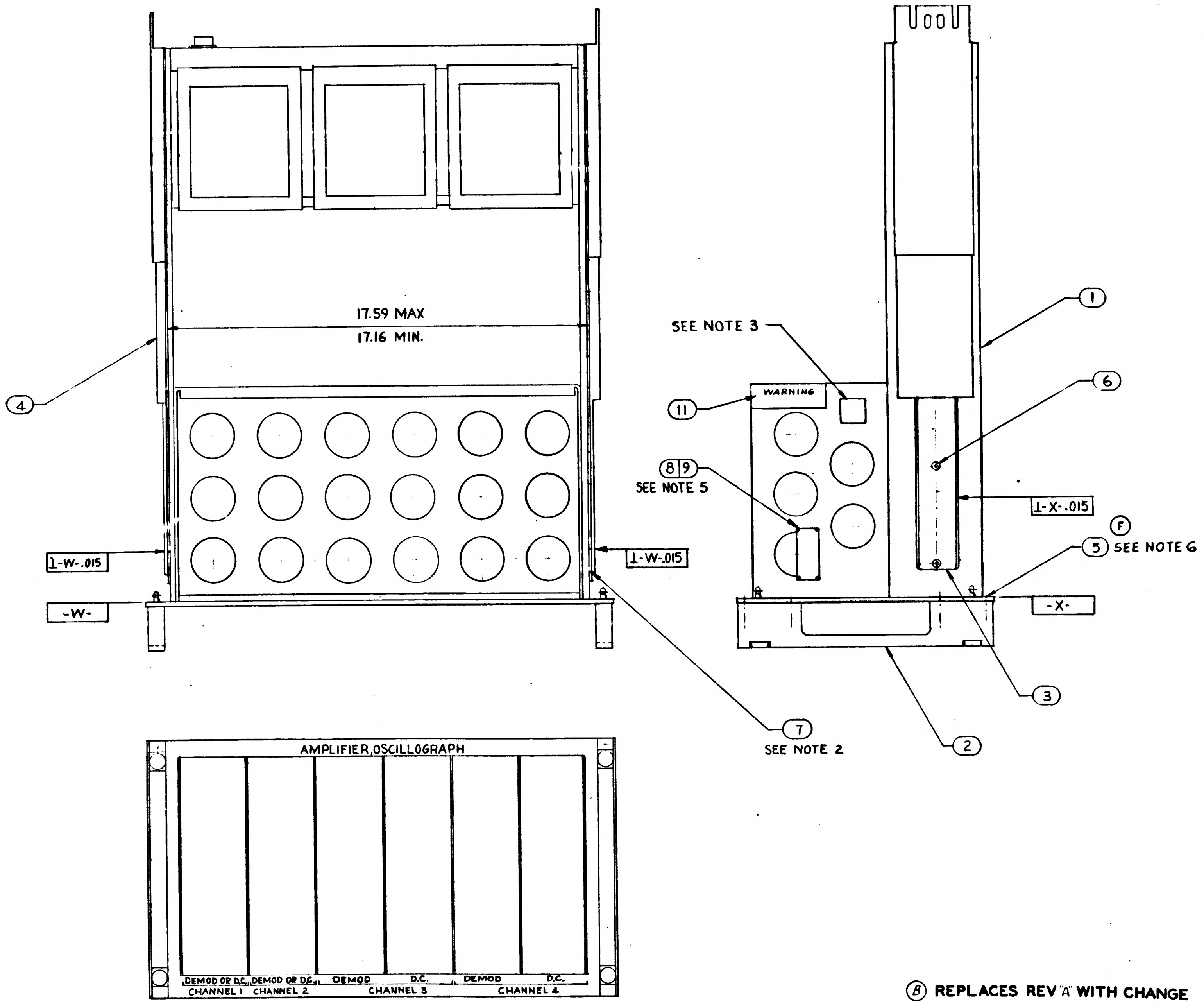
CODE IDENT NO. SIZE E 1900044
SCALE 1:2 SHEET 1 OF 1

1900044 F

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SHIM TO FIT USING QUANTITY REQUIRED. PEEL OFF EXCESS SHIM STOCK, BOTH SIDES.
3. MARK WEIGHT (70 LB.) PER ND 1002123.
4. SERIALIZE PER ND 1002023
5. MARK APPLICABLE CONT. NO. & SERIAL NO. ON ITEM 8 IN ACCORDANCE WITH ND1002023. LETTERS & NUMERALS TO BE .06 HIGH.
6. SECURE SCREWS USING ITEM 10

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
Ⓜ B		REPLACED WITH CHANGE BY REVISION PER MXC 158470 TDRR 03390		8 AUG 63	C.A.M. MEM
C		CHANGE IN ACCORDANCE WITH MXC 19140T PER TDRR 08213		29 OCT 63	J.J.
D		CHANGE IN ACCORDANCE WITH CM-192887. PER TDRR 08214		26 DEC 63	RJM
Ⓜ E		CHANGE IN ACCORDANCE WITH CM194140 PER TDRR 08215		16 JAN 64	GG
Ⓜ F		REVISED PER TDRR 10873		JUL 64	
G		REVISED PER TDRR 11391		3 AUG 64	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02790 DATE 28 Aug 63

Ⓑ REPLACES REV 'A' WITH CHANGE

			1		11	1900953-002	PLATE, INSTRUCTION
			AR		10	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
			4		9	AN535-00-4	(1897109-004) SCREW, DRIVE
			1		8	1901304-126	NAMEPLATE
			12		7	1016005-001	SHIM, LAMINATED
			10		6	1015826-300	SCREW F.H. HEX. SOC.
			8		5	AN507C832R12	(1897003-568) SCREW, FLAT HD.
			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.
			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.
			2		2	1900015-061	HANDLE ASSY
			1		1	1900070-011	AMPLIFIER, OSCILLOGRAPH
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900000	1900000	011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ±.2°
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN G. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 25 APR 63
APPROVAL
APPROVAL L Gehman 7/29/63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO. | SIZE E | 1900044
SCALE 1:2 | SHEET 1 OF 1

1900044 G

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01209 DATE 8 May 63

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			10			1015826-296	SCREW, FH, HEX SOC
			8			1015831-257	SCREW, FH, HEX SOC
			1			1015791-010	CHASSIS, SLIDE ASSY LH
			1			1015791-009	CHASSIS, SLIDE ASSY RH
			2			1900015-061	HANDLE ASSY
			1			1900070-011	AMPLIFIER, OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ —	+ —
– —	– —	– —

DO NOT SCALE THIS DRAWING

MATERIAL ——

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP P/N SK44449

DRAWN E. LITZOW DATE 4-4-63
25APR63
CHECKED
APPROVAL R. Rahn 25 Apr. 63
APPROVAL 25 APR 63
NASA APPROVAL 5/8/63
L. Goldman 5/8/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE C
1900044

SCALE ——
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED	D.O.51560	15-MAY-63	A.J.F. RWH

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 **DATE** 5 June 63

LIST OF PARTS AND MATERIALS

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1				NAMEPLATE
				10			1015826-296	SCREW, F.H. HEX SOC
				8			1015831-257	SCREW, F.H. HEX SOC
				1			1015791-010	CHASSIS, SLIDE ASSEMBLY L.H.
				1			1015791-009	CHASSIS, SLIDE ASSEMBLY R.H.
				2			1900015-061	HANDLE ASSEMBLY
				1			1900071	AMPLIFIER, OSCILLOGRAPH

QUANTITY REQUIRED

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44450
DRAWN E.LITZOW DATE 4-4-63
CHECKED Hogue 15 MAY 63
APPROVAL R. Rahn May 15, 1963
APPROVAL 15 MAY 63
NASA APPROVAL
MIT APPROVAL 6/4/63 5 June 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE C 1900045
SCALE
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900045 B

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REVISED	D.O.51560	15-MAY-63	A.J.F. RWH
B		REPLACED WITH CHANGE BY REV C PER MXC 188471		7-OCT-63	A.J.W.
		REVISED PER TDR 04287		30 Oct 63	W.K.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 Jun 63

Ⓑ REPLACED WITH CHANGE BY REV C

			1		7		NAMEPLATE
			10		6	1015826-296	SCREW, F.H. HEX SOC
			8		5	1015831-257	SCREW, F.H. HEX SOC
			1		4	1015791-010	CHASSIS, SLIDE ASSEMBLY L.H.
			1		3	1015791-009	CHASSIS, SLIDE ASSEMBLY R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900071	AMPLIFIER, OSCILLOGRAPH
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44450
DRAWN E. LITZOW DATE 4-4-63
CHECKED Hogue 15 MAY 63
APPROVAL R. Rahn May 15, 1963
APPROVAL 15 MAY 63
NASA APPROVAL
MIT APPROVAL L. Gebhardt 6/4/63 5 Jun 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE C
1900045
SCALE
SHEET

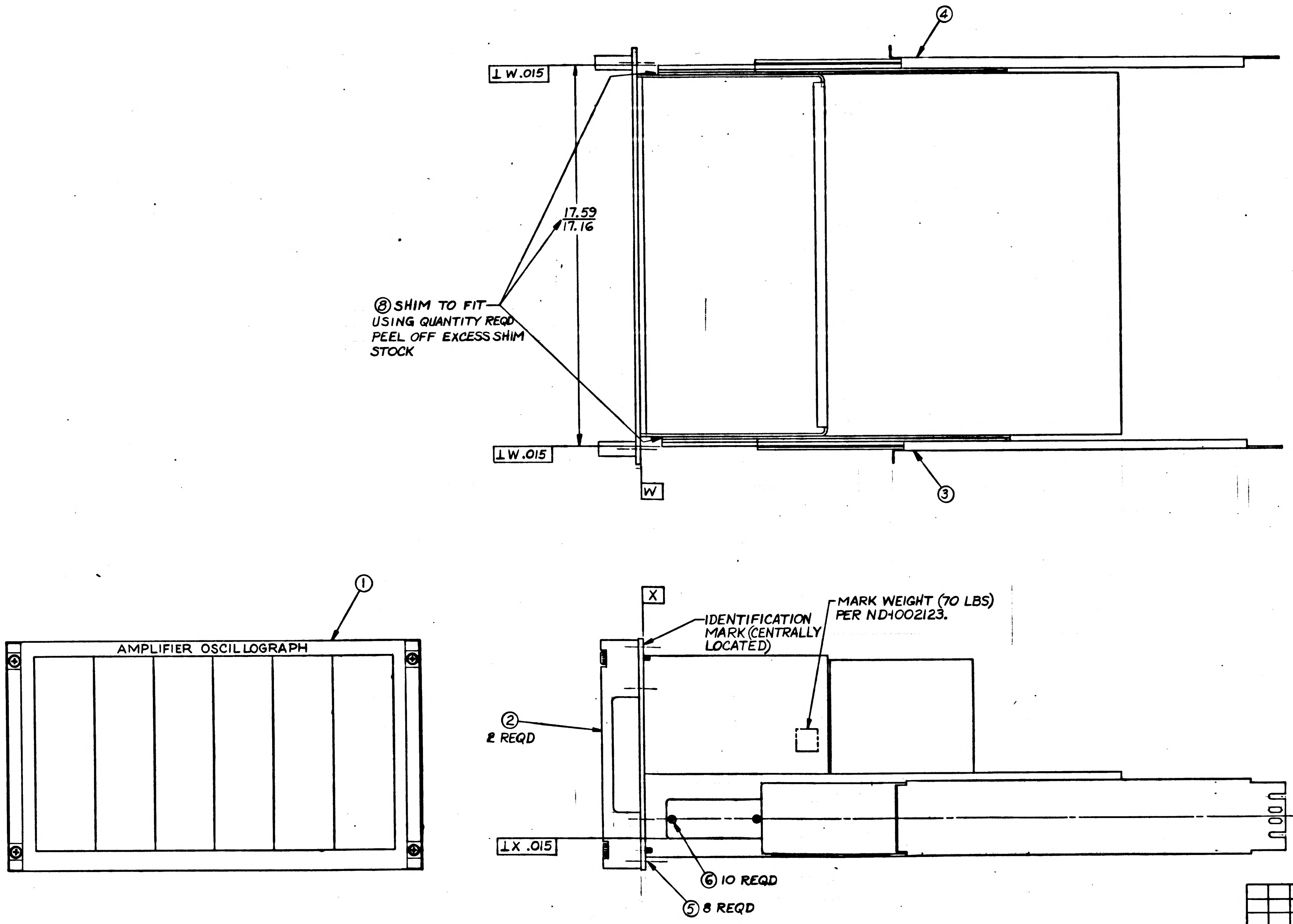
MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		REPLACES REV B WITH CHANGE PER MXC-188471 REVISED PER TDR [illegible]		7-OCT-63 30 [illegible]	[illegible] V7-63 WK.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING PART NO. PREFIXED BY "ASSY" WITH APPLICABLE DASH NO. AND REVISION LETTER PER MIL-STD-130 (ES-267).
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.



④
⊥ W .015
17.59
17.16
⑧ SHIM TO FIT USING QUANTITY REQD PEEL OFF EXCESS SHIM STOCK
⊥ W .015
W
③
①
AMPLIFIER OSCILLOGRAPH
X
IDENTIFICATION MARK (CENTRALLY LOCATED)
MARK WEIGHT (70 LBS) PER ND1002123.
② 2 REQD
⊥ X .015
⑥ 10 REQD
⑤ 8 REQD

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE

SEE NOTE 3
SEE NOTE 3

ⓒ REPLACES REV (B) WITH CHANGE

			12		8	1016005-1	SHIM, LAMINATED	
			1		7		NAMEPLATE	
			10		6	1015826-296	SCREW, F.H. HEX. SOC.	
			8		5	1015831-257	SCREW, F.H. HEX. SOC.	
			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.	SEE NOTE 3
			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.	SEE NOTE 3
			2		2	1900015-061	HANDLE ASSEMBLY	
			1		1	1900071	AMPLIFIER, OSCILLOGRAPH	
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS			

1900000	1900000	011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS +.005 −.02 ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44450
DRAWN E. LITZOW DATE 4-APR-63
CHECKED HOGUE 15-MAY-63
APPROVAL R. RAHN 15-MAY-63
APPROVAL [illegible] /63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

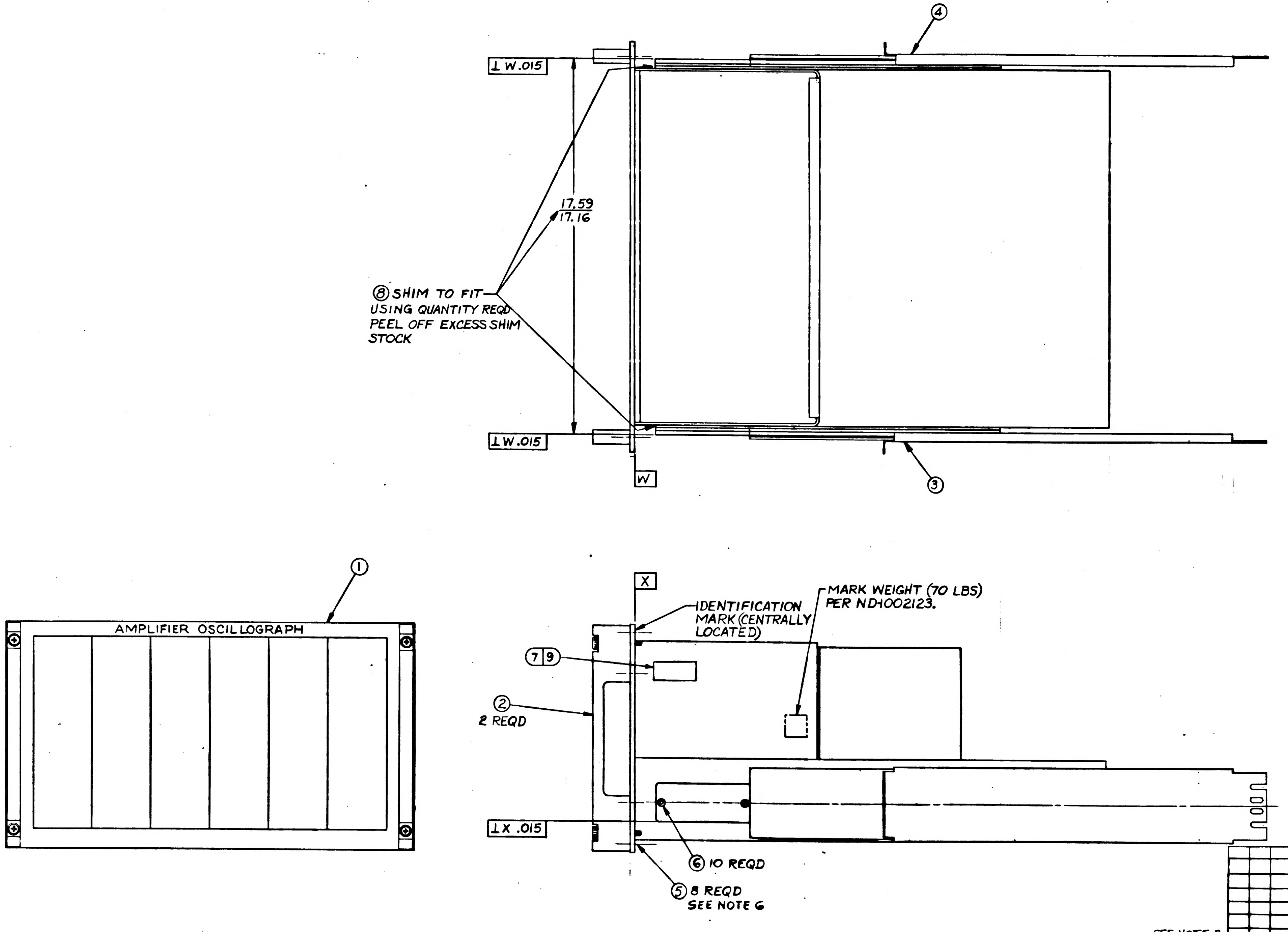
CODE IDENT NO.
SIZE E
1900045
SCALE 1:2
SHEET OF

1900045 C

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING PART NO. PREFIXED BY "ASSY" WITH APPLICABLE DASH NO. AND REVISION LETTER PER MIL-STD-130 (ES-267).
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
4. SERIALIZE PER ND 1002023
5. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 7 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
6. SECURE SCREWS USING ITEM 10

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		REPLACES REV B WITH CHANGE PER MXC-188471 REVISED PER TDR 04227		7-OCT-63	
D		CHANGE IN ACCORDANCE WITH MXC 91407 PER TDRR 08120		21 NOV 63	SH
E		CHANGE IN ACCORDANCE WITH CM 92888 PER TDRR 08191		17 DEC 63	JEC
F		CHANGE IN ACCORDANCE WITH CM 94141 PER TDRR 08192		16 JAN 64	GG


④
⊥W.015
17.59
17.16
⑧ SHIM TO FIT USING QUANTITY REQD PEEL OFF EXCESS SHIM STOCK
⊥W.015
W
③
①
AMPLIFIER OSCILLOGRAPH
X
IDENTIFICATION MARK (CENTRALLY LOCATED)
MARK WEIGHT (70 LBS) PER ND1002123.
⑦⑨
②
2 REQD
⊥X .015
⑥ 10 REQD
⑤ 8 REQD
SEE NOTE 6

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0176 DATE

© REPLACES REV(B) WITH CHANGE

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			AR		10	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
			4		9	AN535-00-4	SCREW, DRIVE (1897109-004)
			12		8	1016005-1	SHIM, LAMINATED
			1		7	1901304-127	NAMEPLATE
			10		6	1015826-300	SCREW, F.H. HEX. SOC.
			8		5	1015831-253	SCREW, F.H. HEX. SOC.
			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.
			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900071	AMPLIFIER, OSCILLOGRAPH
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

SEE NOTE 3 (item 4)
SEE NOTE 3 (item 3)

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS +.005 −.02
ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44450
DRAWN E. LITZOW DATE 4-APR-63
CHECKED HOGUE 15-MAY-63
APPROVAL R. RAHN 15-MAY-63
APPROVAL
NASA APPROVAL
MIT APPROVAL 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

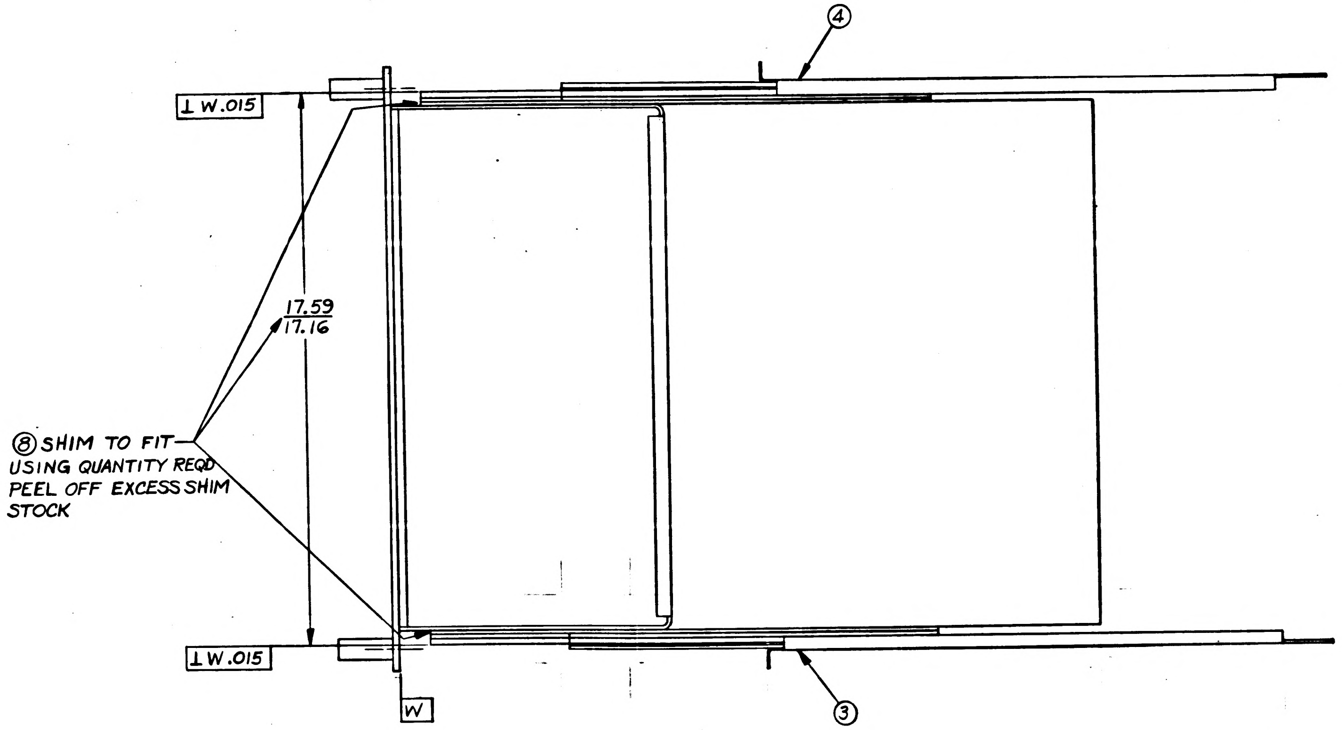
AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900045
SCALE 1:2
SHEET 1 OF 1

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING PART NO. PREFIXED BY "ASSY" WITH APPLICABLE DASH NO. AND REVISION LETTER PER MIL-STD-130(ES-267).
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
4. SERIALIZE PER ND 1002023
5. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 7 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
6. SECURE SCREWS USING ITEM 10

REVISIONS

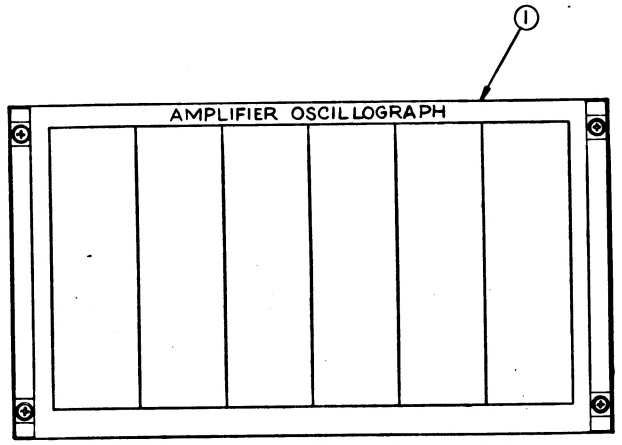
	SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓒ	C		REPLACES REV B WITH CHANGE PER MXC-188471		7-OCT-63	V7-63
			REVISED PER TDR 04287		30 [illegible] 63	WK
	D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 08120		21 NOV 63	SH
	E		CHANGE IN ACCORDANCE WITH CM 192888 PER TDRR 08191		17 DEC 63	JEC
Ⓜ	F		CHANGE IN ACCORDANCE WITH CM 194141 PER TDRR 08192		16 JAN 64	GG
	G		REVISED PER TDRR 10212		29 JAN 64	JWP



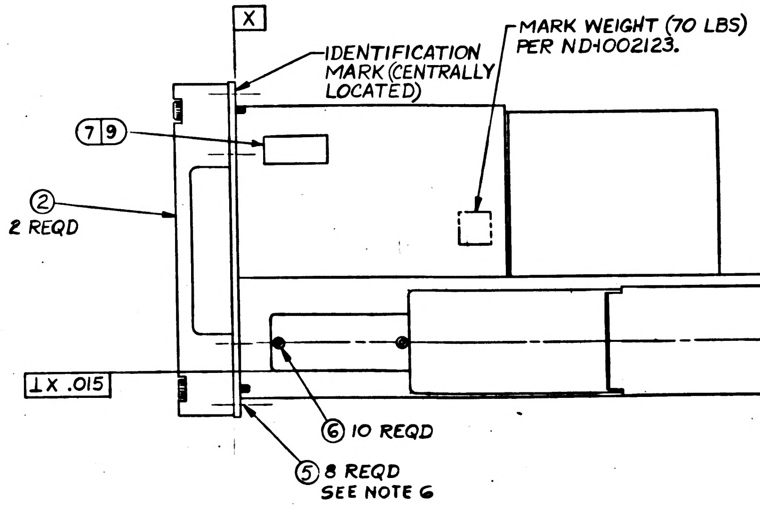
④
⊥W.015
17.59
17.16
⑧ SHIM TO FIT USING QUANTITY REQD PEEL OFF EXCESS SHIM STOCK
⊥W.015
W
③

FOR INFORMATION ONLY

CLASS B "RELEASE" TDR No. 01466 DATE



①
AMPLIFIER OSCILLOGRAPH



X
IDENTIFICATION MARK (CENTRALLY LOCATED)
MARK WEIGHT (70 LBS) PER ND1002123.
⑦⑨
②
2 REQD
⊥X.015
⑥ 10 REQD
⑤ 8 REQD SEE NOTE 6

SEE NOTE 3

SEE NOTE 3

Ⓒ REPLACES REV(B) WITH CHANGE

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			AR		10	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
			4		9	AN535-00-4	SCREW, DRIVE (1897109-004)
			12		8	1016005-1	SHIM, LAMINATED
			1		7	1901304-127	NAMEPLATE
			10		6	1015826-300	SCREW, F.H. HEX. SOC.
			8		5	1015831-253	SCREW, F.H. HEX. SOC.
			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.
			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900071-011	AMPLIFIER, OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS +.005 −.02 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44450
DRAWN E. LITZOW DATE 4-APR-63
CHECKED HOGUE 15-MAY-63
APPROVAL R. RAHN 15-MAY-63
APPROVAL [illegible] 16/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

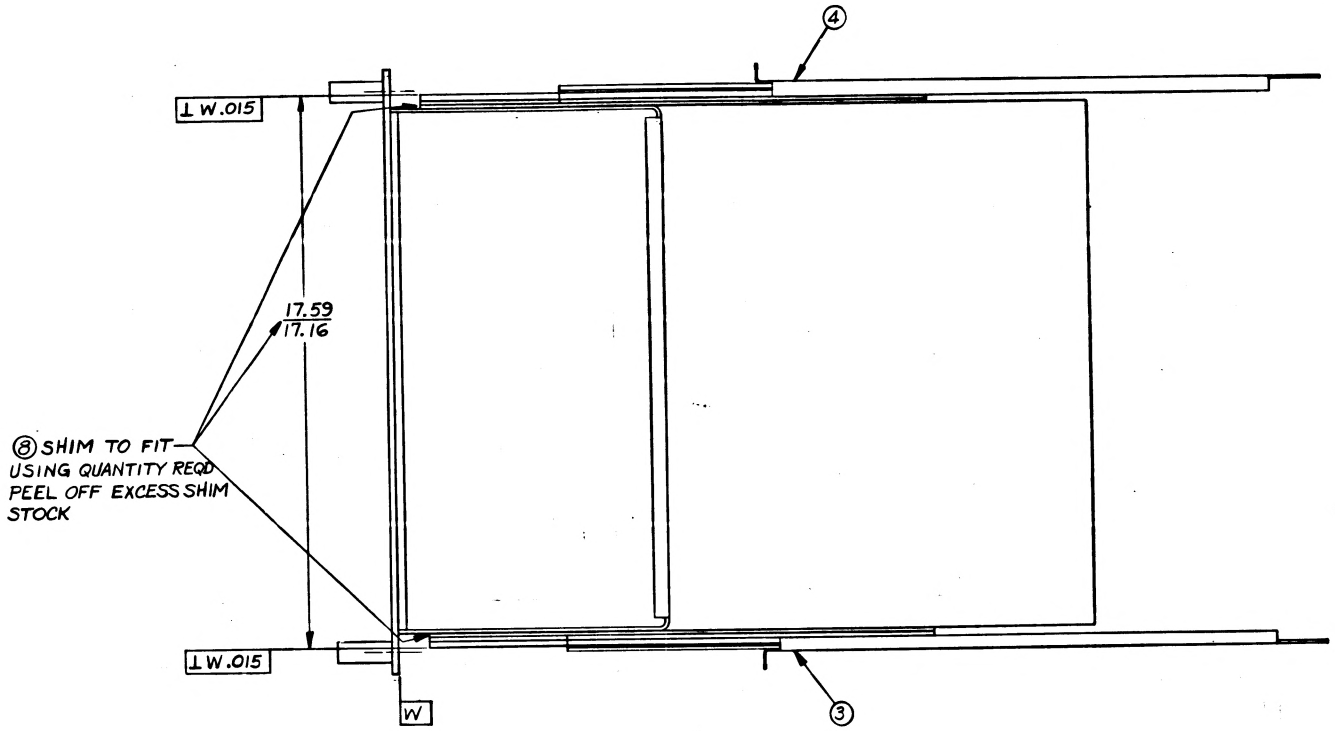
AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

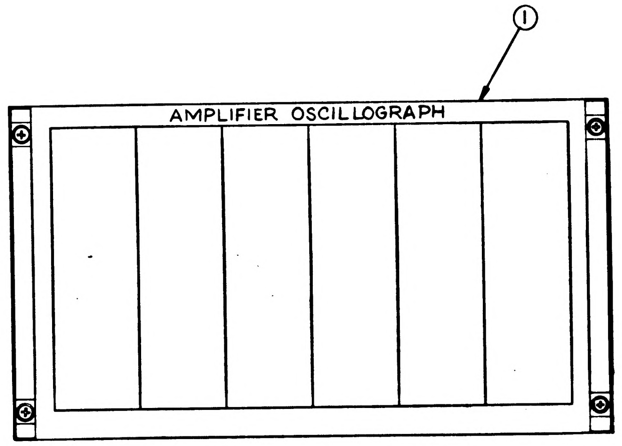
CODE IDENT NO.
SIZE E
1900045
SCALE 1:2
SHEET 1 OF 1

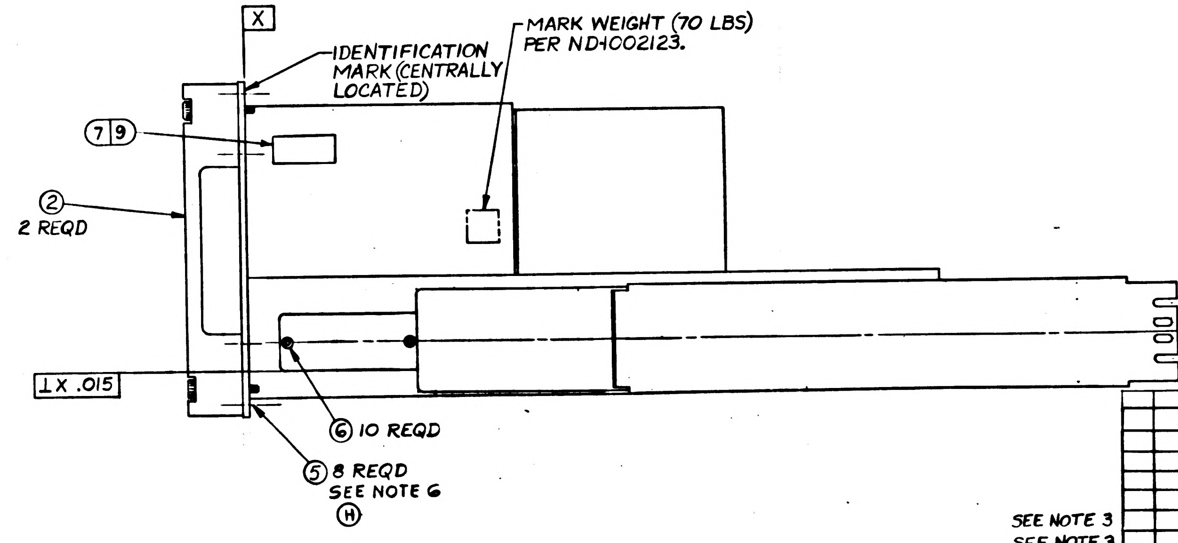
1900045 G

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		REPLACES REV B WITH CHANGE PER MXC-188471 REVISED PER TDR 04127		7-OCT-63 30 [illegible] 63	[illegible] WK
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 08120		21 NOV 63	SH EJW
E		CHANGE IN ACCORDANCE WITH CM 192888 PER TDRR 08191		17 DEC 63	JA JEC
F		CHANGE IN ACCORDANCE WITH CM194141 PER TDRR 08192		16 JAN 64	GG
G		REVISED PER TDRR 10212		29 JAN 64	JWP
H		REVISED PER TDRR 10873		17 JUL 64	RJF

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING PART NO. PREFIXED BY "ASSY" WITH APPLICABLE DASH NO. AND REVISION LETTER PER MIL-STD-130(ES-267).
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
4. SERIALIZE PER ND 1002023
5. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 7 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
6. SECURE SCREWS USING ITEM 10


④
⊥W.015
17.59
17.16
⑧ SHIM TO FIT USING QUANTITY REQD PEEL OFF EXCESS SHIM STOCK
⊥W.015
W
③


①
AMPLIFIER OSCILLOGRAPH


X
IDENTIFICATION MARK (CENTRALLY LOCATED)
MARK WEIGHT (70 LBS) PER ND1002123.
7 9
②
2 REQD
⊥X .015
⑥ 10 REQD
⑤ 8 REQD
SEE NOTE 6

FOR INFORMATION ONLY

CLASS 3 RELEASE TDR No. 01466 4-63 DATE

ⓒ REPLACES REV(B) WITH CHANGE

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION	
			AR		10	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND	
			4		9	AN535-00-4	SCREW, DRIVE (1897109-004)	
			12		8	1016005-1	SHIM, LAMINATED	
			1		7	1901304-127	NAMEPLATE	
			10		6	1015826-300	SCREW, F.H. HEX. SOC.	
			8		5	AN507C832R12	(1897003-568) SCREW, FLAT HD	
			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.	SEE NOTE 3
			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.	SEE NOTE 3
			2		2	1900015-061	HANDLE ASSEMBLY	
			1		1	1900071-011	AMPLIFIER, OSCILLOGRAPH	

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS +.005 −.02 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44450
DRAWN E. LITZOW DATE 4-APR-63
CHECKED HOGUE 15-MAY-63
APPROVAL R. RAHN 15-MAY-63
APPROVAL [illegible] 5/28/63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible] 30 Oct 63

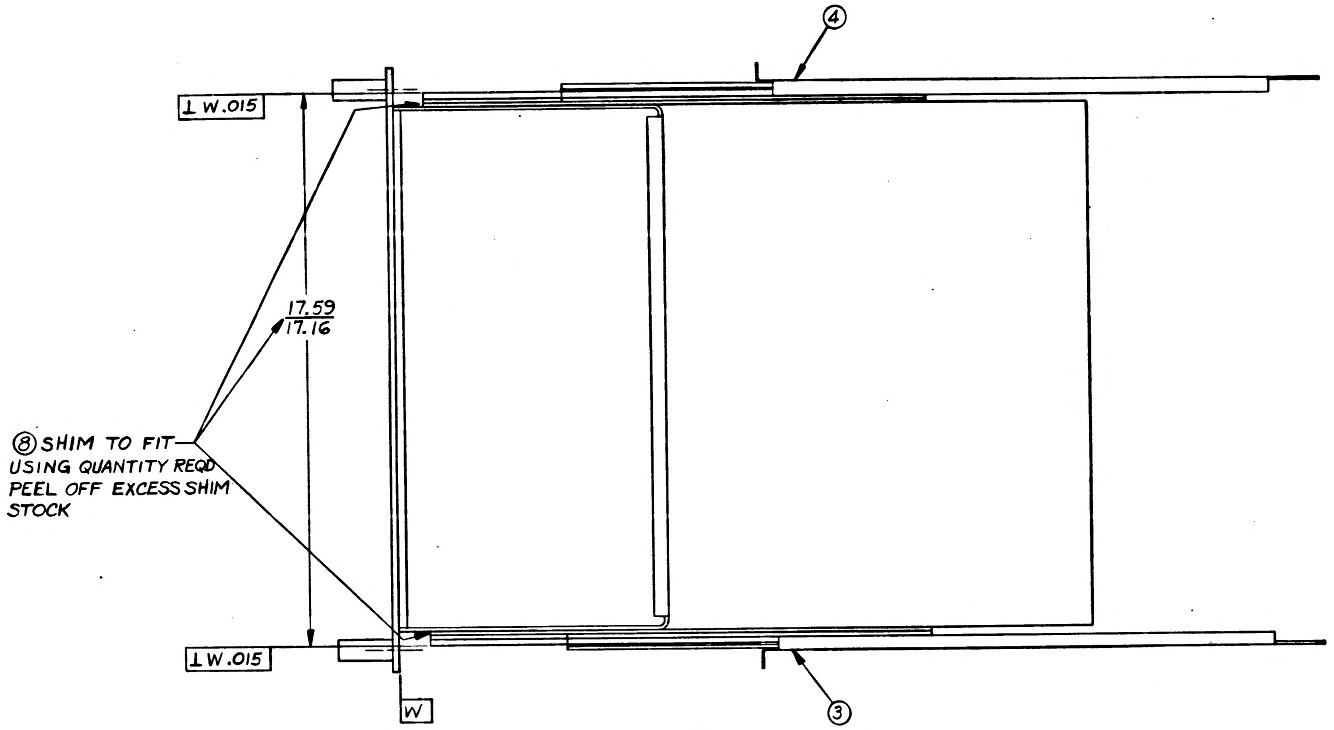
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900045
SCALE 1:2
SHEET OF

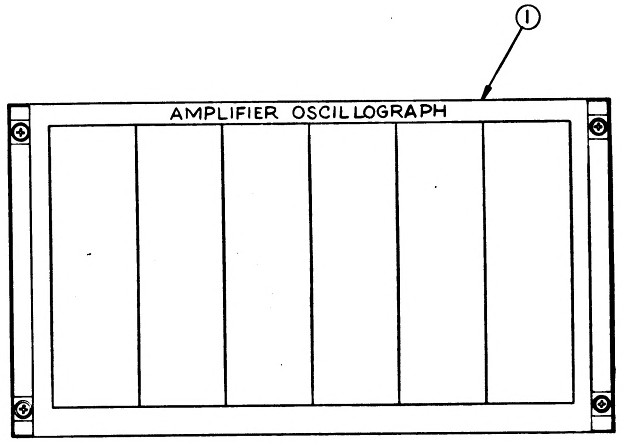
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		REPLACES REV B WITH CHANGE PER MXC-188471 REVISED PER TDR 04227		7-OCT-63 30 OCT 63	W.K.
D		CHANGE IN ACCORDANCE WITH MXC 191407 PER TDR 08120		21 NOV 63	SH
E		CHANGE IN ACCORDANCE WITH CM 192888 PER TDRR 08191		17 DEC 63	JEC
F		CHANGE IN ACCORDANCE WITH CM 194141 PER TDRR 08192		16 JAN 64	GG
G		REVISED PER TDRR 10212		29 Jan 64	JWP
H		REVISED PER TDRR 10873		17 JUL 64	RJF
J		REVISED PER TDRR 11401		13 AUG 64	JWP

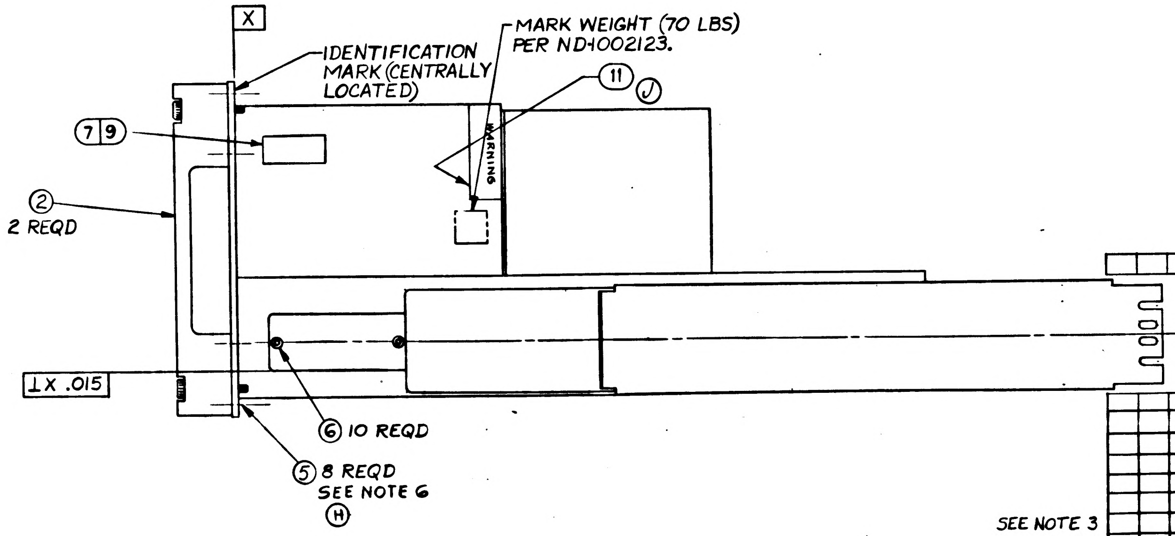
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING PART NO. PREFIXED BY "ASSY" WITH APPLICABLE DASH NO. AND REVISION LETTER PER MIL-STD-130 (ES-267).
3. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
4. SERIALIZE PER ND 1002023
5. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM 7 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
6. SECURE SCREWS USING ITEM 10


④
⊥W.015
17.59
17.16
⑧ SHIM TO FIT USING QUANTITY REQD PEEL OFF EXCESS SHIM STOCK
⊥W.015
W
③

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE


①
AMPLIFIER OSCILLOGRAPH


X
IDENTIFICATION MARK (CENTRALLY LOCATED)
MARK WEIGHT (70 LBS) PER ND 1002123.
⑪ Ⓙ
WARNING
⑦⑨
② 2 REQD
⊥X .015
⑥ 10 REQD
⑤ 8 REQD SEE NOTE 6 Ⓗ

Ⓒ REPLACES REV (B) WITH CHANGE

			1		11	1900953-002	PLATE, INSTRUCTION
			AR		10	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
			4		9	AN535-00-4	SCREW, DRIVE (1897109-004)
			12		8	1016005-1	SHIM, LAMINATED
			1		7	1901304-127	NAMEPLATE
			10		6	1015826-300	SCREW, F.H. HEX. SOC.
			8		5	AN507C832R12	(1897003-568) SCREW, FLAT HD
SEE NOTE 3			1		4	1015791-010	CHASSIS, SLIDE ASSY L.H.
SEE NOTE 3			1		3	1015791-009	CHASSIS, SLIDE ASSY R.H.
			2		2	1900015-061	HANDLE ASSEMBLY
			1		1	1900071-011	AMPLIFIER, OSCILLOGRAPH
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS +.005 −.02
ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44450
DRAWN E. LITZOW DATE 4-APR-63
CHECKED HOGUE 15-MAY-63
APPROVAL R. RAHN 15-MAY-63
APPROVAL
NASA APPROVAL
MIT APPROVAL 30 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AMPLIFIER, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900045
SCALE 1:2
SHEET 1 OF 1

1900045 J

(M)

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHG. BY REV. "B" PER MXC 186822 TDBR 02791		6 AUG 63	SXP

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01209 **DATE** 8 May 63

REPLACED WITH CHANGE BY REV B

QUANTITY REQUIRED					EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			4				1015831-257	SCREW, F H, HEX SOC
			2				1900015-021	HANDLE ASSY
			1				1900072-011	CONTROL, OSCILLOGRAPH
			011					

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
- — - — - —
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44451
DRAWN E. LITZOW DATE 4-4-63
Mal Kaurla 25 APR 63
CHECKED
APPROVAL R. Rahn Apr 25, 1963
APPROVAL A.P. Kodel 25 APR 63
NASA APPROVAL 5/8/63
L. Gedeman 5/8/63
MIT APPROVAL W. Kupfer 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE C
1900046
SCALE —
SHEET

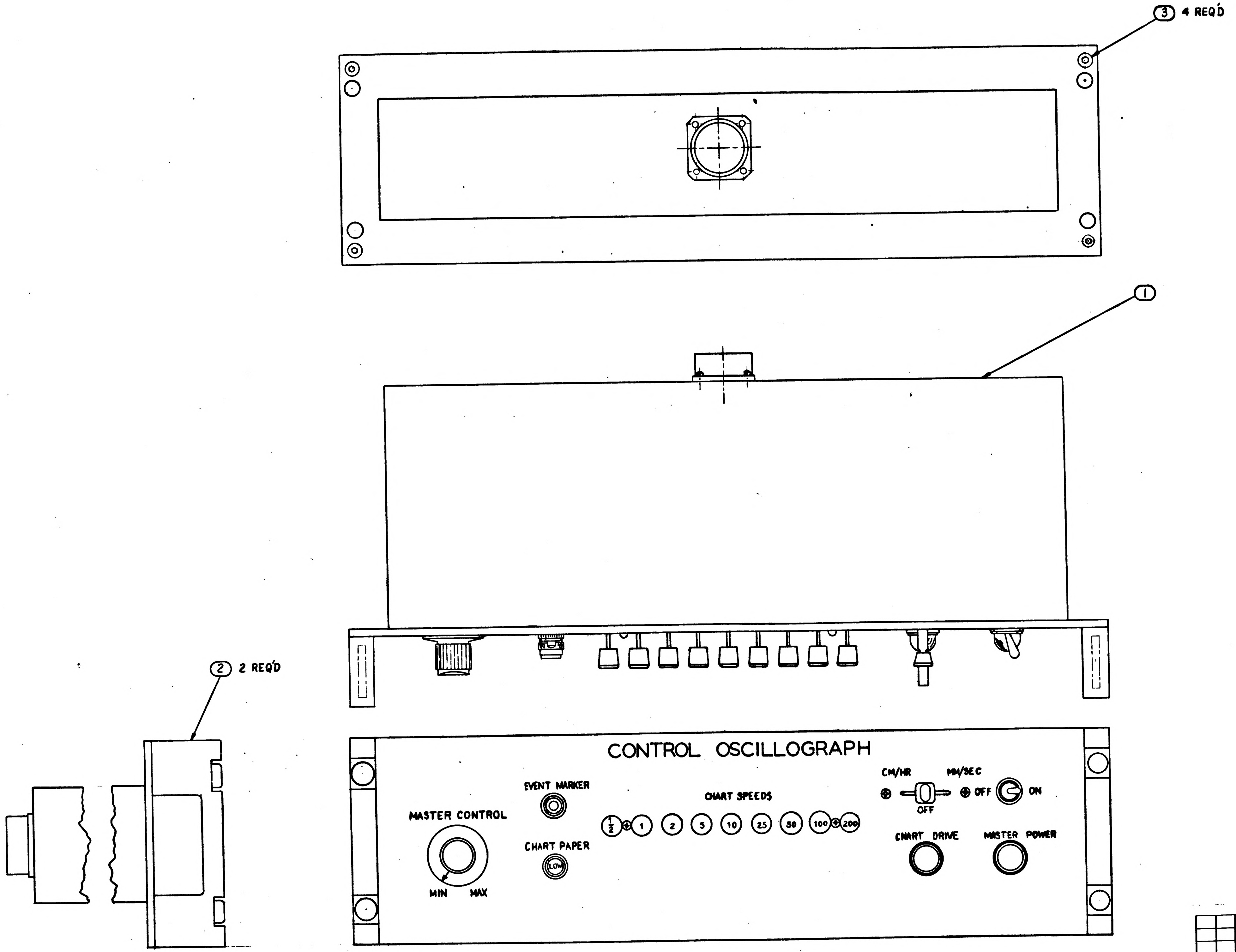
MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		① REPLACES REV "A" WITH CHG. PER MXC 186822		3 AUG 63	DNP
		TDRR 0279			

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



③ 4 REQ'D
①
② 2 REQ'D
CONTROL OSCILLOGRAPH
MASTER CONTROL
MIN
MAX
EVENT MARKER
CHART PAPER
LOW
CHART SPEEDS
½
1
2
5
10
25
50
100
200
CM/HR
MM/SEC
OFF
OFF
ON
CHART DRIVE
MASTER POWER

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 51209 DATE 8 May 63

① REPLACES REV (A) WITH CHANGE

			4		3	1015831 - 257	SCREW, F H, HEX SOC
			2		2	1900015 - 031	HANDLE ASSEMBLY
			1		1	1900072 - 011	CONTROL, OSCILLOGRAPH
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

APPLICATION		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
1902004	1900004	-011

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NASA 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44451
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 25 APR 63
APPROVAL R. RAHN 25 APR 63
APPROVAL L. Jedman 8/27/63
NASA APPROVAL 11/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900046
SCALE —
SHEET OF

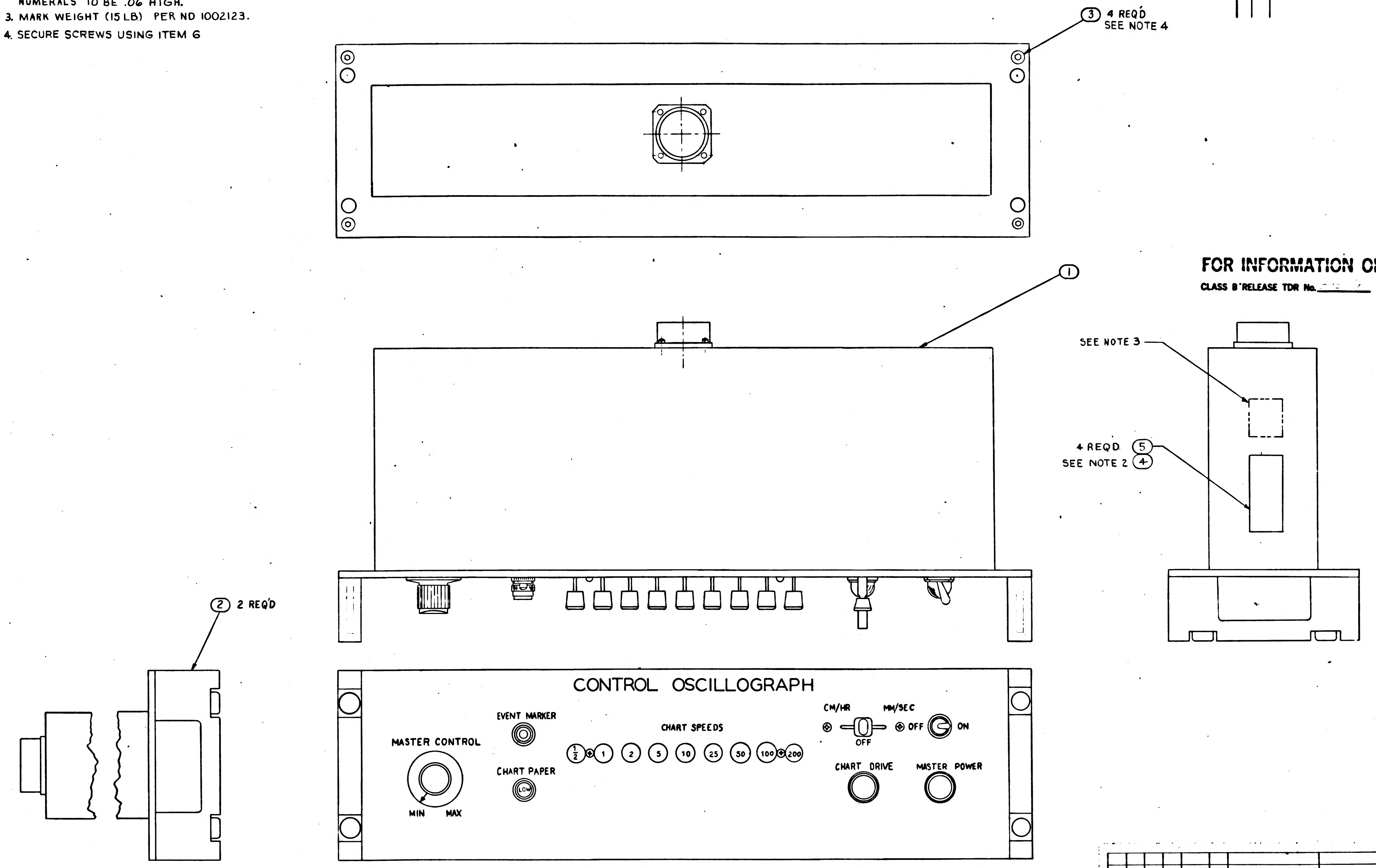
1900046 B

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. ON ITEM ④ IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
3. MARK WEIGHT (15 LB) PER ND 1002123.
4. SECURE SCREWS USING ITEM 6

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		① REPLACES REV A WITH CHG. PER MXC 186822		6 AUG 63	
C		CHANGE IN ACCORDANCE WITH MXC 31407		29 OCT 63	
D		CHANGE IN ACCORDANCE WITH CM 193090		26 DEC 63	
E		CHANGE IN ACCORDANCE WITH CM 194142		16 JAN 64	



③ 4 REQ'D
SEE NOTE 4
①
SEE NOTE 3
4 REQD ⑤
SEE NOTE 2 ④
② 2 REQ'D
CONTROL OSCILLOGRAPH
MASTER CONTROL
MIN
MAX
EVENT MARKER
CHART PAPER
LOW
CHART SPEEDS
½
1
2
5
10
25
50
100
200
CM/HR
MM/SEC
OFF
OFF
ON
CHART DRIVE
MASTER POWER

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ______ DATE 8 May 63

① REPLACES REV (A) WITH CHANGE

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			AR		6	MIL-S-40083-C130	(ES-2544-5) SERVING COMPOUND
			4		5	AN535-00-4	(1897109-004) SCREW, DRIVE
			1		4	1901304-129	NAMEPLATE
			4		3	1015831-253	SCREW, F H, HEX SOC
			2		2	1900015-031	HANDLE ASSEMBLY
			1		1	1900072-011	CONTROL, OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO
1900000	1900000	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NASA 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN SK 44451
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 25 APR 63
APPROVAL R. RAHN 25 APR 63
APPROVAL 8/27/63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO
SIZE E
1900046
SCALE —
SHEET 1 OF 1

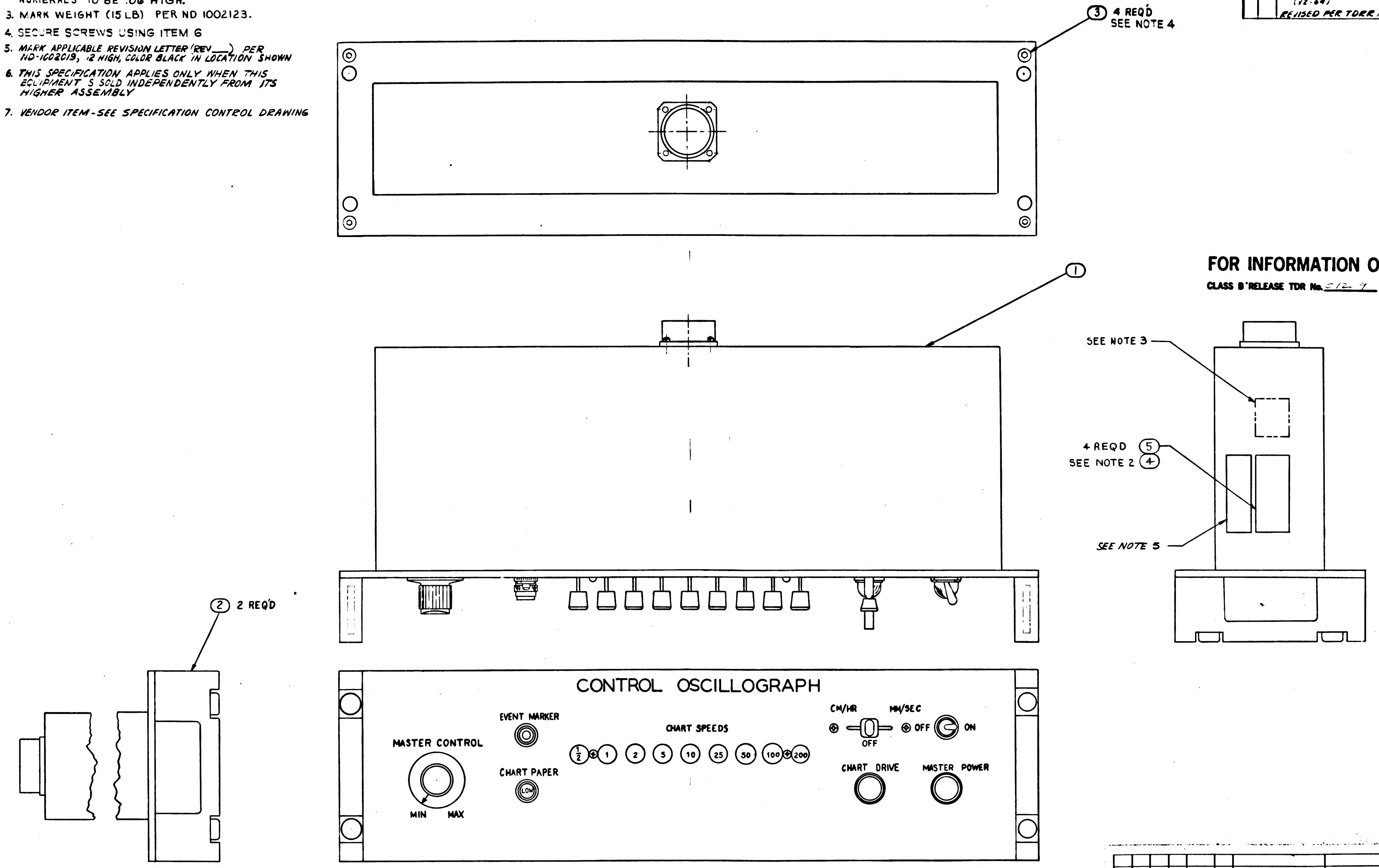
1900046 E

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. ON ITEM ④ IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
3. MARK WEIGHT (15 LB) PER ND 1002123.
4. SECURE SCREWS USING ITEM 6
5. *MARK APPLICABLE REVISION LETTER (REV___) PER ND-1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN*
6. *THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY*
7. *VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING*

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		① REPLACES REV A WITH CHG. PER MXC 186822 TDRR 02791		5 AUG 63	
C		CHANGE IN ACCORDANCE WITH MXC 2,407 [illegible] TDRR 01830		29 OCT 63	
D		CHANGE IN ACCORDANCE WITH CM 93090 [illegible] PER TDRR 01345		26 DEC 63	
E		CHANGE IN ACCORDANCE WITH CM 194142 PER TDRR 0130[illegible]		16 JAN 64	
F		CHANGE IN ACCORDANCE WITH CA 37747 ADDED CUSTOMER DATA (V2-64) REVISED PER TDRR 10223		5 MAY 64	NK GG



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 5129 DATE 8 May 63

SEE NOTE 6

SEE NOTE 7

① **REPLACES REV (A) WITH CHANGE**

					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		7	PS 1900046	PROCUREMENT SPECIFICATION
			AR		6	MIL-S-40083-0130	(ES-2544-5) SERVING COMPOUND
			4		5	AN535-00-4	(1897109-004) SCREW, DRIVE
			1		4	1900304-129	NAMEPLATE
			4		3	1015831-253	SCREW, F H, HEX SOC
			2		2	1900015-031	HANDLE ASSEMBLY
			1		1	1900072-011	CONTROL, OSCILLOGRAPH
			011	EFFECTIVITY			
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NASA 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK 44451

DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALIKOWSKI 25 APR 63
APPROVAL R. RAHN 25 APR 63
APPROVAL L. Jedman 8/27/63
NASA APPROVAL 1/6/64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900046
SCALE —
SHEET 1 OF 1

1900046

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01209 DATE 8 May 63

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4			1015831-257	SCREW, F H, HEX SOC
2			1900015-021	HANDLE ASSY
1			1900072-011	CONTROL, OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN SK 44451

DRAWN E. LITZOW DATE 4-4-63
CHECKED 25 APR 63
APPROVAL R. Rahn Apr 25, 1963
APPROVAL A. P. Kodel 25 APR 63
NASA APPROVAL 5/8/63
L Gedeman 5/8/63
MIT APPROVAL 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL, OSCILLOGRAPH ASSEMBLY

CODE IDENT NO.
SIZE C
1900046
SCALE
SHEET

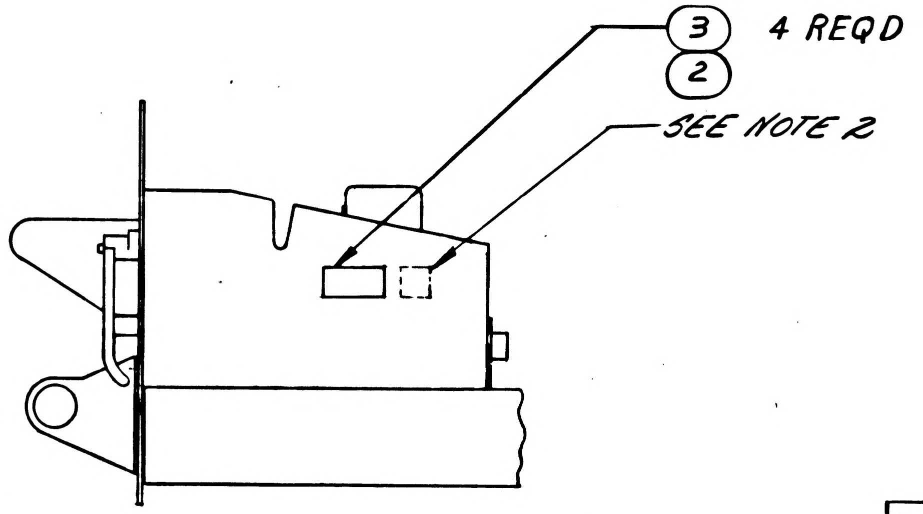
MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900047

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	—	CHANGED IN ACCORDANCE WITH MXC 189958	—	26 SEP 63	ALK
B		CHANGE IN ACCORDANCE WITH MXC 191407		29 OCT 63	J.J.J. PJ
C		CHANGE IN ACCORDANCE WITH CM 193211		6 JAN 64	LA JHS
D	—	CHANGE IN ACCORDANCE WITH CM 193751 PER TDRR 08203	—	20 JAN 64	HC W.D.

PICTURE INCOMPLETE



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01209 DATE 8 May 63

SEE NOTE 4

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2		6	1015795	BRACKET ANGLE
4		5	1015790-001	NUT, BAR
4		4	1015796-001	SPACER, BAR
4		3	AN535-00-4	(1897109-004) SCREW, DRIVE
1		2	1901304-130	NAMEPLATE
1		1	1900073-011	OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK WEIGHT (70 lb) PER ND 1002123.
3. MARK APPLICABLE CONTRACT NO. AND SERIAL NO TO ITEM 2 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
4. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900000	1900000	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS $\pm\frac{1}{16}$ DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44452
DRAWN E. LITZOW DATE 4-4-63
CHECKED 25 APR 63
APPROVAL R. Rahn Apr 25, 1963
APPROVAL 25 APR 63
NASA APPROVAL 5/8/63
L. Gedimay 5/8/63
MIT APPROVAL 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE C
1900047
SCALE —
SHEET

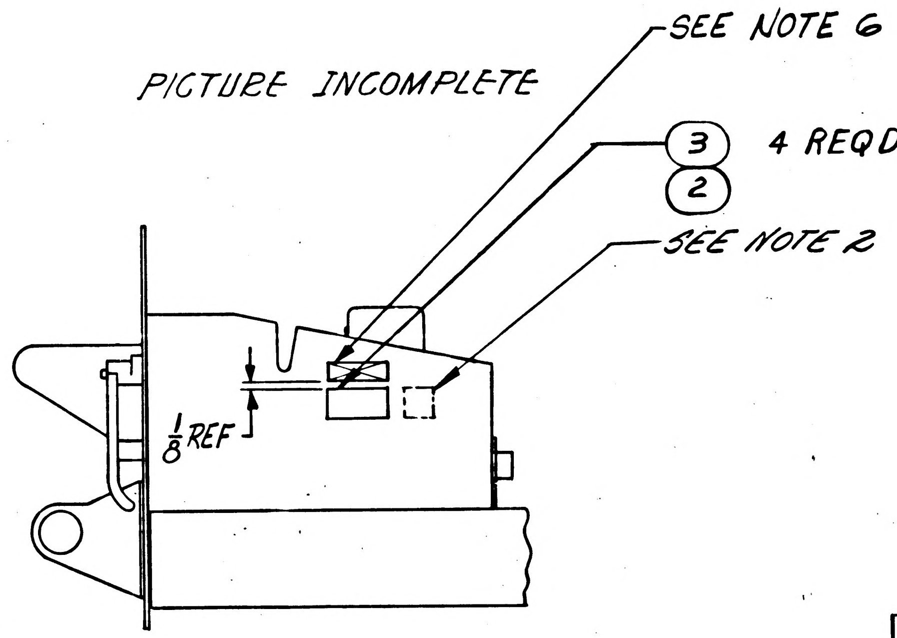
MIL 1078C—P

1900047

5. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM FROM ITS HIGHER ASSEMBLY.

6. MARK APPLICABLE REVISION LETTER (REV —) PER ND 1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A	—	CHANGED IN ACCORDANCE WITH MXC 189958	—	26 SEP 63	ALK
B		CHANGE IN ACCORDANCE WITH MXC 191407		29 OCT 63	J.J.J.
C		CHANGE IN ACCORDANCE WITH CM 193211		6 JAN 64	
D	—	CHANGE IN ACCORDANCE WITH CM 193751 PER TDRR 08203	—	20 JAN 64	HC W.D.
E		REVISED PER TDRR 10196		30 JUN 64	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01209 DATE 8 May 63

SEE NOTE 5

SEE NOTE 4

				X		7	PS 1900047	PROCUREMENT SPECIFICATION
				2		6	1015795	BRACKET ANGLE
				4		5	1015790-001	NUT, BAR
				4		4	1015796-001	SPACER, BAR
				4		3	AN535-00-4	(1897109-004) SCREW, DRIVE
				1		2	1901304-130	NAMEPLATE
				1		1	1900073-011	OSCILLOGRAPH
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS		

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK WEIGHT (70 lb) PER ND 1002123.
3. MARK APPLICABLE CONTRACT NO. AND SERIAL NO TO ITEM 2 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
4. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.

1900000	1900000	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/16 DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44452
DRAWN E. LITZOW DATE 4-4-63
CHECKED 25 APR 63
APPROVAL R. Rahn Apr 25, 1963
APPROVAL 25 APR 63
NASA APPROVAL 5/8/63
L. Gedman 5/8/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO. SIZE C 1900047
SCALE — SHEET

1900047 E

MIL 1078C-P

1900047

PICTURE INCOMPLETE

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01209 DATE 8 May 63

			1			1900073-011	OSCILLOGRAPH
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004	-011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44452
DRAWN E. LITZOW DATE 4-4-63
CHECKED 25 APR 63
APPROVAL R. Rahn Apr 25, 1963
APPROVAL 25 APR 63
NASA APPROVAL 5/8/63
L. Gedeman 5/8/63
MIT APPROVAL 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE C
1900047
SCALE
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900048

Ⓜ

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION "B" PER MXC187698		5 JUL 63	JLC
A		TDRR 02374		7/31/63	WK

PICTURE INCOMPLETE

Ⓐ

REPLACED WITH CHANGE BY REVISION "B" PER MXC 187698

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01255 **DATE** 15 MAY 63

			6			1015826-296	SCREW, FLAT HD, HEX SOCKET
			2			1015790-001	SPACER BAR
			6			1015796-001	NUT BAR
			2			1015795-001	BRACKET
			1			1015793-002	STATIONARY MEMBER (L.H.)
			1			1015793-001	STATIONARY MEMBER (R.H.)
			1			1015794-014	INTERMEDIATE MEMBER (L.H.)
			1			1015794-013	INTERMEDIATE MEMBER (R.H.)
			2			1015792-010	FRONT MEMBER
			1				NAME PLATE
			1			1900061-011	SWITCH BOX
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − —
DECIMALS + — − —
ANGLES + — − —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4-4-63
CHECKED W Diell 2 MAY 63
APPROVAL Ken Jurass
APPROVAL 2 MAY 63
NASA APPROVAL 5/15/63
MIT APPROVAL 5-15-63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH BOX ASSEMBLY

CODE IDENT NO.
SIZE C
1900048
SCALE —
SHEET

MIL 1078C—P

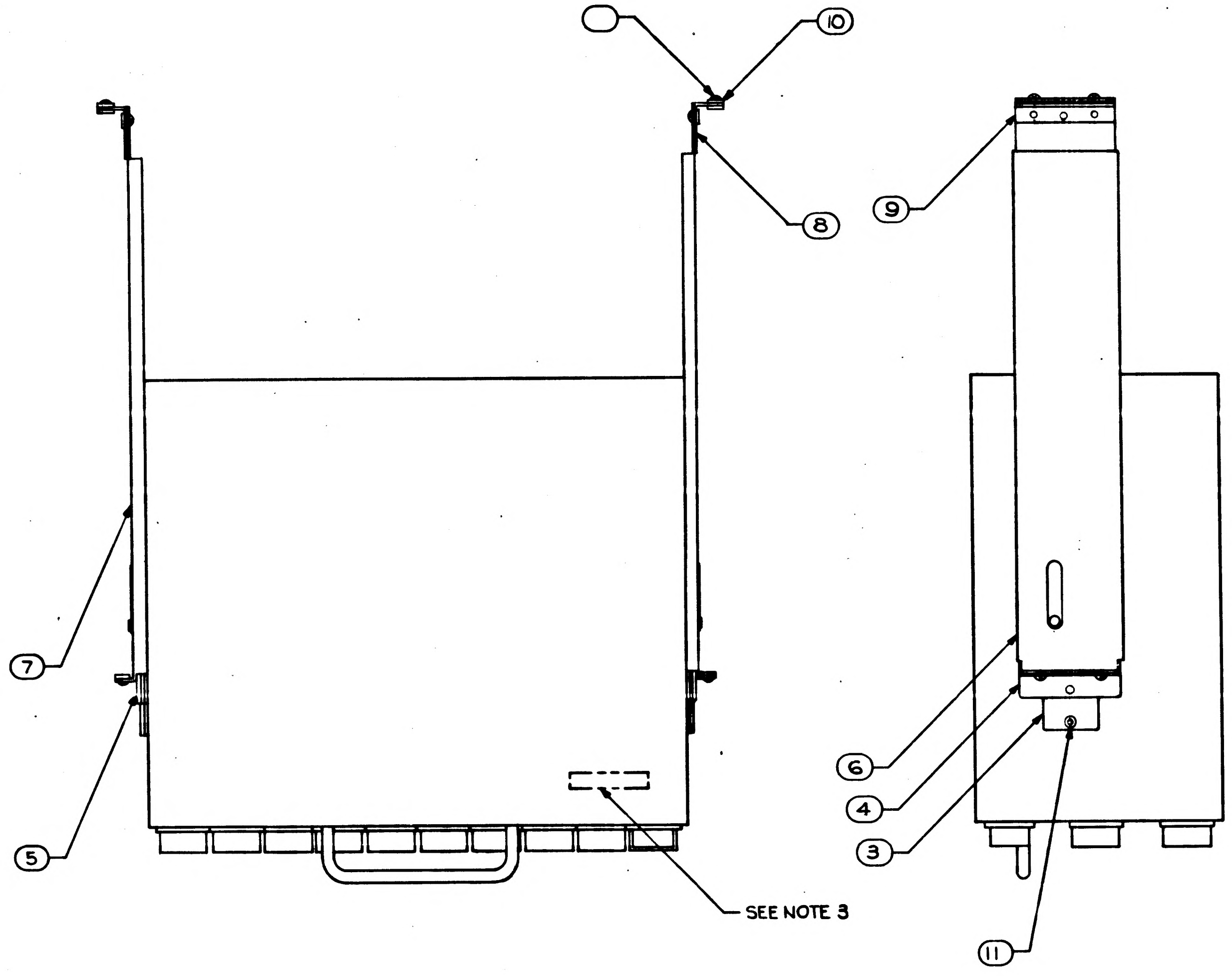
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. MUST BE FREE FROM BURRS AND SHARP EDGES.

3. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.

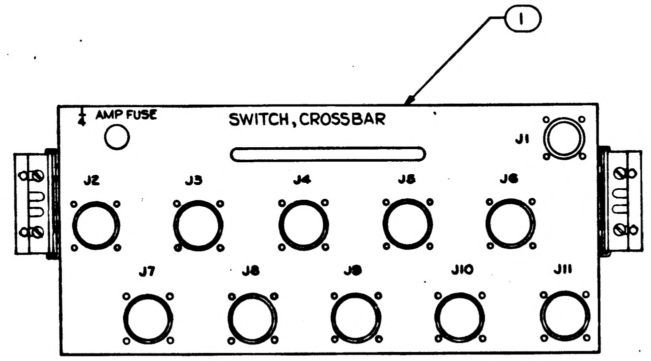
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
B		REPLACES REVISION A WITH CHANGE PER MXC 187698		3 JUL 63	4 JLC
B		TDRR 02374		23	W.C



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01255 DATE 15 May 63

Ⓑ
REPLACES REVISION "A" WITH CHANGE PER MXC187698



1900048 B

			6		11	1015826-296	SCREW, FLAT HD, HEX SOCKET
			2		10	1015790-001	SPACER BAR
			6		9	1015796-001	NUT BAR
			2		8	1015795-001	BRACKET
			1		7	1015793-002	STATIONARY MEMBER (L.H.)
			1		6	1015793-001	STATIONARY MEMBER (R.H.)
			1		5	1900315	INTERMEDIATE MEMBER (L.H.) SPL
			1		4	900223	INTERMEDIATE MEMBER (R.H.) SPL
			2		3	1015792-010	FRONT MEMBER
			1		2		NAMEPLATE
			1		1	1900061-011	SWITCH CROSSBAR
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4APR63
CHECKED W. DIEHL 2MAY 63
APPROVAL KEN JURSS
APPROVAL 7/28/63
NASA APPROVAL
MIT APPROVAL 31 Jul 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

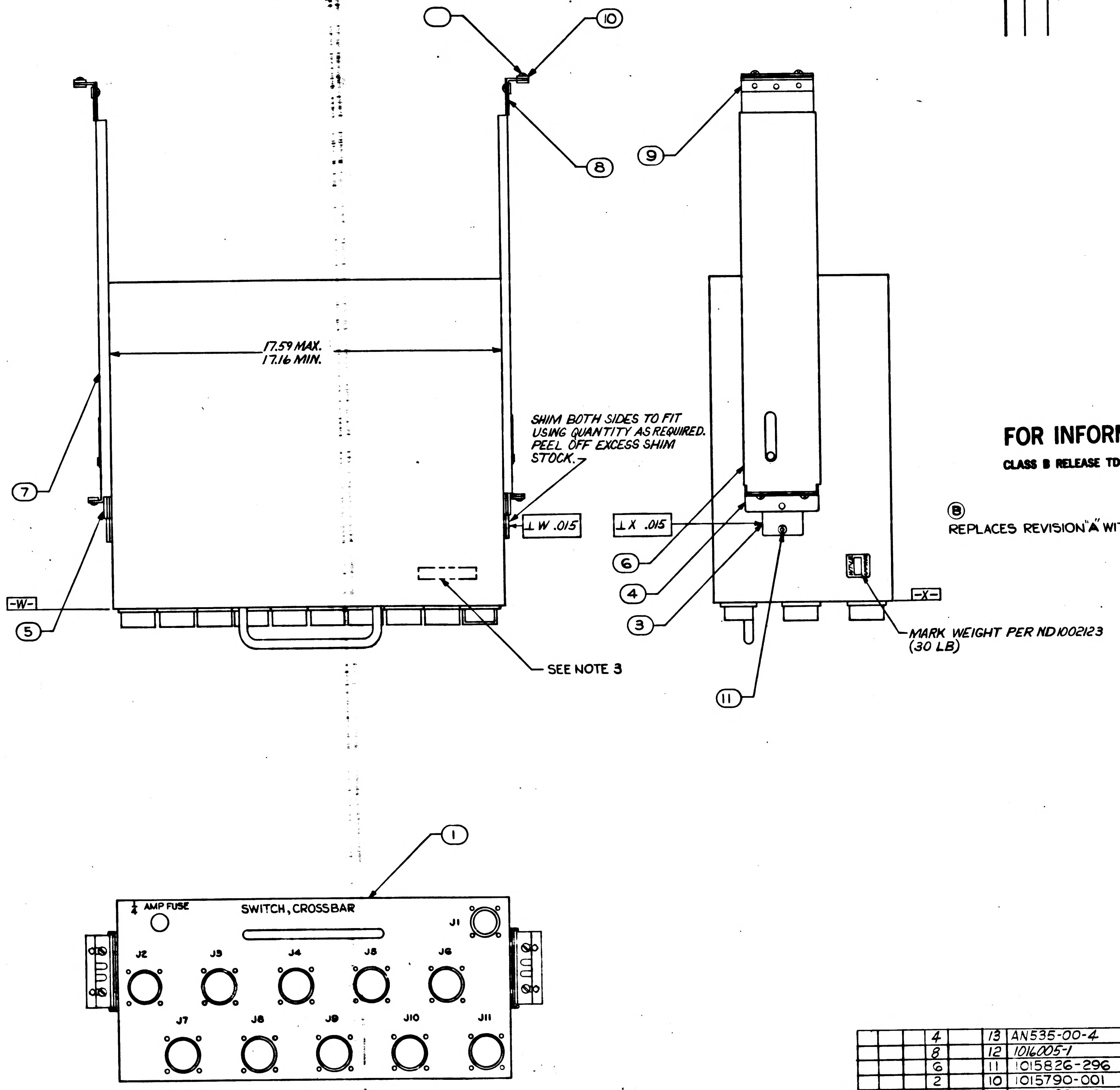
SWITCH CROSSBAR ASSEMBLY

CODE IDENT NO.
SIZE E
1900048
SCALE 1:2
SHEET 1 OF 1

INCHES
PHOTOGRAPHIC SCALE ONLY

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MUST BE FREE FROM BURRS AND SHARP EDGES.
3. IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130.
4. SERIALIZE PER ND 1002023

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		REPLACES REVISION "A" WITH CHANGE PER MXC 187698		5 JUL 63	
Ⓐ B		TDRR 0234		23	
C		REVISED TO AGREE WITH MXC 188563		22 AUG 63	
D		CHANGE IN ACCORDANCE WITH MXC 19140 PER TDRR 05210		29 OCT 63	



10
8
9
7
5
17.59 MAX.
17.16 MIN.
SHIM BOTH SIDES TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
⊥W .015
⊥X .015
-W-
-X-
SEE NOTE 3
6
4
3
11
MARK WEIGHT PER ND1002123 (30 LB)
1
¼ AMP FUSE
SWITCH, CROSSBAR
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
J11

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01255 **DATE** 15 May 63

Ⓑ
REPLACES REVISION "A" WITH CHANGE PER MXC187698

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			4		13	AN535-00-4	(897 09-004) SCREW, DRIVE
			8		12	1016005-1	SHIM, LAMINATED
			6		11	1015826-296	SCREW, FLAT HD, HEX SOCKET
			2		10	1015790-001	SPACER BAR
			6		9	1015796-001	NUT BAR
			2		8	1015795-001	BRACKET
			1		7	1015793-002	STATIONARY MEMBER (L.H.)
			1		6	1015793-001	STATIONARY MEMBER (R.H.)
			1		5	900315	INTERMEDIATE MEMBER (L.H.) SPL
			1		4	900223	INTERMEDIATE MEMBER (R.H.) SPL
			2		3	1015792-010	FRONT MEMBER
			1		2	900704	NAMEPLATE
			1		1	900061-011	SWITCH CROSSBAR

LIST OF PARTS AND MATERIALS

1900004	1900004	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4 APR 63
CHECKED N. DIEHL 2 MAY 63
APPROVAL KEN JURSS
APPROVAL 7/22/63
NASA APPROVAL
MIT APPROVAL 31 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH CROSSBAR ASSEMBLY

CODE IDENT NO. | SIZE E | 1900048
SCALE 1:2 | SHEET 1 OF 1

1900048 D

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. MUST BE FREE FROM BURRS AND SHARP EDGES.

3. MARK APPLICABLE REVISION LETTER (REV__) PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

4. SERIALIZE PER ND 1002023

5. MARK APPLICABLE CONT. NUMBER AND SERIAL NUMBER ON ITEM 2 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.

6. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.

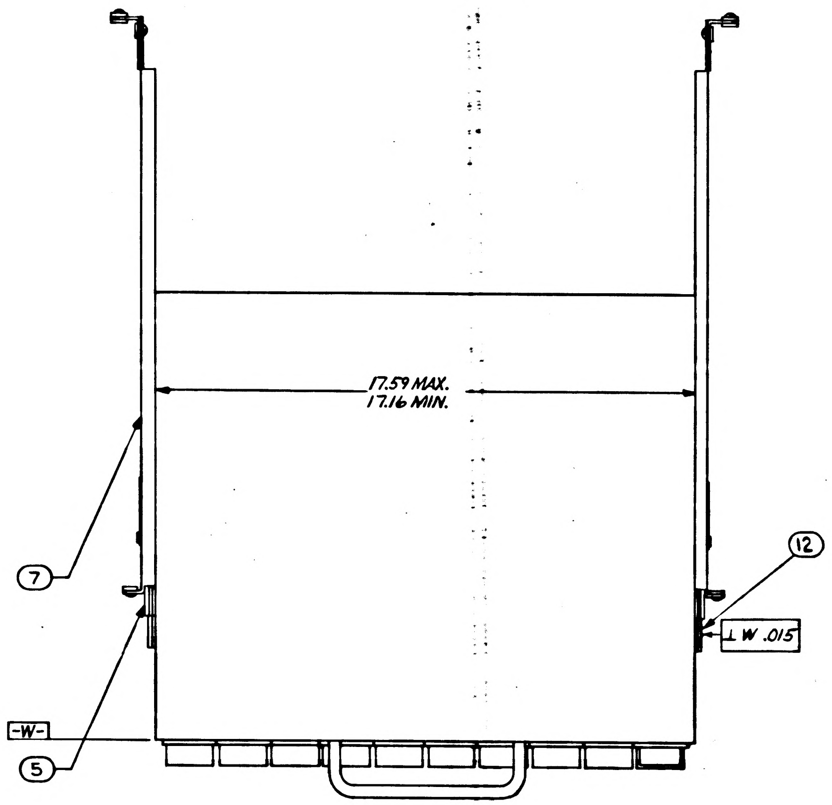
7. MARK SCHEMATIC AND APPLICABLE SCHEMATIC NUMBER 1900078 PER ND1002019, .12 HIGH, COLOR BLACK, TO THE RIGHT OF THE WEIGHT MARKING.

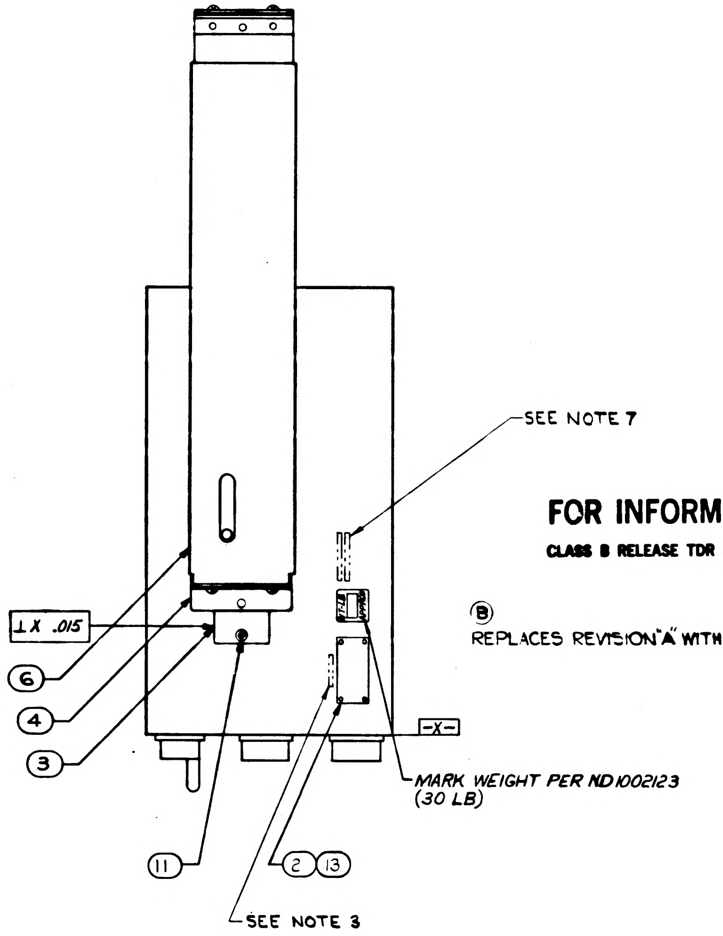
8. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY.

9. SHIM BOTH SIDES TO FIT USING QUANTITY AS REQUIRED OF ITEM ⑫. PEEL OFF EXCESS SHIM STOCK.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		REPLACES REVISION A WITH CHANGE PER MXC 187698		5 JUL 63	JLC
Ⓐ B		TDRR 02374		7/31/63	WR
C		REVISED TO AGREE WITH MXC 188563		22 AUG 63	WOM
D		CHANGE IN ACCORDANCE WITH MXC 19140[illegible] PER TDRR 05210		29 OCT 63 2-7-63	J.J.J. WR
E		CHANGE IN ACCORDANCE WITH CM 92889 PER TDRR 08187		8 JAN 63	PHG
F		CHANGE IN ACCORDANCE WITH CM 196023 PER TDRR 08188		19 MAR 64	RWX

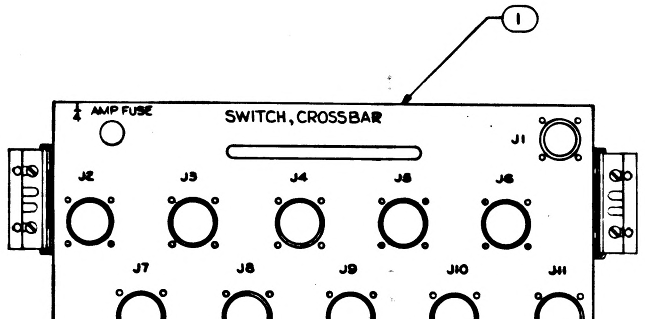




FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1255 DATE 15 May 63

Ⓑ
REPLACES REVISION "A" WITH CHANGE PER MXC187698



				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 8				X		14	PS1900048	PROCUREMENT SPECIFICATION
				4		13	AN535-00-4	(997109-004) SCREW, DRIVE
SEE NOTE 9				8		12	1016005-1	SHIM, LAMINATED
				6		11	1015826-304	SCREW, FLAT HD, HEX SOCKET
SEE NOTE 6				4		10	1015790-001	SPACER BAR
SEE NOTE 6				4		9	1015796-001	NUT BAR
SEE NOTE 6				2		8	1015795-001	BRACKET
				1		7	1015793-002	STATIONARY MEMBER (L.H.)
				1		6	1015793-001	STATIONARY MEMBER (R.H.)
				1		5	900315	INTERMEDIATE MEMBER(L.H.) SPL
				1		4	900223	INTERMEDIATE MEMBER(R.H.)SPL
				2		3	1015792-010	FRONT MEMBER
				1		2	1901304-116	NAMEPLATE
				1		1	900061-011	SWITCH CROSSBAR
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4APR63
CHECKED W. DIEHL 2MAY 63
APPROVAL KEN JURSS
APPROVAL 7/22/63
NASA APPROVAL
MIT APPROVAL 31 July 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH CROSSBAR ASSEMBLY

CODE IDENT NO
SIZE E
1900048
SCALE 1:2
SHEET 1 OF 1

1900048 F

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01255 **DATE** 15 MAY 63

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			6			1015826-296	SCREW, FLAT HD, HEX SOCKET
			2			1015790-001	SPACER BAR
			6			1015796-001	NUT BAR
			2			1015795-001	BRACKET
			1			1015793-002	STATIONARY MEMBER (L.H.)
			1			1015793-001	STATIONARY MEMBER (R.H.)
			1			1015794-014	INTERMEDIATE MEMBER (L.H.)
			1			1015794-013	INTERMEDIATE MEMBER (R.H.)
			2			1015792-010	FRONT MEMBER
			1				NAME PLATE
			1			1900061-011	SWITCH BOX

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4-4-63
CHECKED W. Diell 2 MAY 63
APPROVAL Ken Jurss
APPROVAL A. Riedel 2 MAY 63
NASA APPROVAL 5/15/63
MIT APPROVAL 5-15-63 15 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH BOX ASSEMBLY

CODE IDENT NO.
SIZE C
1900048
SCALE —
SHEET

MIL 1078C—F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900049

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		REPLACED WITH CHANGE BY REVISION B PER MXC 18635	TDRR 01479	13 MAY 63	W.J. / C.G.K. / ARS

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01118 **DATE** 5-1-63

Ⓐ REPLACED WITH CHANGE
REVISION B

							SLIDES
			2			1900015-051	HANDLES
			1			1900023-011	POWER SUPPLY
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4-4-63
CHECKED Mal Kowske 15 APR 63
APPROVAL R. Rahn 4-15-63
APPROVAL A. Födel 15 APR 63
NASA APPROVAL W J Rhine 5-1-63
J P Gilmore 4-30-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
RELAY AND LAMP
ASSEMBLY

CODE IDENT NO.
SIZE C
1900049

SCALE —
SHEET

MIL 1078C—F

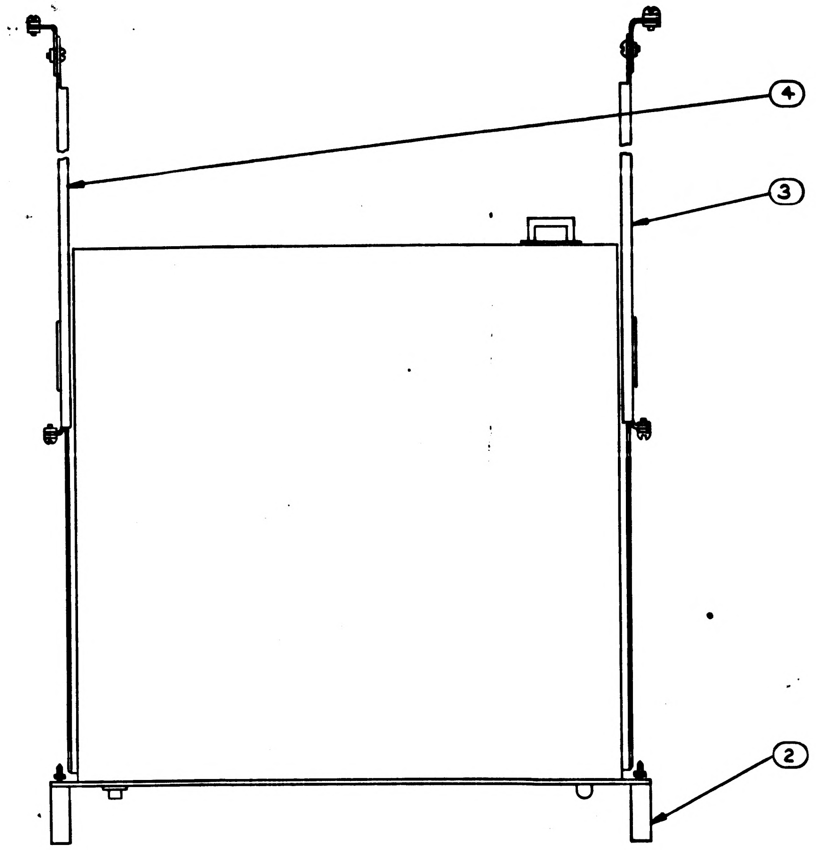
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

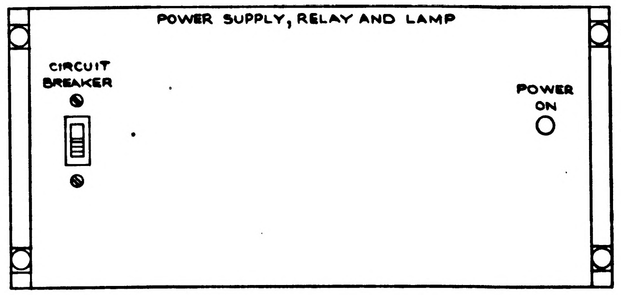
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

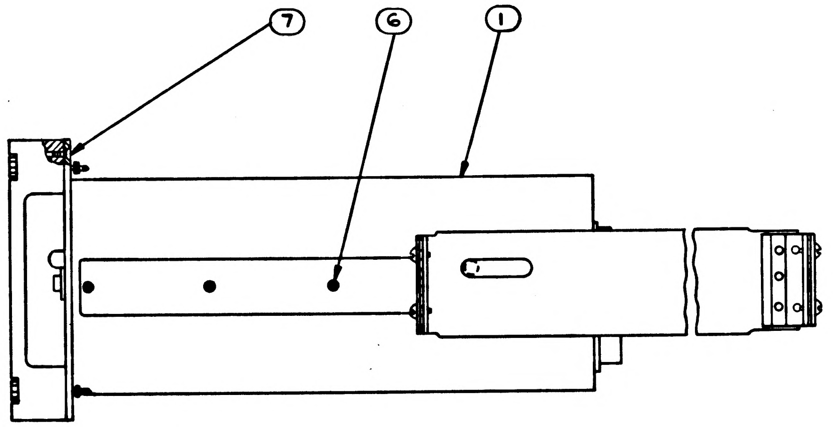
IDENTIFY USING DRAWING No. & REVISION LETTER PER MIL-STD-130. (ES-267)

TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186351	7022	13 MAY 63	WARS
		Replaces Rev A	01479		







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01479 **DATE** 5 Jun 63

Ⓑ REPLACES REVISION A WITH CHANGE B

1900049 B

			8		7	1015831-257	SCREW, FH, 100°, HEX SOCKET
			10		6	1015826-296	SCREW, FH, HEX SOCKET
			1		5		NAMEPLATE
			1		4	1015791-010	SLIDE ASSEMBLY, QUICK RELEASE LH
			1		3	1015791-009	SLIDE ASSEMBLY, QUICK RELEASE RH
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900023-011	POWER SUPPLY, RELAY AND LAMP
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ —— + —— + ——
- —— - —— - ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN E. LITZOW DATE 4 APR 63
CHECKED MALEKOWSKI 15 APR 63
APPROVAL R. RAHN 15 APR 63
APPROVAL A.J. KODEL 15 APR 63
NASA APPROVAL 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY RELAY AND LAMP
ASSEMBLY

CODE IDENT NO.
SIZE E
1900049
SCALE HALF
SHEET

INCHES
0 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

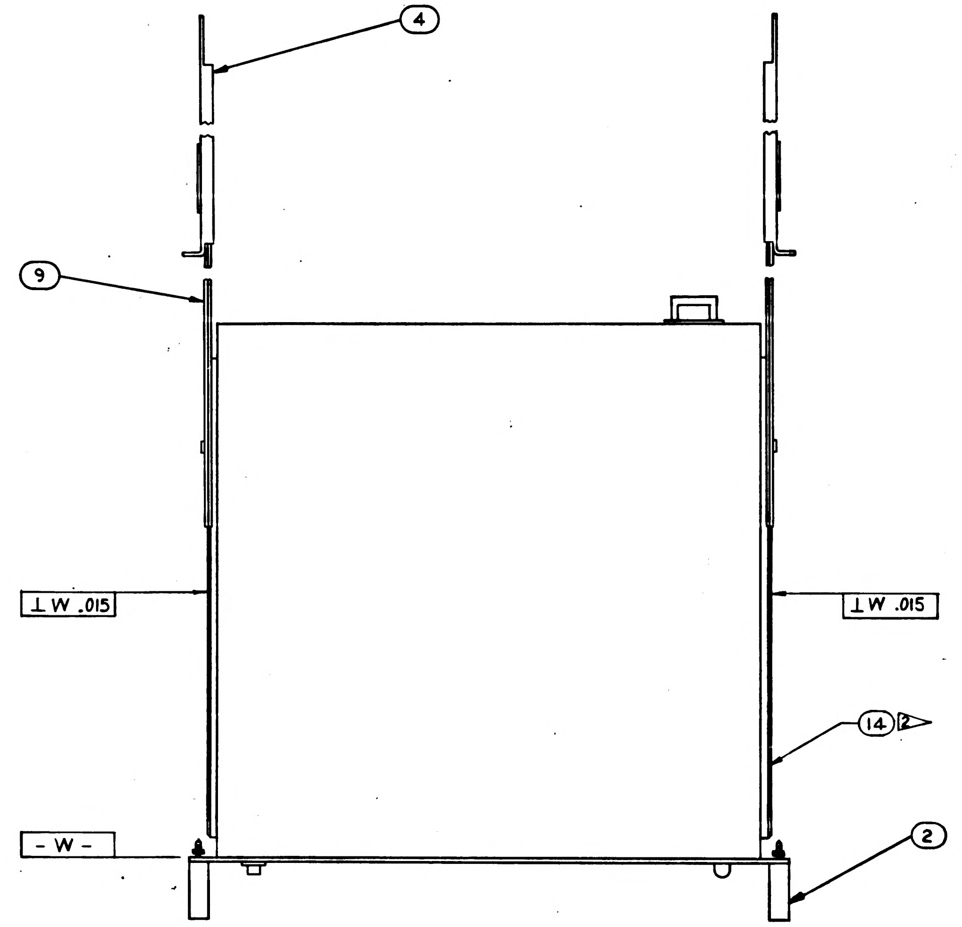
IDENTIFY USING DRAWING No. & REVISION LETTER PER MIL-STD-130. (ES-267)

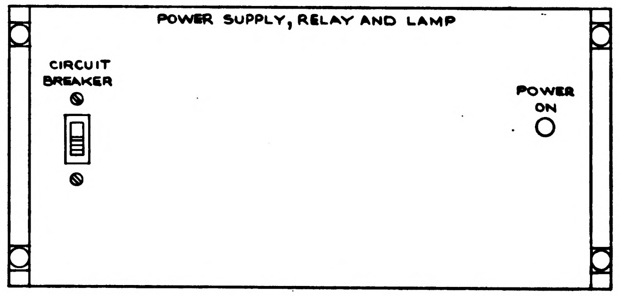
TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.

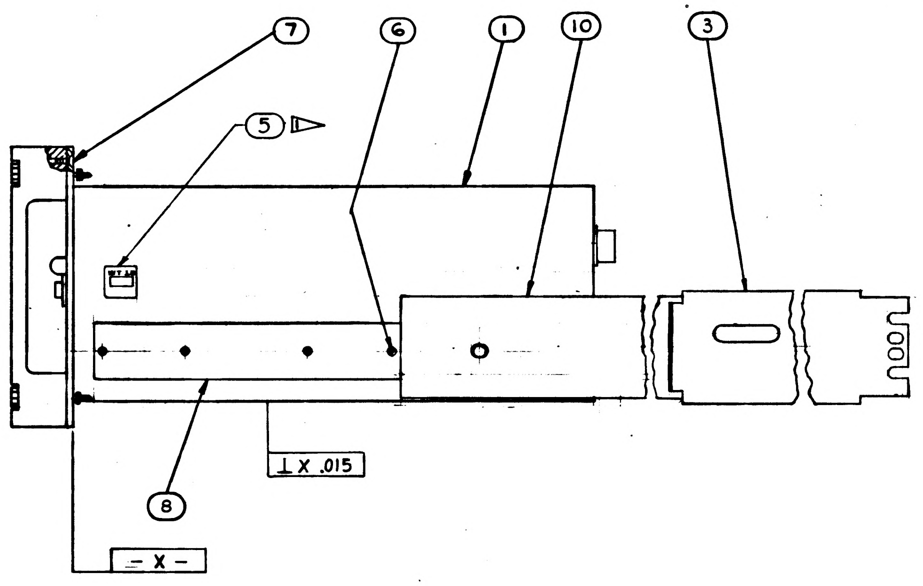
1 MARK WEIGHT OF ASSEMBLY PER ND 100 2123 (115 LB) ADJACENT TO NAMEPLATE LOCATION.

2 SHIM TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		COMPLETELY REVISED AND REDRAWN PER MXC 186351	TDRR	13 MAY 63	
Ⓑ		Replace Rev A	01479	5 Jun 63	
B1		REVISED IN ACCORDANCE WITH MXC-187074	MXC-187074	21 JUN 63	JWH
C		REVISED IN ACCORDANCE WITH MXC 188183		26 JUL 63	CAN
D		CHANGED IN ACCORDANCE WITH MXC 189020		21 AUG 63	DKD
E	-	CHANGED IN ACCORDANCE WITH MXC-189727 PER TDRR 03870	—	[illegible] 63	







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01479 DATE 5 Jun 63

Ⓑ REPLACES REVISION A WITH CHANGE B

QUANTITY REQUIRED				EFFECTIVITY	LIST OF PARTS AND MATERIALS		
			011		ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			8		14	1016005-1	SHIM, LAMINATED
			2		13	1015796-001	BAR, SPACER
			6		12	1015790-001	BAR, NUT
			2		11	1015795-001	BRACKET, REAR SUPPORT
			1		10	1015794-001	SLIDE-INTERMEDIATE SECTION R.H.
			1		9	1015794-002	SLIDE-INTERMEDIATE SECTION L.H.
			2		8	1900250	SLIDE-FRONT SECTION-SPECIAL
			8		7	1015831-257	SCREW, FH, 100°, HEX SOCKET
			6		6	1015826-296	SCREW, FH, HEX SOCKET
			1		5		NAMEPLATE
			1		4	1015793-002	SLIDE-STATIONARY SECTION L.H.
			1		3	1015793-001	SLIDE-STATIONARY SECTION R.H.
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900023-011	POWER SUPPLY, RELAY AND LAMP

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

DRAWN	E. LITZOW	4 APR 63
CHECKED	MALEKOWSKI	15 APR 63
APPROVAL	R. RAHN	15 APR 63
APPROVAL	A.J. KODEL	15 APR 63

NASA APPROVAL
L Gekimaro 6-4-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY RELAY AND LAMP
ASSEMBLY

CODE IDENT NO.
SIZE E
1900049
SCALE HALF
SHEET

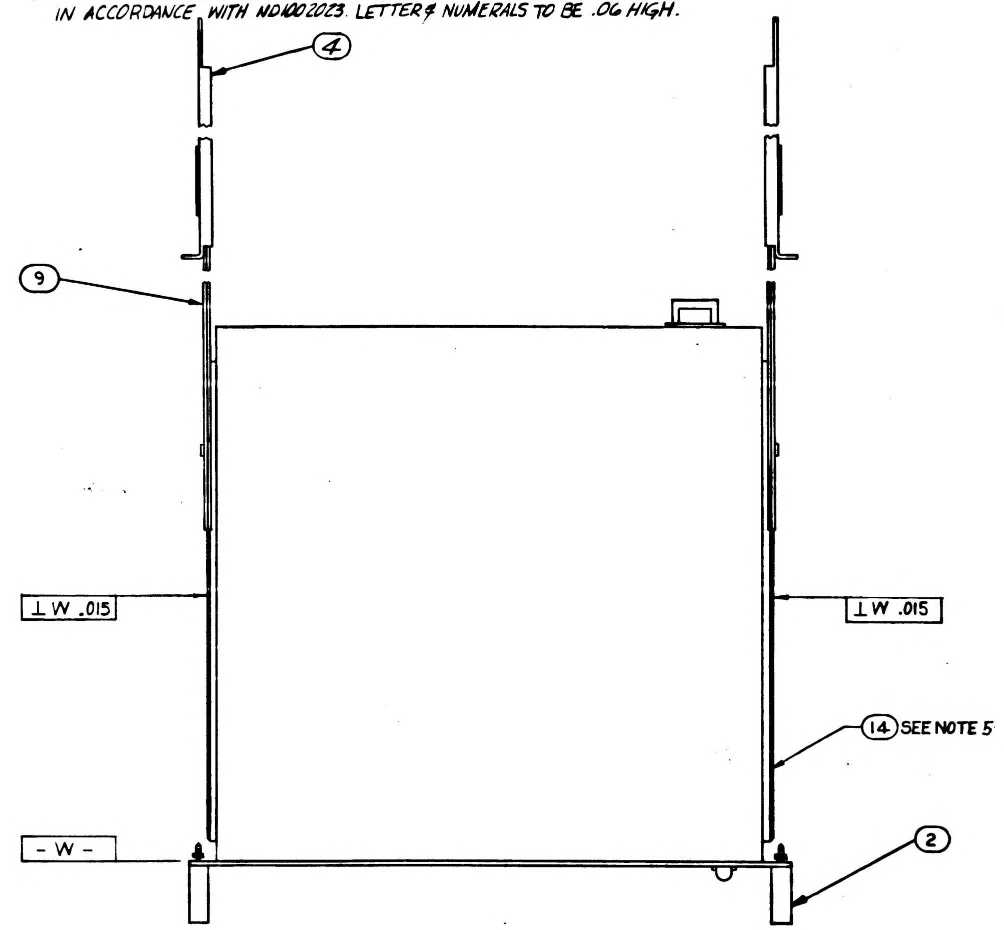
1900049

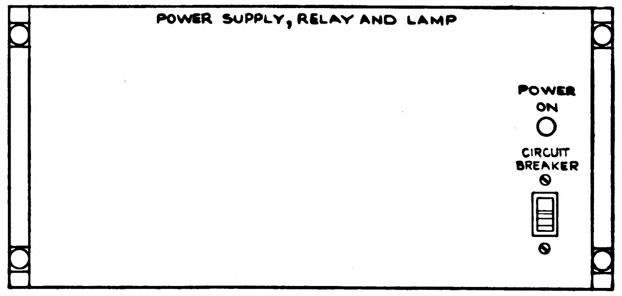
INCHES
PHOTOGRAPHIC SCALE ONLY

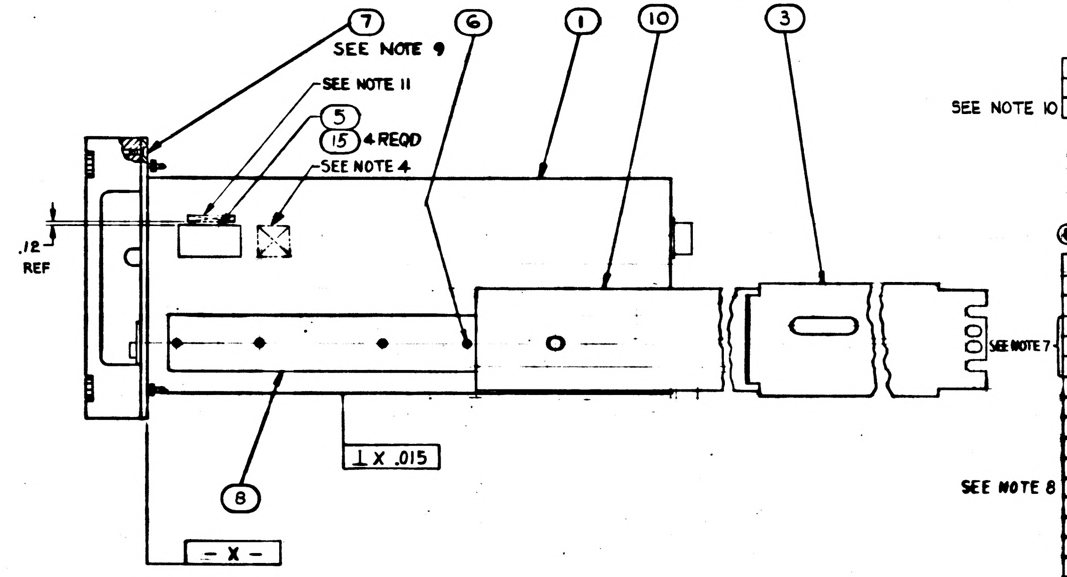
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING No. & REVISION LETTER PER MIL-STD-130. (ES-267)
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT OF ASSEMBLY PER ND 100 2123 (115 LB) ADJACENT TO NAMEPLATE LOCATION.
5. SHIM TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND1002023
7. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.
8. MARK APPLICABLE CONTRACT NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTER & NUMERALS TO BE .06 HIGH.
9. SECURE SCREWS USING ITEM ⑯
10. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY
11. MARK APPLICABLE REVISION LETTER (REV__) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186351	TDRR	13 MAY 63	J.C.G.K. NARS
		Replace Rev A	01479	5 Jun 63	WL
B1		REVISED IN ACCORDANCE WITH MXC-187074	MXC-187074	21 JUN 63	JWH
C		REVISED IN ACCORDANCE WITH MXC 188123		26 JUL 63	C.A.M.
D		CHANGED IN ACCORDANCE WITH MXC 189020		21 AUG 63	DKD
E	-	CHANGED IN ACCORDANCE WITH MXC-189727 PER TDRR 03870	—	17 SEPT 63	WLR
F	-	CHANGE IN ACCORDANCE WITH MXC 191407 TDRR 03879	—	3 OCT 63	WJM
G	-	CHANGE IN ACCORDANCE WITH CM 92659 PER TDRR 08180	—	DEC 63	
H	-	CHANGE IN ACCORDANCE WITH CV 94143 PER TDRR 08180	—	16 JAN 64	RJF
J	—	CHANGE IN ACCORDANCE WITH CM 96024 PER TDRR 08182	—	6 MAR 64	







SEE NOTE 10

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01479 DATE 5 Jun 63

Ⓑ REPLACES REVISION "A" WITH CHANGE "B"

SEE NOTE 7

SEE NOTE 8

			QTY	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		17	PS 1900049	PROCUREMENT SPECIFICATION
			AR		16	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
			4		15	AN535-00-4	SCREW, DRIVE
			8		14	1016005-1	SHIM, LAMINATED
			4		13	1015796-001	BAR, SPACER
			4		12	1015790-001	BAR, NUT
			2		11	1015795-001	BRACKET, REAR SUPPORT
			1		10	1015794-001	SLIDE-INTERMEDIATE SECTION R.H.
			1		9	1015794-002	SLIDE-INTERMEDIATE SECTION L.H.
			2		8	1900250	SLIDE-FRONT SECTION-SPECIAL
			8		7	1015831-253	SCREW, FH, 100°, HEX SOCKET
			6		6	1015826-300	SCREW, FH, HEX SOCKET
			1		5	1901304-122	NAMEPLATE (AS APPLICABLE)
			1		4	1015793-002	SLIDE-STATIONARY SECTION L.H.
			1		3	1015793-001	SLIDE-STATIONARY SECTION R.H.
			2		2	1900015-051	HANDLE ASSEMBLY
			1		1	1900023-011	POWER SUPPLY, RELAY AND LAMP
QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

		DATE
DRAWN	E. LITZOW	4 APR 63
CHECKED	MALEKOWSKI	15 APR 63
APPROVAL	R. RAHN	15 APR 63
APPROVAL	A.J. KODEL	15 APR 63

NASA APPROVAL

MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY RELAY AND LAMP ASSEMBLY

CODE IDENT NO.

SIZE E

1900049

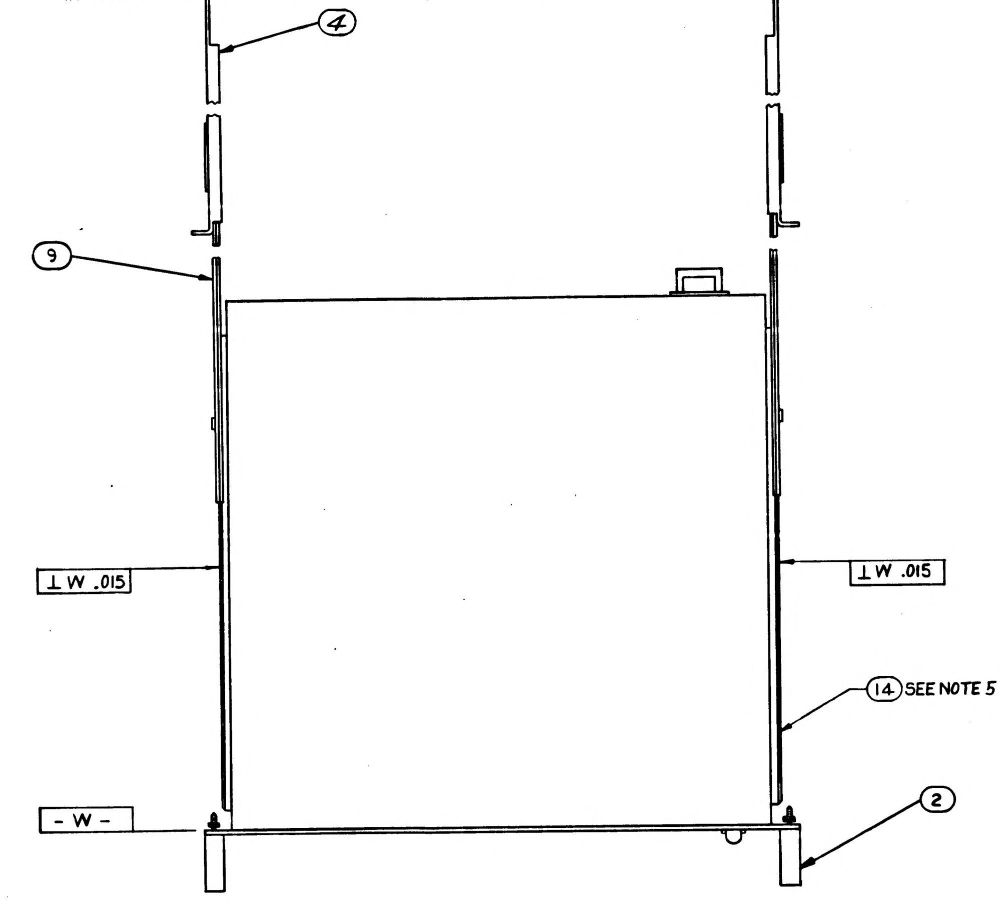
SCALE HALF

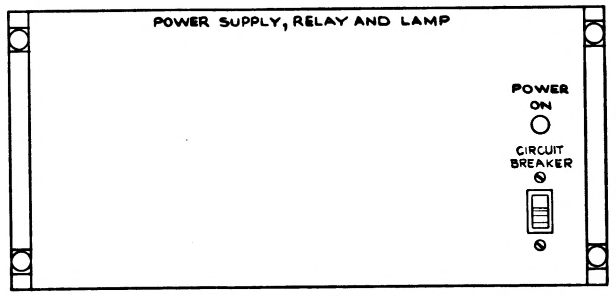
SHEET

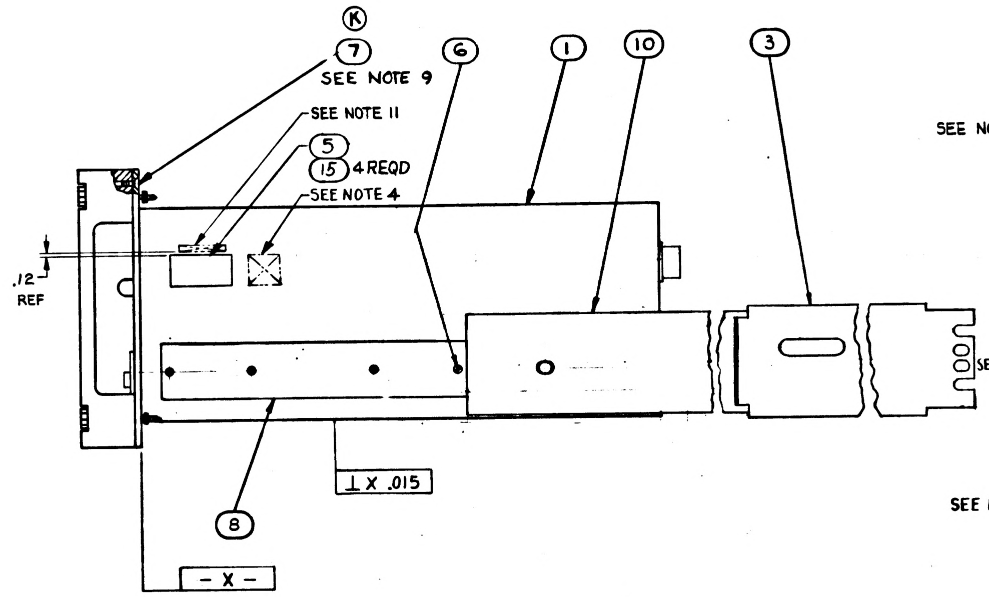
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING No. & REVISION LETTER PER MIL-STD-130. (ES-267)
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT OF ASSEMBLY PER ND 100 2123 (115 LB) ADJACENT TO NAMEPLATE LOCATION.
5. SHIM TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND 1002023
7. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.
8. MARK APPLICABLE CONTRACT NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTER & NUMERALS TO BE .06 HIGH.
9. SECURE SCREWS USING ITEM ⑯
10. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY
11. MARK APPLICABLE REVISION LETTER (REV___) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186351	TDRR	13 MAY 63	WARS
		Replace Rev A	01479	5 Jun 63	
B1		REVISED IN ACCORDANCE WITH MXC-187074	MXC-187074	21 JUN 63	JHH
C		REVISED IN ACCORDANCE WITH MXC 188183		26 JUL 63	C.A.M.
D		CHANGED IN ACCORDANCE WITH MXC 189020		21 AUG 63	DKD
E	-	CHANGED IN ACCORDANCE WITH MXC-189727 PER TDRR 03820	—	17 SEPT 63 1 OCT 63	M.G. WR
F	-	CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 179	—	3 OCT 63	WJM
G	-	CHANGE IN ACCORDANCE WITH CM 92659 PER TDRR 08180	—	DEC 63	
H	-	CHANGE IN ACCORDANCE WITH CM 194143 PER TDRR 08181	—	16 JAN 64	RJF
J	—	CHANGE IN ACCORDANCE WITH CM 196024 PER TDRR 08182	—	6 MAR 64	
K		REVISED PER TDR 0873	—	17 JUL 64	RJF







FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01479 DATE 5 Jun 63

Ⓑ REPLACES REVISION "A" WITH CHANGE "B"

	QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				011				
SEE NOTE 10				X		17	PS 1900049	PROCUREMENT SPECIFICATION
				AR		16	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
				4		15	AN535-00-4	SCREW, DRIVE
				8		14	1016005-1	SHIM, LAMINATED
SEE NOTE 7				4		13	1015796-001	BAR, SPACER
SEE NOTE 7				4		12	1015790-001	BAR, NUT
SEE NOTE 7				2		11	1015795-001	BRACKET, REAR SUPPORT
				1		10	1015794-001	SLIDE-INTERMEDIATE SECTION R.H.
				1		9	1015794-002	SLIDE-INTERMEDIATE SECTION L.H.
				2		8	1900250	SLIDE-FRONT SECTION-SPECIAL
				8		7	AN507C832R12	(1897003-568) SCREW, FLAT HD 100°
				6		6	1015826-300	SCREW, FH, HEX SOCKET
SEE NOTE 8				1		5	1901304-122	NAMEPLATE (AS APPLICABLE)
				1		4	1015793-002	SLIDE-STATIONARY SECTION L.H.
				1		3	1015793-001	SLIDE-STATIONARY SECTION R.H.
				2		2	1900015-051	HANDLE ASSEMBLY
				1		1	1900023-011	POWER SUPPLY, RELAY AND LAMP

LIST OF PARTS AND MATERIALS

K

1900049

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

		DATE
DRAWN	E. LITZOW	4 APR 63
CHECKED	MALE KOWSKI	15 APR 63
APPROVAL	R. RAHN	15 APR 63
APPROVAL	A. J. KODEL	15 APR 63

NASA APPROVAL L Gehmany 6/4/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

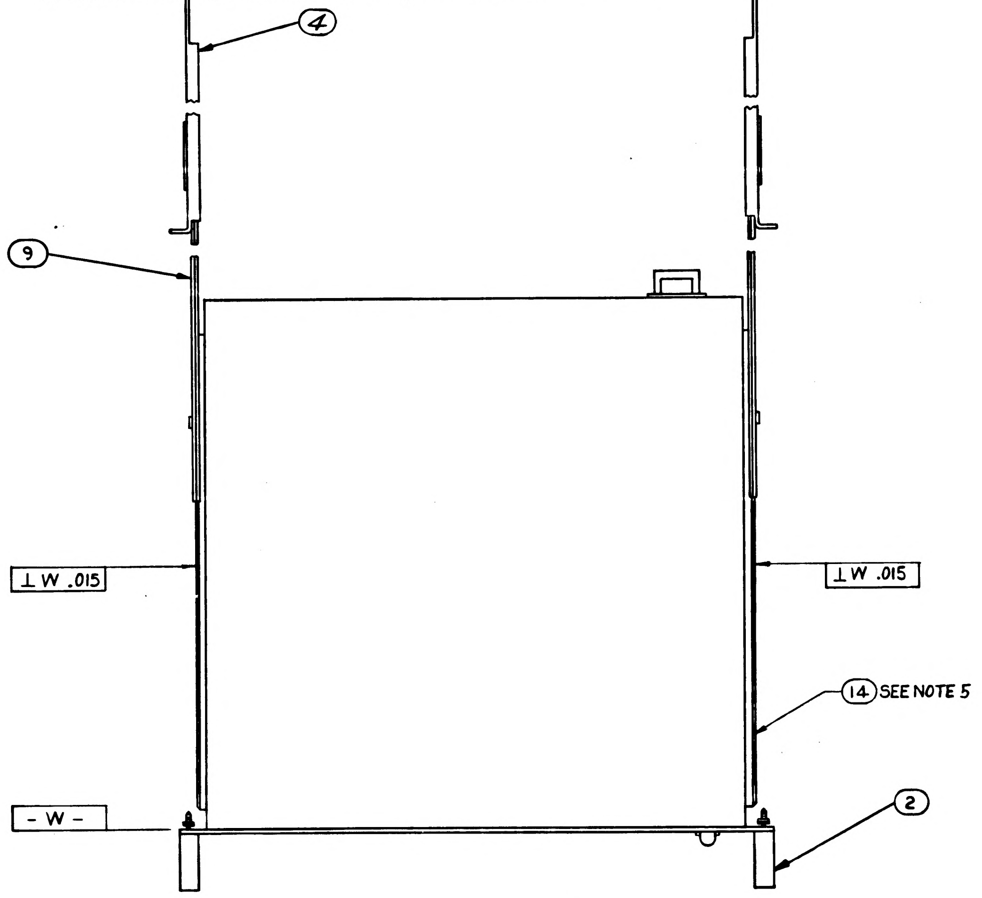
POWER SUPPLY RELAY AND LAMP
ASSEMBLY

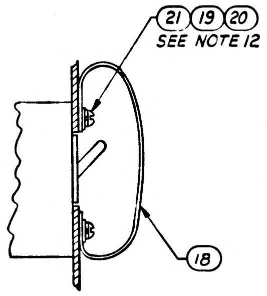
CODE IDENT NO.
SIZE E
1900049
SCALE HALF
SHEET

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. IDENTIFY USING DRAWING No. & REVISION LETTER PER MIL-STD-130. (ES-267)
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION.
4. MARK WEIGHT OF ASSEMBLY PER ND 100 2123 (115 LB) ADJACENT TO NAMEPLATE LOCATION.
5. SHIM TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
6. SERIALIZE PER ND1002023
7. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.
8. MARK APPLICABLE CONTRACT NO. & SERIAL NO. ON ITEM 5 IN ACCORDANCE WITH ND1002023. LETTER & NUMERALS TO BE .06 HIGH.
9. SECURE SCREWS USING ITEM ⑯
10. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY
11. MARK APPLICABLE REVISION LETTER (REV__) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
12. SUBSTITUTE ITEM 21 FOR CIRCUIT BREAKER MOUNTING SCREWS.

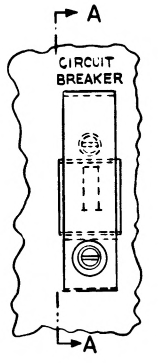
REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186351	TCRR	13 MAY 63	C.G.K. JARS
		Replace Rev A	01479	5 Jun 63	
B1		REVISED IN ACCORDANCE WITH MXC-187074	MXC-187074	21 JUN 63	JHH
C		REVISED IN ACCORDANCE WITH MXC 188183		26 JUL 63	CAM
D		CHANGED IN ACCORDANCE WITH MXC 189020		2 AUG 63	DKD
E	-	CHANGED IN ACCORDANCE WITH MXC-189727 PER TDRR 23822	—	63	WJC
F	-	CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 28179	—	8 OCT 63	WJM
G	-	CHANGE IN ACCORDANCE WITH CM 92659 PER TDRR 28180	—	4 DEC 63	
H	-	CHANGE IN ACCORDANCE WITH CN 94143 PER TDRR 08181	—	16 JAN 64	RJF
J	—	CHANGE IN ACCORDANCE WITH CM 96026 PER TDRR 08182	—	6 MAR 64	
K		REVISED PER TDR 0873	—	17 JUL 64	
L		REVISED PER TDRR 17860	—	30 MAR 65	

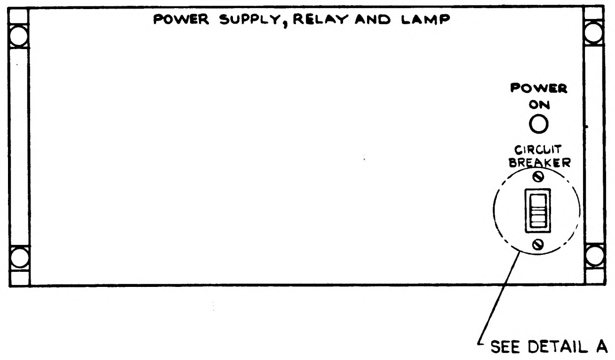


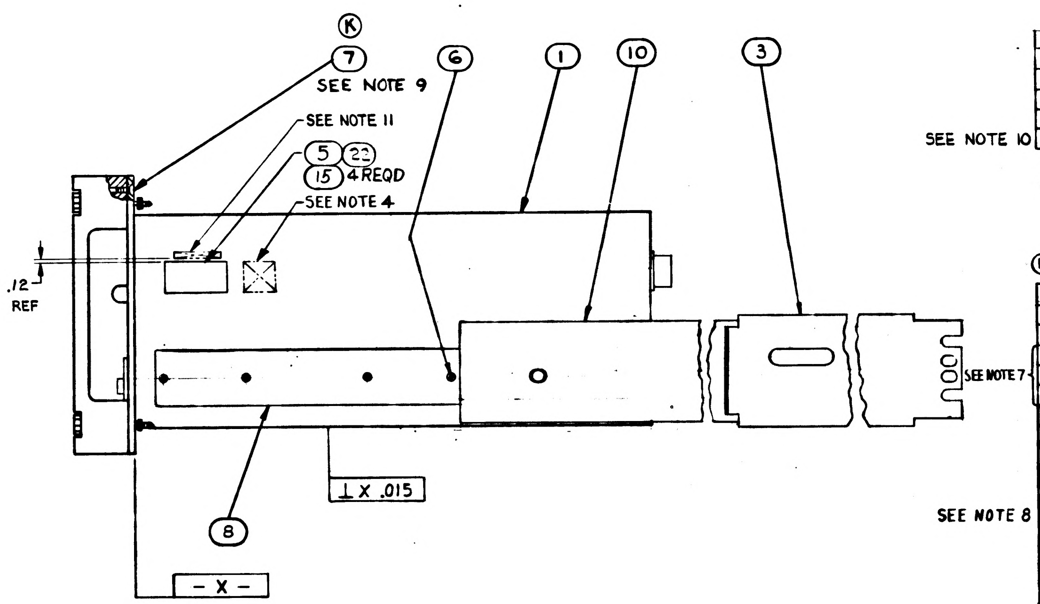


VIEW A-A



DETAIL A
1900049-021





					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
		1			22	1901304-167	NAMEPLATE (AS APPLICABLE)
		2			21	MS 35233-28	SCREW, PAN HD
		2			20	MS 35338-41	WASHER, LOCK
		2			19	AN960-C6L	(1897006-036) WASHER, FLAT
		1			18	1902280	GUARD, CIRCUIT BREAKER
		X	X		17	PS 1900049	PROCUREMENT SPECIFICATION

SEE NOTE 10

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01479 DATE 5 Jun 63

Ⓑ REPLACES REVISION "A" WITH CHANGE "B"

		AR	AR		16	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
		4	4		15	AN535-00-4	SCREW, DRIVE
		8	8		14	1016005-1	SHIM, LAMINATED
		4	4		13	1015796-001	BAR, SPACER
		4	4		12	1015790-001	BAR, NUT
		2	2		11	1015795-001	BRACKET, REAR SUPPORT
		1	1		10	1015794-001	SLIDE-INTERMEDIATE SECTION R.H.
		1	1		9	1015794-002	SLIDE-INTERMEDIATE SECTION L.H.
		2	2		8	1900250	SLIDE-FRONT SECTION-SPECIAL
		8	8		7	AN507C832R12	(1897003-568) SCREW, FLAT HD 100°
		6	6		6	1015826-300	SCREW, FH, HEX SOCKET
		-	1		5	1901304-122	NAMEPLATE (AS APPLICABLE)
		1	1		4	1015793-002	SLIDE-STATIONARY SECTION L.H.
		1	1		3	1015793-001	SLIDE-STATIONARY SECTION R.H.
		2	2		2	1900015-051	HANDLE ASSEMBLY
		1	1		1	1900023-011	POWER SUPPLY, RELAY AND LAMP
		021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

SEE NOTE 7 (items 11–13)

SEE NOTE 8 (item 5)

NEXT ASSY	USED ON
1900004	1900004
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

AC SP PN

DRAWN	E. LITZOW	4 APR 63
CHECKED	MALEKOWSKI	15 APR 63
APPROVAL	R. RAHN	15 APR 63
APPROVAL	A.J. KODEL	15 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

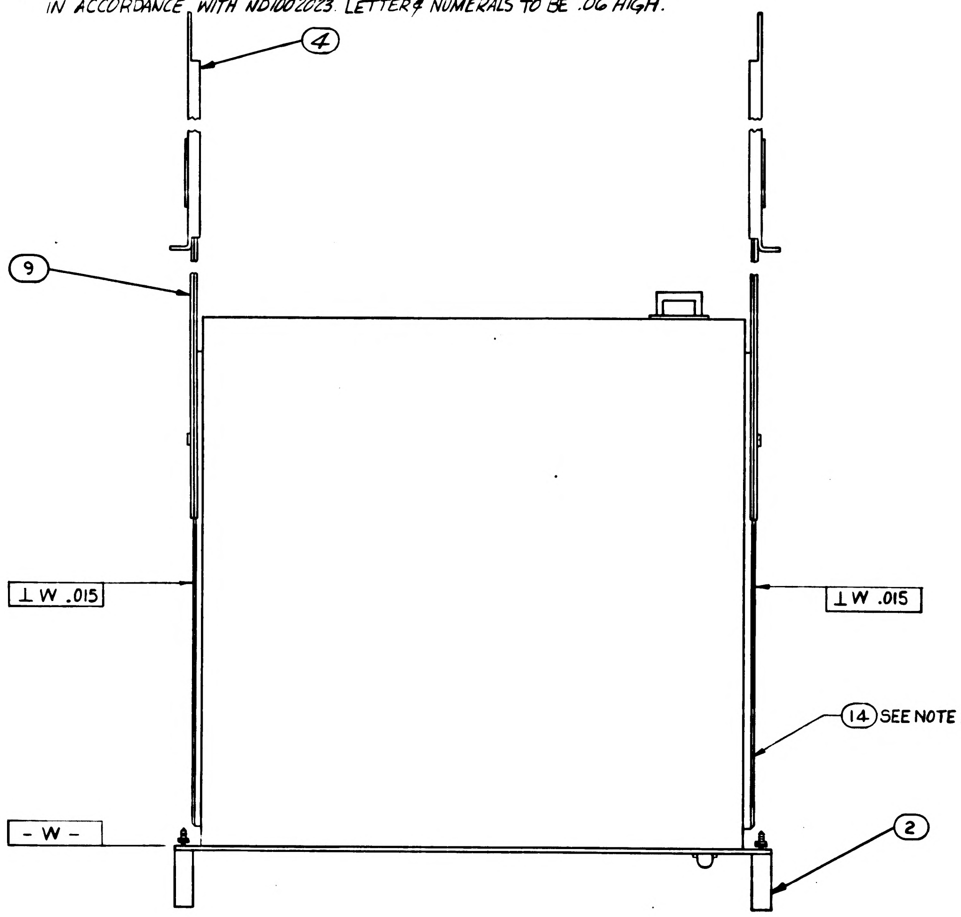
POWER SUPPLY RELAY AND LAMP
ASSEMBLY

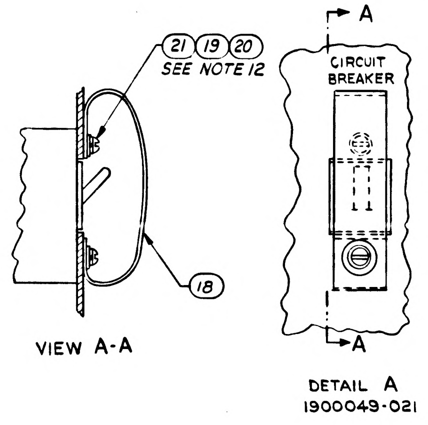
CODE IDENT NO.
SIZE E
1900049
SCALE HALF
SHEET

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. TORQUE ITEM ⑥ TO 33-36 INCH POUNDS AT INSTALLATION OF SLIDES ON 1900049-031 ASSEMBLY
3. TORQUE ITEM ⑥ TO 37-40 INCH POUNDS AT INSTALLATION OF SLIDES ON 1900049-011 & 1900049-021 ASSEMBLY.
4. MARK WEIGHT OF ASSEMBLY PER ND 100 2123 (115 LB) ADJACENT TO NAMEPLATE LOCATION.
5. SHIM TO FIT USING QUANTITY AS REQUIRED. PEEL OFF EXCESS SHIM STOCK.
~~6. SERIALIZE PER ND1002023~~
7. LOOSE MOUNTING HARDWARE REQUIRED FOR INSTALLATION.
8. *MARK APPLICABLE CONTRACT NO. & SERIAL NO. ON ITEM ⑤ IN ACCORDANCE WITH ND1002023. LETTER & NUMERALS TO BE .06 HIGH.*
9. SECURE SCREWS USING ITEM ⑯
10. THIS SPECIFICATION APPLIES ONLY WHEN THIS EQUIPMENT IS SOLD INDEPENDENTLY FROM ITS HIGHER ASSEMBLY
~~11. MARK APPLICABLE REVISION LETTER (REV __) PER ND1002019 .12 HIGH, COLOR BLACK IN LOCATION SHOWN.~~
12. SUBSTITUTE ITEM ㉑ FOR CIRCUIT BREAKER MOUNTING SCREWS.

REVISIONS

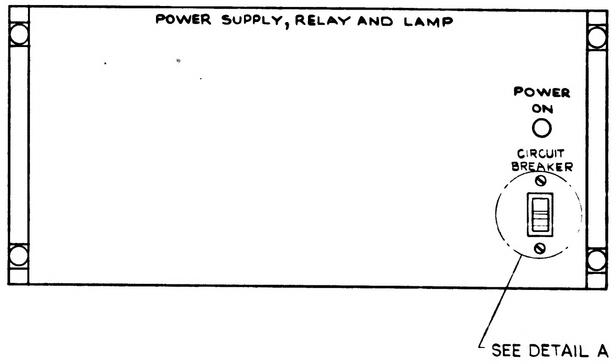
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		COMPLETELY REVISED AND REDRAWN PER MXC 186351	TDRR	13 MAY 63	C.G.K. JARS
		Replace Rev A	61479	[illegible]	
B1		REVISED IN ACCORDANCE WITH MXC-187074	MXC-187074	21 JUN 63	JHH
C		REVISED IN ACCORDANCE WITH MXC 188183		26 JUL 63	CAM
D		CHANGED IN ACCORDANCE WITH MXC 189020		21 AUG 63	DKD
E	-	CHANGED IN ACCORDANCE WITH MXC-189727 PER TDRR 23870	—	[illegible] 63	
F	-	CHANGE IN ACCORDANCE WITH MXC 191407 PER TDRR 28179	—	3 OCT 63	WJM
G	-	CHANGE IN ACCORDANCE WITH CN 92659 PER TDRR 28180	—	DEC 63	
H	-	CHANGE IN ACCORDANCE WITH CN 94143 PER TDRR 08181	—	16 JAN 64	R.F.
J	—	CHANGE IN ACCORDANCE WITH CN 96024 PER TDRR 08182	—	MAR 64	
K		REVISED PER TDR 0873	—	17 JUL 64	R.F.
L		REVISED PER TDRR 17860	—	30 MAR 65	
M	-	REVISED & UPGRADED TO CLASS A PER TDRR 19.24	—	2 MAY 65	AU

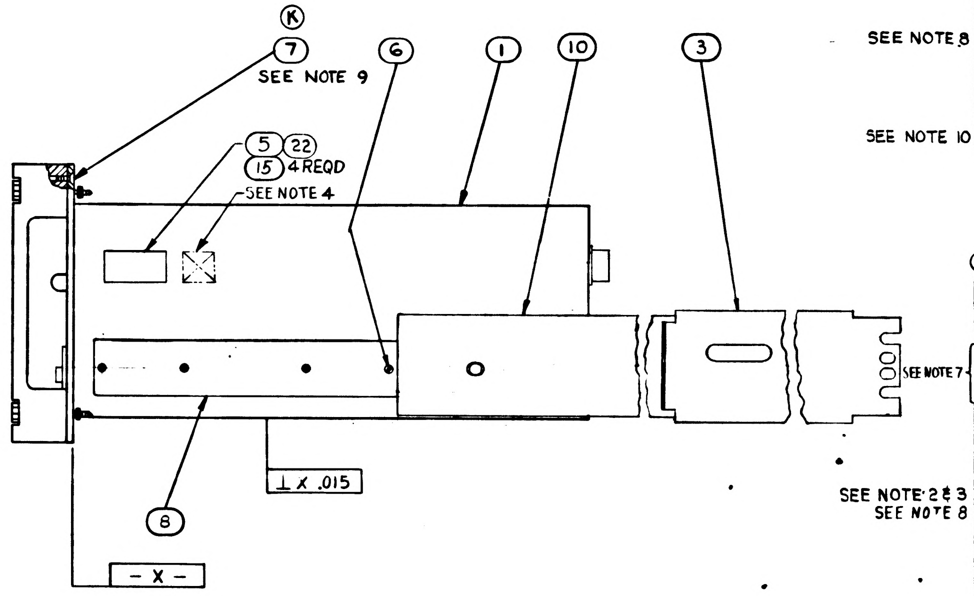




VIEW A-A

DETAIL A
1900049-021





		1	-	-		24		NAMEPLATE
		1	-	-		23	1900023-021	POWER SUPPLY, RELAY & LAMP
SEE NOTE 8		-	1			22	1901304-167	NAMEPLATE (AS APPLICABLE)
		2	2			21	MS 35233-28	SCREW, PAN HD
		2	2			20	MS 35338-41	WASHER, LOCK
		2	2			19	AN960-C6L	(1897006-036) WASHER, FLAT
		1	1			18	1902280	GUARD, CIRCUIT BREAKER
SEE NOTE 10		X	X	X		17	PS 1900049	PROCUREMENT SPECIFICATION

Ⓑ REPLACES REVISION "A" WITH CHANGE B

		AR	AR	AR		16	MIL-S-22473 GR H	(ES-2544-5) SEALING COMPOUND
		-	4	4		15	AN535-00-4	SCREW, DRIVE
		8	8	8		14	1016005-1	SHIM, LAMINATED
		4	4	4		13	1015796-001	BAR, SPACER
		4	4	4		12	1015790-001	BAR, NUT
		2	2	2		11	1015795-001	BRACKET, REAR SUPPORT
		1	1	1		10	1015794-001	SLIDE-INTERMEDIATE SECTION R.H.
		1	1	1		9	1015794-002	SLIDE-INTERMEDIATE SECTION L.H.
		2	2	2		8	1900250	SLIDE-FRONT SECTION-SPECIAL
		8	8	8		7	AN507C832R12	(1897003-[illegible]) SCREW, FLAT HD 100°
SEE NOTE 2 & 3		6	6	6		6	1015826-300	SCREW, FH, HEX SOCKET
SEE NOTE 8		-	-	1		5	1901304-122	NAMEPLATE (AS APPLICABLE)
		1	1	1		4	1015793-002	SLIDE-STATIONARY SECTION L.H.
		1	1	1		3	1015793-001	SLIDE-STATIONARY SECTION R.H.
		2	2	2		2	1900015-051	HANDLE ASSEMBLY
		-	1	1		1	1900023-011	POWER SUPPLY, RELAY AND LAMP
	QUANTITY REQUIRED	031	021	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
						LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON
1901976-011	1901976-011
1900004-021	1900004-021
1900004-011	1900004-011

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN

DRAWN	E. LITZOW	4 APR 63
CHECKED	MALEKOWSKI	15 APR 63
APPROVAL	R. RAHN	15 APR 63
APPROVAL	A.J. KODEL	15 APR 63

NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY RELAY AND LAMP
ASSEMBLY

CODE IDENT NO 99974
SIZE E
1900049
SCALE HALF
SHEET

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01118 **DATE** 5-1-63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
							SLIDES
			2			1900015-051	HANDLES
			1			1900023-011	POWER SUPPLY

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ — + — + —
− — − — − —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN E. LITZOW DATE 4-4-63
CHECKED 15 APR 63
APPROVAL 4-15-63
APPROVAL 15 APR 63
NASA APPROVAL 5-1-63
J P Gilmore 4-30-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

POWER SUPPLY
RELAY AND LAMP
ASSEMBLY

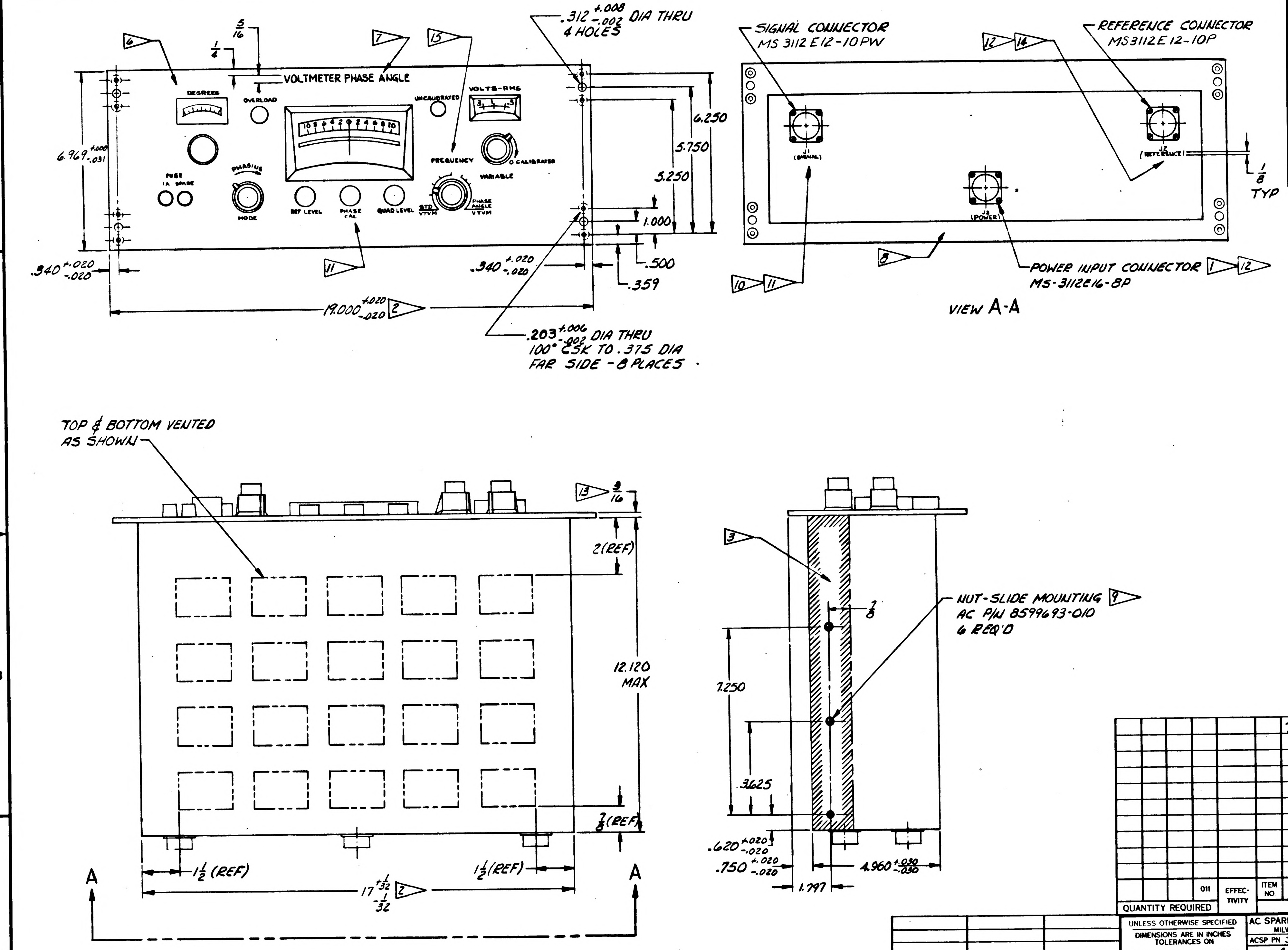
CODE IDENT NO.
SIZE C
1900049
SCALE —
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 1078C-P

0500061

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A,		ⓐ REVISED & REDRAWN 2 SHEETS WAS 1 SHEET	D.O.51284	22-JAN 63	V.M.
B,		REVISED CONNECTORS & NOTES.		25 FEB 63	SP
C,		ⓒ REVISED - ADDED NASA DRAWING NUMBER - SHEET 2 REDRAWN	D.O. 51427	5-APR 63	



VOLTMETER PHASE ANGLE
DEGREES
OVERLOAD
UNCALIBRATED
VOLTS-RMS
FREQUENCY
CALIBRATED
VARIABLE
FUSE 1A SPARE
PHASING
MODE
REF LEVEL
PHASE CAL
QUAD LEVEL
STD VTVM
PHASE ANGLE VTVM
.312 +.008 -.002 DIA THRU 4 HOLES
5/16
1/4
6.969 +.000 -.031
6.250
5.750
5.250
1.000
.500
.359
.340 +.020 -.020
19.000 +.020 -.020
.203 +.006 -.002 DIA THRU 100° CSK TO .375 DIA FAR SIDE - 8 PLACES
SIGNAL CONNECTOR MS 3112 E12-10PW
REFERENCE CONNECTOR MS3112E12-10P
J1 (SIGNAL)
J2 (REFERENCE)
J3 (POWER)
1/8 TYP
POWER INPUT CONNECTOR
MS-3112E16-8P
VIEW A-A
TOP & BOTTOM VENTED AS SHOWN
3/16
2 (REF)
12.120 MAX
7/8 (REF)
1 1/2 (REF)
17 +1/32 -1/32
A
NUT-SLIDE MOUNTING
AC P/N 8599693-010
6 REQ'D
2/8
7.250
3.625
.620 +.020 -.020
.750 +.020 -.020
1.797
4.960 +.030 -.030
2
3
6
7
9
10
11
12
13
14

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 DATE 24 Apr 64

QUANTITY REQUIRED					ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011	EFFECTIVITY			
						TO BE ASSIGNED	VOLTMETER (MODEL PAV-2R)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900036-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ 1/64 − 1/64	+.005 −.005	+2° −2°

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44299 (REF.)
DRAWN A.J. FLUDER 22-JAN-63
CHECKED Y. Molyz 25-JAN-63
APPROVAL PESKURIC 9 APR 63
APPROVAL A Fodel 9 APR 63
NASA APPROVAL 4/24/63
J P Helmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

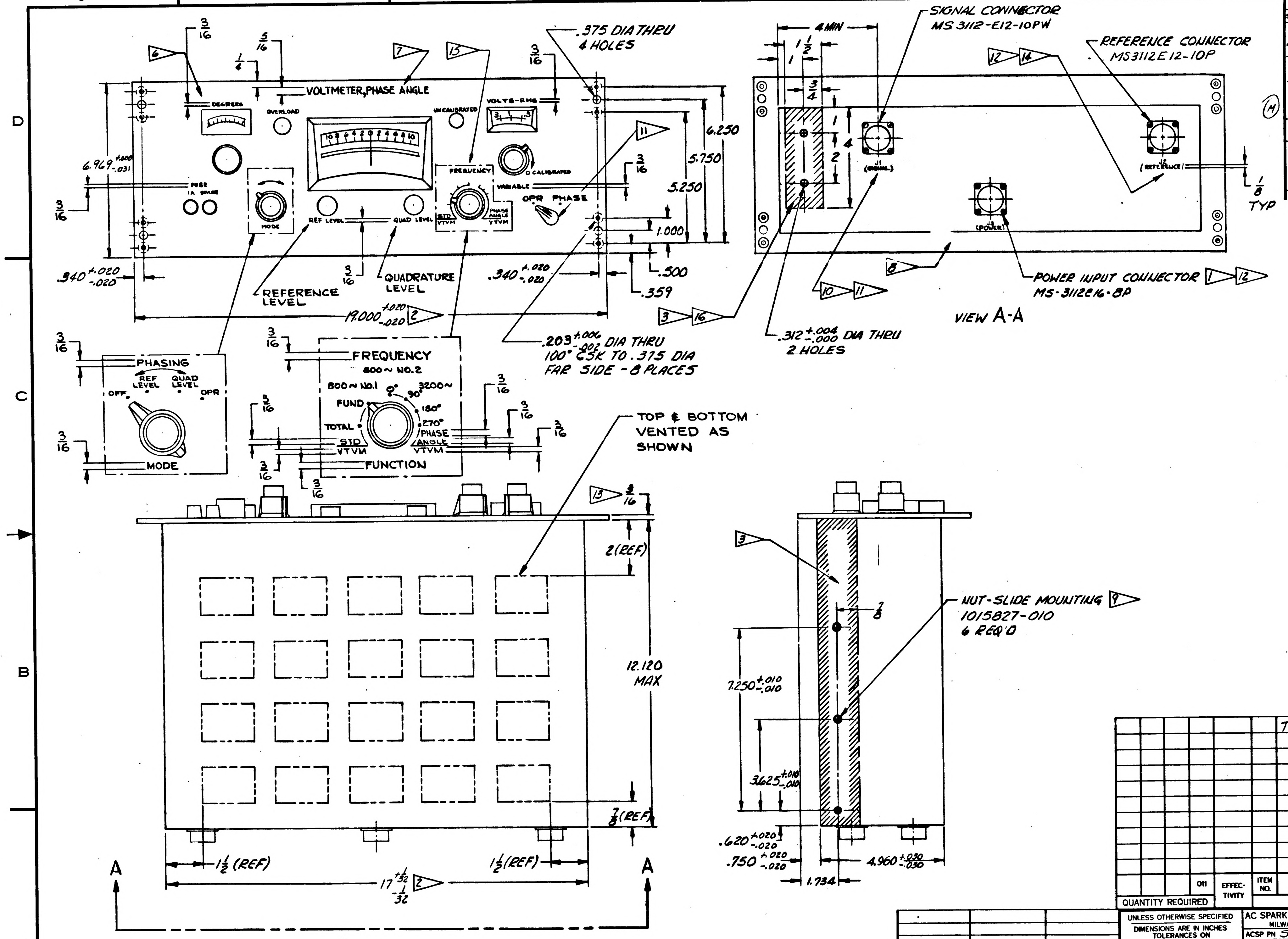
VOLTMETER - PHASE ANGLE

CODE IDENT NO.
SIZE D
1900050
SCALE 1:2
SHEET 1 OF 2

MIL 1077D-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1900050 2



VOLTMETER, PHASE ANGLE
DEGREES
OVERLOAD
UNCALIBRATED
VOLTS-RMS
FREQUENCY
0 CALIBRATED
VARIABLE
OPR PHASE
FUSE 1A SPARE
MODE
REF LEVEL
QUAD LEVEL
STD VTVM
PHASE ANGLE VTVM
.375 DIA THRU 4 HOLES
6.969 +.000 -.031
6.250
5.750
5.250
1.000
.500
.359
.340 +.020 -.020
REFERENCE LEVEL
QUADRATURE LEVEL
19.000 +.020 -.020
.203 +.006 -.002 DIA THRU 100° CSK TO .375 DIA FAR SIDE - 8 PLACES
3/16
5/16
1/4
PHASING
REF LEVEL
QUAD LEVEL
OFF
OPR
MODE
FREQUENCY
800~ NO.2
800~ NO.1
3200~
0°
90°
180°
270°
FUND
TOTAL
STD VTVM
PHASE ANGLE VTVM
FUNCTION
TOP & BOTTOM VENTED AS SHOWN
SIGNAL CONNECTOR MS 3112-E12-10PW
REFERENCE CONNECTOR MS3112E12-10P
4 MIN
1 1/2
1
3/4
4
2
J1 (SIGNAL)
J2 (REFERENCE)
J3 (POWER)
1/8 TYP
POWER INPUT CONNECTOR MS-3112E16-8P
.312 +.004 -.000 DIA THRU 2 HOLES
VIEW A-A
2 (REF)
12.120 MAX
7/8 (REF)
1 1/2 (REF)
17 1/32 -1/32
NUT-SLIDE MOUNTING 1015827-010 6 REQ'D
7/8
7.250 +.010 -.010
3.625 +.010 -.010
.620 +.020 -.020
.750 +.020 -.020
1.734
4.960 +.030 -.030
A
A
1
2
3
6
7
8
10
11
12
13
14
16

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A1		Ⓐ REVISED & REDRAWN 2 SHEETS WAS 1 SHEET	D.O.51284	22-JAN-63	A.J.F. / V.M.
B1		REVISED CONNECTORS & NOTES.		25 FEB 63	GP
C		Ⓒ REVISED · ADDED NASA DRAWING NUMBER - SHEET 2 REDRAWN	D.O. 51427	5-APR-63	A.J.F. / [illegible]
C1		CHANGE IN ACCORDANCE WITH MXC 186733	MXC 186733	24 MAY 63	[illegible]
D		CHANGE IN ACCORDANCE WITH MXC-188859 REVISION STATUS CHANGED PER TDRR 03712	—	9 AUG 63	JRK / [illegible] WK

Ⓜ

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 DATE 24 Apr 64

D	D
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
						TO BE ASSIGNED	VOLTMETER (MODEL PAV-2R)

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900036-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS $\pm\frac{1}{64}$ DECIMALS $\pm.005$ ANGLES $\pm 2°$
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44299 (REF)
DRAWN A.J. Fluder DATE 22-JAN-63
CHECKED W. J. Morley 25-JAN-63
APPROVAL Peskuric 7 APR 63
APPROVAL [illegible] 9 APR 63
NASA APPROVAL [illegible] 4/24/63
J P [illegible] 4-24-63
MIT APPROVAL [illegible] 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER - PHASE ANGLE

CODE IDENT NO. SIZE D 1900050
SCALE 1:2 SHEET 1 OF 2

MIL 10770-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1900050 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		CHANGE IN ACCORDANCE WITH MXC-188849 PER TDRR 03712		9 AUG 63 8 Oct 63	JRK WK

REQUIREMENTS :

ACCURACY : WHEN USED AS STANDARD VTVM MAX ERROR SHALL BE 2% OF FULL SCALE OVER A FREQUENCY RANGE OF 50 CPS TO 20 KC, AND 4% OF FULL SCALE OVER A FREQUENCY RANGE OF 20 KC TO 50 KC. WHEN USED AS A FUNDAMENTAL WAVE VTVM. MAX ERROR SHALL BE 2% OF FULL SCALE WHEN MEASURING CENTER FREQUENCY VOLTAGES, AND 3% OF FULL SCALE WHEN MEASURING VOLTAGES AT OTHER THAN CENTER FREQUENCY UP TO A MAX FREQUENCY DEVIATION OF ±5%. WHEN USED AS A PHASE SENSITIVE VOLTMETER. MAX ERROR SHALL BE 3% OF FULL SCALE WHEN MEASURING CENTER FREQUENCY VOLTAGES AND 4% OF FULL SCALE WHEN MEASURING VOLTAGES AT OTHER THAN CENTER FREQUENCY UP TO A MAXIMUM FREQUENCY DEVIATION OF 5%.

FREQUENCY RANGE : USED AS A STANDARD VTVM - 50 CPS TO 50 KC. USED AS A PHASE ANGLE VOLTMETER - THREE FIXED FREQUENCIES, 800 CPS, 800 CPS, 3200 CPS, SEE NOTE 15.

SIGNAL : INPUT IMPEDANCE : 500 K Ω (MIN)
INPUT ISOLATION : TRANSFORMER ISOLATED FROM THE CHASSIS. PRIMARY SHIELD CONNECTED TO PIN "D" IN THE SIGNAL CONNECTOR.
THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

REFERENCE : VOLTAGE : MINIMUM : 1 VOLT (RMS)
MAXIMUM : 125 VOLTS (RMS)
IMPEDANCE : 25,000 OHMS (MIN)
FREQUENCY : 800 CPS, 800 CPS, 3200 CPS
ISOLATION : TRANSFORMER ISOLATED PRIMARY SHIELD CONNECTED TO PIN "H" IN REFERENCE CONNECTOR
THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

NET WEIGHT : 23 LBS (APPROX)

THIS INSTRUMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900050.

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

SCALE : ZERO CENTER. SHALL BE MIRROR BACKED.

KNOBS SHALL BE PER MS91528, TYPE "F" OR TYPE "K" WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

GROUNDING : SIGNAL, REFERENCE, POWER SOURCE AND CHASSIS MUST BE ELECTRICALLY ISOLATED FROM EACH OTHER. THE CHASSIS AND THE LOW SIDE OF EACH LINE WILL BE GROUNDED TOGETHER EXTERNALLY.

PHASE ANGLE DIAL ACCURACY : MAX. ERROR SHALL BE 1°

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION PROCEDURES SHALL BE SUPPLIED WITH EACH UNIT. A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

POWER : 115 VOLTS ± 10V, 60 ± 5 CPS, 60 VA MAX.

REQUIREMENTS CONTINUED :

VOLTAGE RATING : FROM 1MV TO 300 VOLTS FULL SCALE IN THE FOLLOWING 12 STEP SEQUENCE : .001, .003, .010, .030, .100, .300, 1, 3, 10, 30, 100, 300 VOLTS (RMS).

2 ▷ 17 AND 19.000 INCH DIMENSIONS OF CHASSIS AND PANEL TO BE CENTRALIZED AT ASSEMBLY WITHIN .020 INCH. SIDES OF CHASSIS, LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF PANEL WITHIN .062.

3 ▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA.

6 ▷ FINISH : APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO FRONT AND EDGES OF PANEL. APPLY 2 COATS OF TT-E-529A CLASS B, ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD 595.
NOTE : MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

7 ▷ CHARACTERS : FUTURA DEMIBOLD PER ND 1002122, CHARACTER HEIGHT 1/8, EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN. MARKING OF REFERENCE DESIGNATION CHARACTERS OF DIMENSIONS SHOWN, TO BE APPLIED PER ND 1002019.

8 ▷ BORDER AREA WITHIN 9/16 INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

9 ▷ MOUNT NUT FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

10 ▷ SIGNAL (J1) CONNECTOR PIN IDENTIFICATION (MS-3112E12-10PW)

PIN	CONNECT TO
A	OPEN
B	HI
C	LO
D	SHIELD GROUND
E, F, G H, J, K	OPEN

11 ▷ PHASE CALIBRATION : IT SHALL BE POSSIBLE TO CONNECT THE REFERENCE INPUT TO THE SIGNAL INPUT MOMENTARILY FOR CALIBRATION PURPOSES. THE CONTROL SHALL BE A FRONT PANEL SWITCH.

12 ▷ EXACT CONNECTOR LOCATION ON REAR OF ASSEMBLY IS TO BE DETERMINED BY THE SUPPLIER.

13 ▷ FRONT PANEL MATERIAL : 3/16 ALUMINUM 5052H32. (QQ-A-318)

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

14 ▷ REFERENCE (J2) CONNECTOR PIN IDENTIFICATION (MS3112E12-10P)

PIN	CONNECT TO
A	OPEN
B	HI 800 CPS - #1
C	LO 800 CPS - #1
D	HI 3200 CPS
E	LO 3200 CPS
F	HI 800 CPS - #2
G	LO 800 CPS - #2
H	SHIELD GROUND
J, K	OPEN

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 DATE 24 Apr 63

15 ▷ THERE SHALL BE THREE SEPERATE REFERENCE VOLTAGE INPUTS (SEE NOTE 14 FOR CONNECTOR PINS); THEY ARE AS FOLLOWS:
1. 800 CPS REFERENCE #1
2. 800 CPS REFERENCE #2
3. 3200 CPS REFERENCE

THE THREE DISCRETE REFERENCE VOLTAGES SHALL ENTER THE INSTRUMENT AND TERMINATE ON A DECK OF THE "FREQUENCY" CONTROL SWITCH. SWITCHING OF THE FILTERS SHALL SIMULTANEOUSLY CONNECT THE PROPER REFERENCE TO THE REFERENCE ISOLATION TRANSFORMER PRIMARY. THE 800 CYCLE FILTER-SET SHALL BE USED FOR BOTH 800 CPS REFERENCE VOLTAGE INPUTS

DATA SOURCE :
GERTSCH PRODUCTS INC.
3211 SO. LA CIENGA BOULEVARD
LOS ANGELES 16, CALIFORNIA
PHASE ANGLE VOLTMETER PAV-2R

16 ▷ IN THE INDICATED AREA, 1/2 IN CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACE.

1 ▷ POWER (J3) CONNECTOR PIN IDENTIFICATION (MS-3112E16-8P)

PIN	CONNECT TO
A	CHASSIS
B, C	OPEN
D	POWER HI
E	POWER LO
F, G, H	OPEN

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44299
DRAWN A. J. FLUDER DATE 22-JAN-63
CHECKED V. MOYLE 25 JAN 63
APPROVAL G. J. PESKURIC 9 APR. 63
APPROVAL 9 APR 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL WK 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER - PHASE ANGLE

CODE IDENT NO.
SIZE D
1900050
SCALE —
SHEET 2 OF 2

MIL 1077D—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
REVISIONS					
D		CHANGE IN ACCORDANCE WITH MXC-188849 PER TDRR 03712		9 AUG 63 8 Aug 63	JRK WK
E	A-6	REM'D NOTE 12▷ "EXACT CONN LOC ON REAR OF ASSY IS TO BE DETERMINED BY THE SUPPLIER," PER MXC 192072		18 OCT 63	A.K.
F		CHANGE IN ACCORDANCE WITH CM 193212 PER TDRR 08202		7 JAN 64	LA

REQUIREMENTS :

ACCURACY : WHEN USED AS STANDARD VTVM MAX ERROR SHALL BE 2% OF FULL SCALE OVER A FREQUENCY RANGE OF 200 CPS TO 3200 CPS AND 5% OF FULL SCALE OVER A FREQUENCY RANGE OF 3200 CPS TO 17.5 KC. THE MAX ERROR SHALL BE LESS THAN 10% OF FULL SCALE OVER A FREQUENCY RANGE OF 17.5 KC TO 25 KC. WHEN USED AS A PHASE SENSITIVE VOLTMETER MAX ERROR SHALL BE 3% OF FULL SCALE WHEN MEASURING CENTER FREQUENCY VOLTAGES AND 4% OF FULL SCALE WHEN MEASURING VOLTAGES AT OTHER THAN CENTER FREQUENCY UP TO A MAXIMUM FREQUENCY DEVIATION OF 5%.

FREQUENCY RANGE : USED AS A STANDARD VTVM - 200 CPS TO 25 KC. USED AS A PHASE ANGLE VOLTMETER - THREE FIXED FREQUENCIES, 800 CPS., 800 CPS, 3200 CPS, SEE NOTE 15▷.

SIGNAL : INPUT IMPEDANCE : 500 K Ω (MIN)
INPUT ISOLATION : TRANSFORMER ISOLATED FROM THE CHASSIS. PRIMARY SHIELD CONNECTED TO PIN "D" IN THE SIGNAL CONNECTOR.
THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

REFERENCE : VOLTAGE : MINIMUM : 1 VOLT (RMS)
MAXIMUM : 125 VOLTS (RMS)
INPEDANCE : 25,000 OHMS (MIN)
FREQUENCY : 800 CPS, 800 CPS, 3200 CPS
ISOLATION : TRANSFORMER ISOLATED
PRIMARY SHIELD CONNECTED TO PIN "H" IN REFERENCE CONNECTOR
THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

NET WEIGHT : 23 LBS (APPROX)

THIS INSTRUMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900050 .

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

SCALE : ZERO CENTER. SHALL BE MIRROR BACKED.

KNOBS SHALL BE PER MS91528, TYPE "F" OR TYPE "K" WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

GROUNDING : SIGNAL, REFERENCE, POWER SOURCE AND CHASSIS MUST BE ELECTRICALLY ISOLATED FROM EACH OTHER. THE CHASSIS AND THE LOW SIDE OF EACH LINE WILL BE GROUNDED TOGETHER EXTERNALLY.

PHASE ANGLE DIAL ACCURACY : MAX. ERROR SHALL BE 1°

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION PROCEDURES SHALL BE SUPPLIED WITH EACH UNIT. A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

POWER : 115 VOLTS ± 10V , 60 ± 5 CPS, 60 VA MAX.

REQUIREMENTS CONTINUED :

VOLTAGE RATING : FROM 1MV TO 300 VOLTS FULL SCALE IN THE FOLLOWING 12 STEP SEQUENCE : .001, .003, .010, .030, .100, .300, 1, 3, 10, 30, 100, 300 VOLTS (RMS).

2▷ 17 AND 19.000 INCH DIMENSIONS OF CHASSIS AND PANEL TO BE CENTRALIZED AT ASSEMBLY WITHIN .020 INCH. SIDES OF CHASSIS, LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF PANEL WITHIN .062.

3▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA.

6▷ FINISH : APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO FRONT AND EDGES OF PANEL. APPLY 2 COATS OF TT-E-529A CLASS B, ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD 595.
NOTE : MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

7▷ CHARACTERS : FUTURA DEMIBOLD PER ND1002122, CHARACTER HEIGHT 1/8, EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK. COLOR 514 OF ANA 157, EXCEPT WHEN CONTRASTING COLOR IS NEEDED FOR COLOR CODING. CENTRALIZE AS SHOWN. MARKING OF REFERENCE DESIGNATION CHARACTERS OF DIMENSIONS SHOWN, TO BE APPLIED PER ND 1002019.

8▷ BORDER AREA WITHIN 9/16 INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

9▷ MOUNT NUT FROM THE INSIDE OF THE CHASSIS. ALLOW 3/8 IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

10▷ SIGNAL (J1) CONNECTOR PIN IDENTIFICATION (MS-3112E12-10PW)

PIN	CONNECT TO
A	OPEN
B	HI
C	LO
D	SHIELD GROUND
E, F, G H, J, K	OPEN

11▷ PHASE CALIBRATION : IT SHALL BE POSSIBLE TO CONNECT THE REFERENCE INPUT TO THE SIGNAL INPUT MOMENTARILY FOR CALIBRATION PURPOSES. THE CONTROL SHALL BE A FRONT PANEL SWITCH.

13▷ FRONT PANEL MATERIAL : 3/16 ALUMINUM 5052H32. (QQ-A-318)

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

14▷ REFERENCE (J2) CONNECTOR PIN IDENTIFICATION (MS3112E12-10P)

PIN	CONNECT TO
A	OPEN
B	HI 800 CPS - #1
C	LO 800 CPS - #1
D	HI 3200 CPS
E	LO 3200 CPS
F	HI 800 CPS - #2
G	LO 800 CPS - #2
H	SHIELD GROUND
J, K	OPEN

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 **DATE** 24 Sep 63

15▷ THERE SHALL BE THREE SEPERATE REFERENCE VOLTAGE INPUTS (SEE NOTE 14▷ FOR CONNECTOR PINS); THEY ARE AS FOLLOWS:
1. 800 CPS REFERENCE #1
2. 800 CPS REFERENCE #2
3. 3200 CPS REFERENCE

THE THREE DISCRETE REFERENCE VOLTAGES SHALL ENTER THE INSTRUMENT AND TERMINATE ON A DECK OF THE "FREQUENCY" CONTROL SWITCH. SWITCHING OF THE FILTERS SHALL SIMULTANEOUSLY CONNECT THE PROPER REFERENCE TO THE REFERENCE ISOLATION TRANSFORMER PRIMARY. THE 800 CYCLE FILTER-SET SHALL BE USED FOR BOTH 800 CPS REFERENCE VOLTAGE INPUTS

DATA SOURCE :
GERTSCH PRODUCTS INC.
3211 SO. LA CIENGA BOULEVARD
LOS ANGELES 16, CALIFORNIA
PHASE ANGLE VOLTMETER PAV-2R

16▷ IN THE INDICATED AREA, 1/2 IN CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACE.

1▷ POWER (J3) CONNECTOR PIN IDENTIFICATION (MS-3112E16-8P)

PIN	CONNECT TO
A	CHASSIS
B, C	OPEN
D	POWER HI
E	POWER LO
F, G, H	OPEN

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — DECIMALS + — — ANGLES + — —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

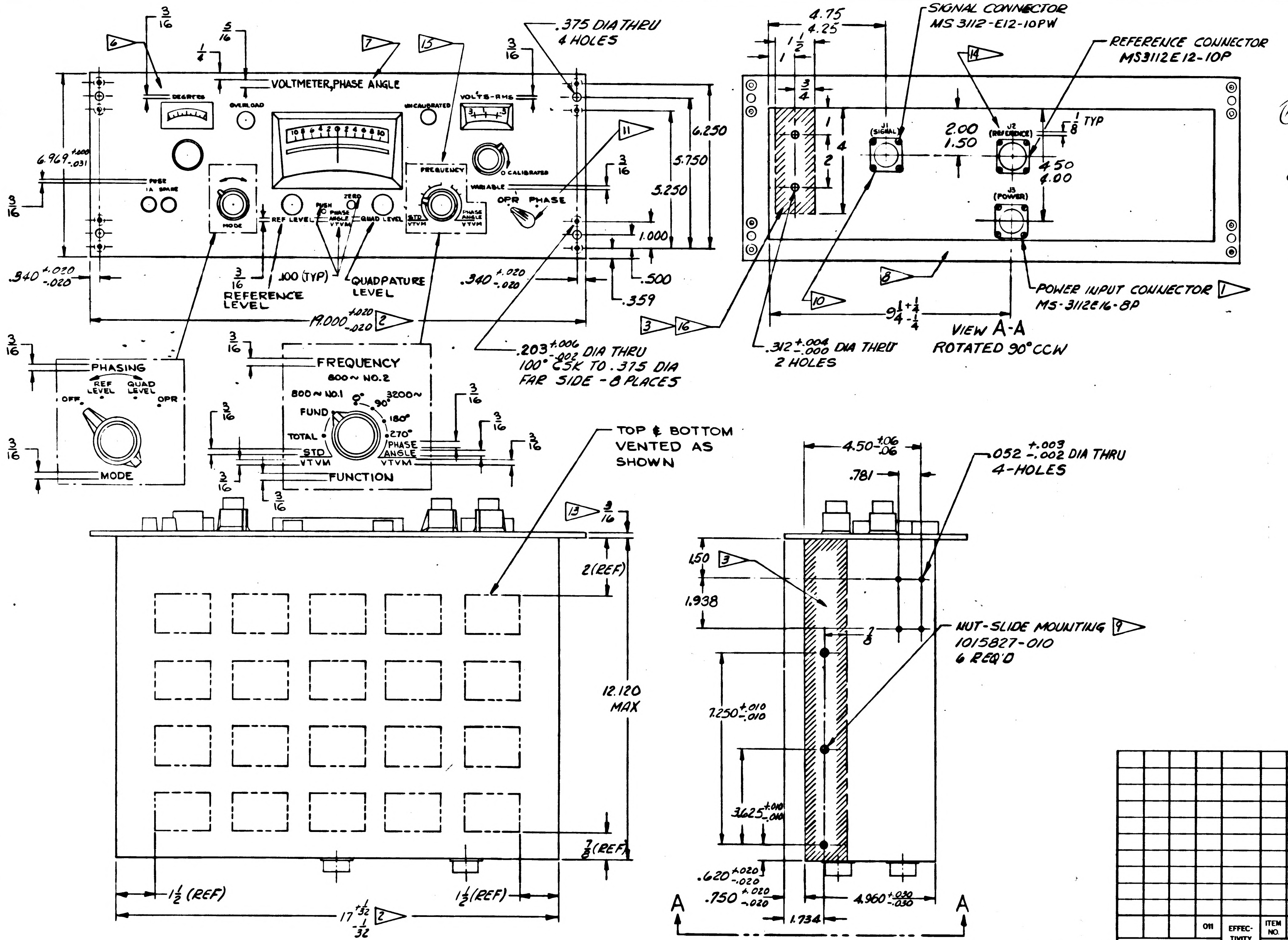
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK 44299
DRAWN A. J. FLUDER DATE 22-JAN-63
CHECKED V. MOYLE 25 JAN 63
APPROVAL G. J. PESAVERA 9 APR. 63
APPROVAL 9 APR 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER - PHASE ANGLE

CODE IDENT NO.
SIZE D
1900050
SCALE —
SHEET 2 OF 2

MIL 10770-P


VOLTMETER PHASE ANGLE
DEGREES
OVERLOAD
UNCALIBRATED
VOLTS-RMS
FUSE
1A SPARE
MODE
REF LEVEL
PUSH TO PHASE ANGLE VTVM
ZERO
QUAD LEVEL
FREQUENCY
STD VTVM
PHASE ANGLE VTVM
O CALIBRATED
VARIABLE
OPR PHASE
.375 DIA THRU 4 HOLES
6.969 +.000 -.031
6.250
5.750
5.250
1.000
.500
.359
.340 +.020 -.020
.100 (TYP)
REFERENCE LEVEL
QUADPATURE LEVEL
19.000 +.020 -.020
.203 +.006 -.002 DIA THRU 100° CSK TO .375 DIA FAR SIDE - 8 PLACES
PHASING
REF LEVEL
QUAD LEVEL
OFF
OPR
FREQUENCY
800~ NO.2
800~ NO.1
3200~
FUND
TOTAL
0°
90°
180°
270°
STD VTVM
PHASE ANGLE VTVM
FUNCTION
SIGNAL CONNECTOR MS 3112-E12-10PW
REFERENCE CONNECTOR MS3112E12-10P
4.75
4.25
1 1/2
1
3/4
4
2
2.00
1.50
1/8 TYP
4.50
4.00
J1 (SIGNAL)
J2 (REFERENCE)
J3 (POWER)
POWER INPUT CONNECTOR MS-3112E16-8P
9 1/4 +1/4 -1/4
.312 +.004 -.000 DIA THRU 2 HOLES
VIEW A-A ROTATED 90° CCW
TOP & BOTTOM VENTED AS SHOWN
2 (REF)
12.120 MAX
7/8 (REF)
1 1/2 (REF)
17 +1/32 -1/32
4.50 +.06 -.06
.781
.052 +.003 -.002 DIA THRU 4-HOLES
1.50
1.938
NUT-SLIDE MOUNTING 1015827-010 6 REQ'D
7.250 +.010 -.010
3.625 +.010 -.000
.620 +.020 -.020
.750 +.020 -.020
1.734
4.960 +.030 -.030
A
A
1
2
3
6
7
8
9
10
11
13
14
16

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		REVISED & REDRAWN 2 SHEETS WAS 1 SHEET	D.O.51284	22 JAN 63	A.J.F. V.M.
B		Revised Connectors & Notes.		25 FEB 63	JP
C		REVISED - ADDED NASA DRAWING NUMBER - SHEET 2 REDRAWN	D.O. 51427	5 APR 63	A.J.F. J.P.
C-1		CHANGE IN ACCORDANCE WITH MXC 186733	MXC 186733	24 MAY 63	J.P.
D		CHANGE IN ACCORDANCE WITH MXC-188859 REVISION STATUS CHANGED PER TDRR 03712	—	9 AUG 63	JRK
E		CHANGE IN ACCORDANCE WITH MXC 192072		18 OCT 63	P.K.
F	C-4 D-7	REMD FLAG 11 FROM SIGNAL CONN. REVISED FRONT VIEW OF PANEL PER CM 193212 PER TDRR 08202		7 JAN 64	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 DATE 24 Jan 64

SHEET 1	SHEET 2
F	F
E	E
C	D

REVISION STATUS OF SHEETS

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
							TO BE ASSIGNED	VOLTMETER (MODEL PAV-2R)

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900036-011		

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64	+.005	+2°
-1/64	-.005	-2°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK442991 (REF)
DRAWN A.J.Fluber 22-JAN-63 DATE
CHECKED W. J. Nolze 25-JAN-63
APPROVAL Eskuric 9 APR 63
APPROVAL 9 APR 63
NASA APPROVAL 4/24/63
MIT APPROVAL 24 Apr 63

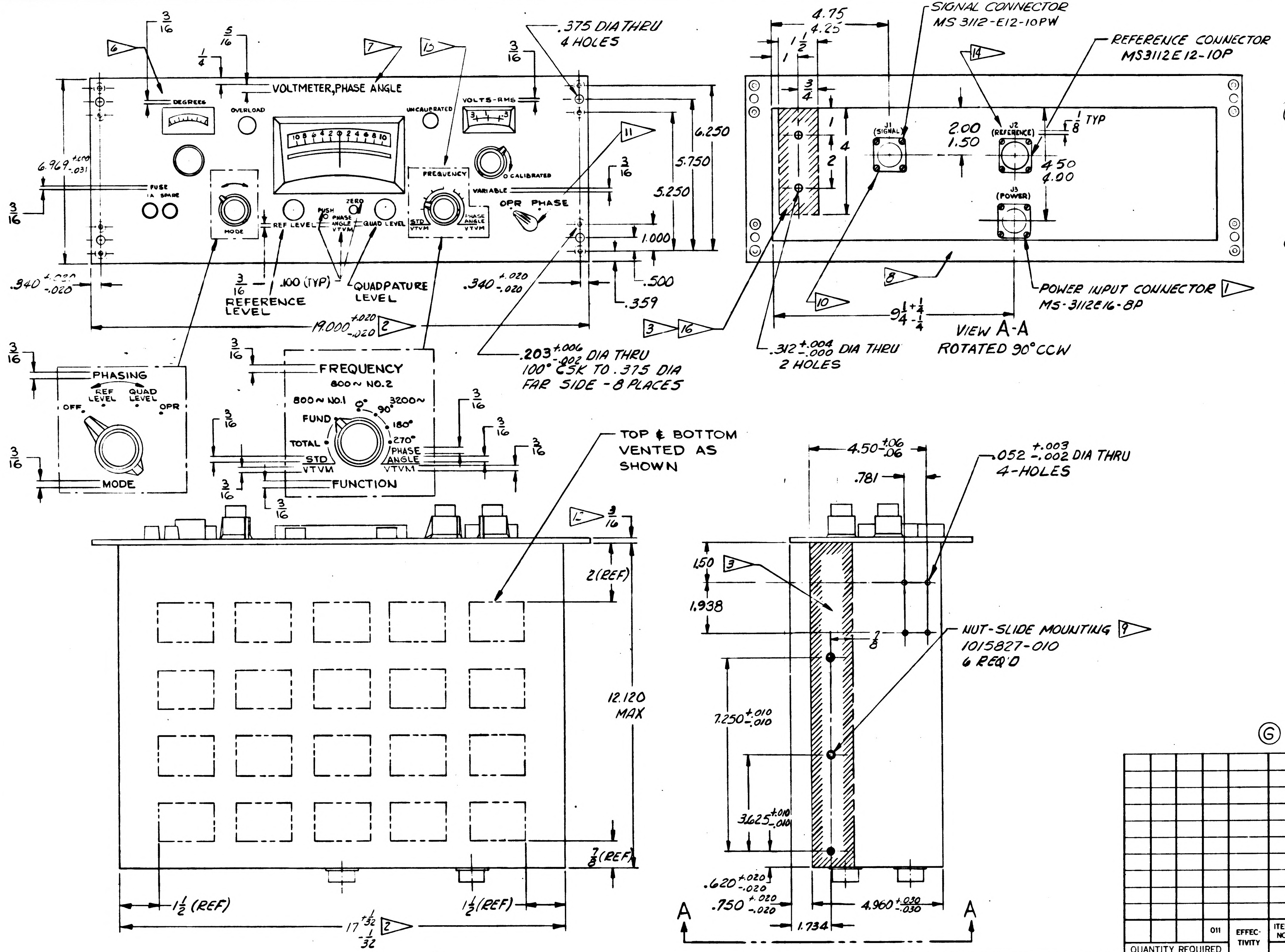
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER - PHASE ANGLE

CODE IDENT NO.
SIZE D
1900050
SCALE 1:2
SHEET 1 OF 2

MIL 1077D-P

1900050



VOLTMETER, PHASE ANGLE
DEGREES
OVERLOAD
UNCALIBRATED
VOLTS-RMS
CALIBRATED
FUSE
FREQUENCY
VARIABLE
OPR PHASE
MODE
REF LEVEL
PUSH
ZERO
PHASE ANGLE VTVM
QUAD LEVEL
STD VTVM
.375 DIA THRU
4 HOLES
6.969 +.000 -.031
6.250
5.750
5.250
1.000
.500
.359
.340 +.020 -.020
.100 (TYP)
REFERENCE LEVEL
QUADRATURE LEVEL
19.000 +.020 -.020
3/16
5/16
1/4
.203 +.006 -.002 DIA THRU
100° CSK TO .375 DIA
FAR SIDE - 8 PLACES
PHASING
REF LEVEL
QUAD LEVEL
OFF
OPR
MODE
FREQUENCY
800~ NO.2
800~ NO.1
3200~
FUND
0°
90°
180°
270°
TOTAL
STD VTVM
PHASE ANGLE VTVM
FUNCTION
4.75
4.25
1 1/2
1
3/4
4
2
SIGNAL CONNECTOR
MS 3112-E12-10PW
REFERENCE CONNECTOR
MS3112E12-10P
J1 (SIGNAL)
J2 (REFERENCE)
J3 (POWER)
2.00
1.50
1/8 TYP
4.50
4.00
POWER INPUT CONNECTOR
MS-3112E16-8P
9 1/4 +1/4 -1/4
.312 +.004 -.000 DIA THRU
2 HOLES
VIEW A-A
ROTATED 90° CCW
TOP & BOTTOM
VENTED AS
SHOWN
2 (REF)
12.120 MAX
7/8 (REF)
1 1/2 (REF)
17 +1/32 -1/32
4.50 +.06 -.06
.781
.052 +.003 -.002 DIA THRU
4-HOLES
1.50
1.938
NUT-SLIDE MOUNTING
1015827-010
6 REQ'D
7.250 +.010 -.010
3.625 +.010 -.010
.620 +.020 -.020
.750 +.020 -.020
1.734
4.960 +.030 -.030
A
A

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
H,		Ⓗ REVISED & REDRAWN 2 SHEETS WAS 1 SHEET	D.O. 51254	JAN 63	
B,		REVISED CONNECTORS & NOTES		25 FEB 63	
C		Ⓒ REVISED - ADDED NASA DRAWING NUMBER - SHEET 2 REDRAWN	D.O. 51427	5 APR 63	
C-1		CHANGE IN ACCORDANCE WITH MXC 186733	MXC 186733	24 MAY 63	
D		CHANGE IN ACCORDANCE WITH MXC-188859 REVISION STATUS CHANGED PER TDRR 03712	—	9 AUG 63	JRK
E		CHANGE IN ACCORDANCE WITH MXC 192072		18 OCT 63	D.K.
F	C-4 D-7	REMD FLAG 11 FROM SIGNAL CONN. REVISED FRONT VIEW OF PANEL PER CM 193212 PER TDRR 08202		7 JAN 64	
G		REPLACED WITH CHANGE BY REV H PER TDRR 20217		26 JUN 65	REW

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 DATE 24 Apr 64

G	G
F	F
E	E
D	D
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓖ REPLACED WITH CHANGE BY REV H

						TO BE ASSIGNED	VOLTMETER (MODEL PAV-2R)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900036-011		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+1/64 -1/64	+.005 -.005	+2° -2°

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN SK44299 (REF)
DRAWN A.J. Fluder 22-JAN-63
CHECKED 25-JAN-63
APPROVAL 9 APR 63
APPROVAL 9 APR 63
NASA APPROVAL 4/24/63
4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER - PHASE ANGLE

CODE IDENT NO. 99974
SIZE D
1900050
SCALE 1:2
SHEET 1 OF 2

1900050

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D		CHANGE IN ACCORDANCE WITH MXC-188849 PER TDRR 02712		9 AUG 63 8 AUG 63	JRK WK
E	A-6	REM'D NOTE 12▷ "EXACT CONN LOC ON REAR OF ASSY IS TO BE DETERMINED BY THE SUPPLIER," PER MXC 192072		18 OCT 63	A.K. EAJ
F		CHANGE IN ACCORDANCE WITH CM 193212 PER TDRR 08202		7 JAN 64	LA ETB
G		REPLACED WITH CHANGE BY REV H PER TDRR 20217		26 JUN 65	REW PF

REQUIREMENTS :

ACCURACY : WHEN USED AS STANDARD VTVM MAX ERROR SHALL BE 2% OF FULL SCALE OVER A FREQUENCY RANGE OF 200 CPS TO 3200 CPS AND 5% OF FULL SCALE OVER A FREQUENCY RANGE OF 3200 CPS TO 17.5 KC. THE MAX ERROR SHALL BE LESS THAN 10% OF FULL SCALE OVER A FREQUENCY RANGE OF 17.5 KC TO 25 KC. WHEN USED AS A PHASE SENSITIVE VOLTMETER MAX ERROR SHALL BE 3% OF FULL SCALE WHEN MEASURING CENTER FREQUENCY VOLTAGES AND 4% OF FULL SCALE WHEN MEASURING VOLTAGES AT OTHER THAN CENTER FREQUENCY UP TO A MAXIMUM FREQUENCY DEVIATION OF 5%.

FREQUENCY RANGE : USED AS A STANDARD VTVM - 200 CPS TO 25 KC. USED AS A PHASE ANGLE VOLTMETER - THREE FIXED FREQUENCIES, 800 CPS, 800 CPS, 3200 CPS, SEE NOTE 15▷.

SIGNAL : INPUT IMPEDANCE : 500 K Ω (MIN)

INPUT ISOLATION : TRANSFORMER ISOLATED FROM THE CHASSIS. PRIMARY SHIELD CONNECTED TO PIN "D" IN THE SIGNAL CONNECTOR.

THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

REFERENCE : VOLTAGE : MINIMUM : 1 VOLT (RMS)
MAXIMUM : 125 VOLTS (RMS)
INPEDANCE : 25,000 OHMS (MIN)
FREQUENCY : 800 CPS, 800 CPS, 3200 CPS
ISOLATION : TRANSFORMER ISOLATED PRIMARY SHIELD CONNECTED TO PIN "H" IN REFERENCE CONNECTOR
THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

NET WEIGHT: 23 LBS (APPROX)

THIS INSTRUMENT SHALL PASS ALL TESTS CALLED OUT IN ATP 1900050.

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

SCALE : ZERO CENTER. SHALL BE MIRROR BACKED.

KNOBS SHALL BE PER MS91528, TYPE "F" OR TYPE "K" WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

GROUNDING : SIGNAL, REFERENCE, POWER SOURCE AND CHASSIS MUST BE ELECTRICALLY ISOLATED FROM EACH OTHER. THE CHASSIS AND THE LOW SIDE OF EACH LINE WILL BE GROUNDED TOGETHER EXTERNALLY.

PHASE ANGLE DIAL ACCURACY : MAX. ERROR SHALL BE 1°

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION PROCEDURES SHALL BE SUPPLIED WITH EACH UNIT. A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

POWER: 115 VOLTS ± 10V, 60 ± 5 CPS, 60 VA MAX.

REQUIREMENTS CONTINUED :

VOLTAGE RATING : FROM 1MV TO 300 VOLTS FULL SCALE IN THE FOLLOWING 12 STEP SEQUENCE : .001, .003, .010, .030, .100, .300, 1, 3, 10, 30, 100, 300 VOLTS (RMS).

2▷ 17 AND 19.000 INCH DIMENSIONS OF CHASSIS AND PANEL TO BE CENTRALIZED AT ASSEMBLY WITHIN .020 INCH. SIDES OF CHASSIS, LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF PANEL WITHIN .062.

3▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA.

6▷ FINISH : APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO FRONT AND EDGES OF PANEL. APPLY 2 COATS OF TT-E-529A CLASS B, ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD 595.
NOTE : MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

7▷ CHARACTERS : FUTURA DEMIBOLD PER ND 1002122, CHARACTER HEIGHT $\frac{1}{8}$, EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157, EXCEPT WHEN CONTRASTING COLOR IS NEEDED FOR COLOR CODING. CENTRALIZE AS SHOWN. MARKING OF REFERENCE DESIGNATION CHARACTERS OF DIMENSIONS SHOWN, TO BE APPLIED PER ND 1002019.

8▷ BORDER AREA WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

9▷ MOUNT NUT FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{3}{8}$ IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

10▷ SIGNAL (J1) CONNECTOR PIN IDENTIFICATION (MS-3112E12-10PW)

PIN	CONNECT TO
A	OPEN
B	HI
C	LO
D	SHIELD GROUND
E, F, G H, J, K	OPEN

11▷ PHASE CALIBRATION : IT SHALL BE POSSIBLE TO CONNECT THE REFERENCE INPUT TO THE SIGNAL INPUT MOMENTARILY FOR CALIBRATION PURPOSES. THE CONTROL SHALL BE A FRONT PANEL SWITCH.

13▷ FRONT PANEL MATERIAL : $\frac{3}{16}$ ALUMINUM 5052H32. (QQ-A-318)

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

14▷ REFERENCE (J2) CONNECTOR PIN IDENTIFICATION (MS3112E12-10P)

PIN	CONNECT TO
A	OPEN
B	HI 800 CPS - #1
C	LO 800 CPS - #1
D	HI 3200 CPS
E	LO 3200 CPS
F	HI 800 CPS - #2
G	LO 800 CPS - #2
H	SHIELD GROUND
J, K	OPEN

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 **DATE** 24 Apr 63

15▷ THERE SHALL BE THREE SEPERATE REFERENCE VOLTAGE INPUTS (SEE NOTE 14▷ FOR CONNECTOR PINS); THEY ARE AS FOLLOWS:

1. 800 CPS REFERENCE #1
2. 800 CPS REFERENCE #2
3. 3200 CPS REFERENCE

THE THREE DISCRETE REFERENCE VOLTAGES SHALL ENTER THE INSTRUMENT AND TERMINATE ON A DECK OF THE "FREQUENCY" CONTROL SWITCH. SWITCHING OF THE FILTERS SHALL SIMULTANEOUSLY CONNECT THE PROPER REFERENCE TO THE REFERENCE ISOLATION TRANSFORMER PRIMARY. THE 800 CYCLE FILTER-SET SHALL BE USED FOR BOTH 800 CPS REFERENCE VOLTAGE INPUTS

DATA SOURCE:
GERTSCH PRODUCTS INC.
3211 SO. LA CIENGA BOULEVARD
LOS ANGELES 16, CALIFORNIA
PHASE ANGLE VOLTMETER PAV-2R

16▷ IN THE INDICATED AREA, $\frac{1}{2}$ IN CLEARANCE SHALL BE PROVIDED FROM THE INSIDE PANEL SURFACE.

1▷ POWER (J3) CONNECTOR PIN IDENTIFICATION (MS-3112E16-8P)

PIN	CONNECT TO
A	CHASSIS
B, C	OPEN
D	POWER HI
E	POWER LO
F, G, H	OPEN

Ⓖ **REPLACED WITH CHANGE BY REV H**

NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ —	+ —
− —	− —	− —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE, WISCONSIN

ACSP PN SK 44299

DRAWN A. J. FLUDER DATE 22-JAN-63
CHECKED W.L. V. MOYLE 25 JAN 63
APPROVAL G. J. PESNURE 9 APR 63
APPROVAL 9 APR 63
NASA APPROVAL 4/24/63 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER - PHASE ANGLE

CODE IDENT NO	SIZE	
99974	D	1900050
SCALE —		SHEET 2 OF 2

MIL 1077D-P

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

REQUIREMENTS:

VOLTAGE RATING: FROM 1 MV TO 300 VOLTS FULL SCALE IN THE FOLLOWING 12 STEP SEQUENCE: .001, .003, .010, .030, .100, .300, 1, 3, 10, 30, 100, 300 VOLTS (RMS).

ACCURACY: ± 2% OF FULL SCALE WHEN USED AS A STANDARD VTVM.
± 3% OF FULL SCALE WHEN USED AS A PHASE-SENSITIVE VOLTMETER.

FREQUENCY RANGE: USED AS A STANDARD VTVM - 50 CPS TO 50 KC.
USED AS PHASE ANGLE VOLTMETER - THREE FIXED FREQUENCIES, 800 CPS, 800 CPS, 3200 CPS, SEE NOTE 15▷. PHASE ANGLE VOLTMETER SHALL MAINTAIN ITS ACCURACY WHILE FREQUENCY VARIES ± 4% FROM THE CENTER FREQUENCY.

PHASE ANGLE DIAL ACCURACY: ± 1°

SIGNAL: INPUT IMPEDANCE: 1 MEGOHM (MIN).
INPUT ISOLATION: TRANSFORMER ISOLATED FROM THE CHASSIS. PRIMARY SHIELD CONNECTED TO PIN "D" IN THE SIGNAL CONNECTOR.
THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

REFERENCE: VOLTAGE: MINIMUM: 1 VOLT (RMS)
MAXIMUM: 125 VOLTS (RMS)
INPEDANCE: 25,000 OHMS (MIN)
FREQUENCY: 800 CPS, 800 CPS, 3200 CPS
ISOLATION: TRANSFORMER ISOLATED PRIMARY SHIELD CONNECTED TO PIN "H" IN REFERENCE CONNECTOR
THE INSTRUMENT SHALL PROVIDE BLOCKING TO DC INPUTS UP TO 300V.

NET WEIGHT:

THIS INSTRUMENT SHALL PASS ALL TESTS CALLED OUT IN (ES-) ND

THE SUPPLIERS NAME, ADDRESS AND PART NUMBER SHALL BE PLACED ON THE OUTSIDE SURFACE OF THE REAR PLATE. THIS INFORMATION SHALL NOT APPEAR ON THE FRONT PANEL.

SCALE: ZERO CENTER. SHALL BE MIRROR BACKED.

KNOBS SHALL BE PER MS91528, TYPE "F" OR TYPE "K" WHERE PRACTICAL. EXCEPT WHERE THE KNOB COLOR IS PART OF A COLOR CODE, ALL KNOBS SHALL BE FLAT BLACK.

GROUNDING: SIGNAL, REFERENCE, POWER SOURCE AND CHASSIS MUST BE ELECTRICALLY ISOLATED FROM EACH OTHER. THE CHASSIS AND THE LOW SIDE OF EACH LINE WILL BE GROUNDED TOGETHER EXTERNALLY.

INSTRUMENT SHALL BE DESIGNED TO MEET THE ENVIRONMENTAL REQUIREMENTS OF (ES-) ND

TWO COPIES OF SERVICE MANUALS CONTAINING A SPARE PARTS LIST, SCHEMATIC DIAGRAM, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND CALIBRATION PROCEDURES SHALL BE SUPPLIED WITH EACH UNIT. A COPY OF ALL INSPECTION TEST DATA SHALL BE SUPPLIED WITH EACH UNIT.

POWER: 115 VOLTS ± 10V, 60 ± 5 CPS, 60 VA MAX.

1▷ CONNECTOR PIN IDENTIFICATION (MS-3112E16-8P)

PIN	CONNECT TO
A	CHASSIS
B, C	OPEN
D	POWER HI
E	POWER LO
F, G, H	OPEN

2▷ 17 AND 19.000 INCH DIMENSIONS OF CHASSIS AND PANEL TO BE CENTRALIZED AT ASSEMBLY WITHIN .020 INCH. SIDES OF CHASSIS, LOCATED BY 17 INCH DIMENSION MUST BE PARALLEL WITHIN .031 AND PERPENDICULAR TO REAR SURFACE OF PANEL WITHIN .062.

3▷ THERE SHALL BE NO PROTRUSIONS OUTSIDE OF THE CHASSIS IN THIS AREA.

6▷ FINISH: APPLY FINISH P513 OF SPECIFICATION MIL-F-14072. PRIME AND FINISH COATS TO BE APPLIED TO FRONT AND EDGES OF PANEL. APPLY 2 COATS OF TT-E-529A CLASS B, ENAMEL, SEMI-GLOSS, LIGHT GRAY, COLOR 26440 OF FED. STD 595.
NOTE: MIL-P-8585 PRIMER SUPERCEDES MIL-P-6889.

7▷ CHARACTERS: FUTURA DEMIBOLD CHARACTER HEIGHT $\frac{1}{8}$, EXCEPT WHERE OTHERWISE SPECIFIED. SILK SCREEN PER ND 1002019 USING ENAMEL, SEMI-GLOSS INSTRUMENT BLACK, COLOR 514 OF ANA 157. CENTRALIZE AS SHOWN. MARKING OF REFERENCE DESIGNATION CHARACTERS OF DIMENSIONS SHOWN, TO BE APPLIED PER ND 1002019.

8▷ BORDER AREA WITHIN $\frac{9}{16}$ INCH OF THE PANEL EDGE, ON THE REAR SURFACE OF THE FRONT PANEL SHALL BE CO-PLANAR AND FREE OF PROTRUSIONS.

9▷ MOUNT NUT FROM THE INSIDE OF THE CHASSIS. ALLOW $\frac{3}{8}$ IN SCREW CLEARANCE AT EACH NUT FROM THE INSIDE SURFACE OF THE CHASSIS.

10▷ CONNECTOR PIN IDENTIFICATION (MS-3112E12-10PW)

PIN	CONNECT TO
A	OPEN
B	HI
C	LO
D	SHIELD GROUND
E, F, G H, J, K	OPEN

11▷ PHASE CALIBRATION: IT SHALL BE POSSIBLE TO CONNECT THE REFERENCE INPUT TO THE SIGNAL INPUT MOMENTARILY FOR CALIBRATION PURPOSES. THE CONTROL SHALL BE A FRONT PANEL SWITCH.

12▷ EXACT CONNECTOR LOCATION ON REAR OF ASSEMBLY IS TO BE DETERMINED BY THE SUPPLIER.

13▷ FRONT PANEL MATERIAL: $\frac{3}{16}$ ALUMINUM 5052H32. (QQ-A-318)

14▷ CONNECTOR PIN IDENTIFICATION (MS3112E12-10P)

PIN	CONNECT TO
A	OPEN
B	HI 800 CPS - #1
C	LO 800 CPS - #1
D	HI 3200 CPS
E	LO 3200 CPS
F	HI 800 CPS - #2
G	LO 800 CPS - #2
H	SHIELD GROUND
J, K	OPEN

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00994 DATE 24 Apr 63

15▷ THERE SHALL BE THREE SEPERATE REFERENCE VOLTAGE INPUTS (SEE NOTE 14▷ FOR CONNECTOR PINS); THEY ARE AS FOLLOWS:
1. 800 CPS REFERENCE #1
2. 800 CPS REFERENCE #2
3. 3200 CPS REFERENCE
THE THREE DISCRETE REFERENCE VOLTAGES SHALL ENTER THE INSTRUMENT AND TERMINATE ON A DECK OF THE "FREQUENCY" CONTROL SWITCH. SWITCHING OF THE FILTERS SHALL SIMULTANEOUSLY CONNECT THE PROPER REFERENCE TO THE REFERENCE ISOLATION TRANSFORMER PRIMARY. THE 800 CYCLE FILTER-SET SHALL BE USED FOR BOTH 800 CPS REFERENCE VOLTAGE INPUTS

DATA SOURCE:
GERTSCH PRODUCTS INC.
3211 SO. LA CIENGA BOULEVARD
LOS ANGELES 16, CALIFORNIA
PHASE ANGLE VOLTMETER PAV-2R

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN 5K 44299
DRAWN A. J. FLUDER DATE 22-JAN-63
CHECKED W. L. V. MOYLE 25 JAN 63
APPROVAL G. J. PESKURIC 9 APR 63
APPROVAL 9 APR 63
NASA APPROVAL 4/24/63
J P Helmuth 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

VOLTMETER - PHASE ANGLE

CODE IDENT NO. SIZE D 1900050
SCALE — SHEET 2 OF 2

MIL 1077D—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

PICTURE INCOMPLETE
REFER TO 1900024

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00999 **DATE** 24 Apr 63

						TO BE ASSIGNED	INDICATOR (MODEL 561)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900024		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — — — DECIMALS + — — — ANGLES + — — —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. MUNSON DATE 9 APR 63
CHECKED W. Diehl 10 APR 63
APPROVAL G. J. PESKURIC 10 Apr 63
APPROVAL 10 Apr 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR UNIT,
RM-561 (MODIFIED)

CODE IDENT NO.
SIZE C
1900051
SCALE —
SHEET

MIL 1078C—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1 PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010.

4 MARK WEIGHT OF ASSEMBLY PER ND-1002123 ADJACENT TO NAMEPLATE LOCATION.

CHASSIS SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN AT INSTALLATION.

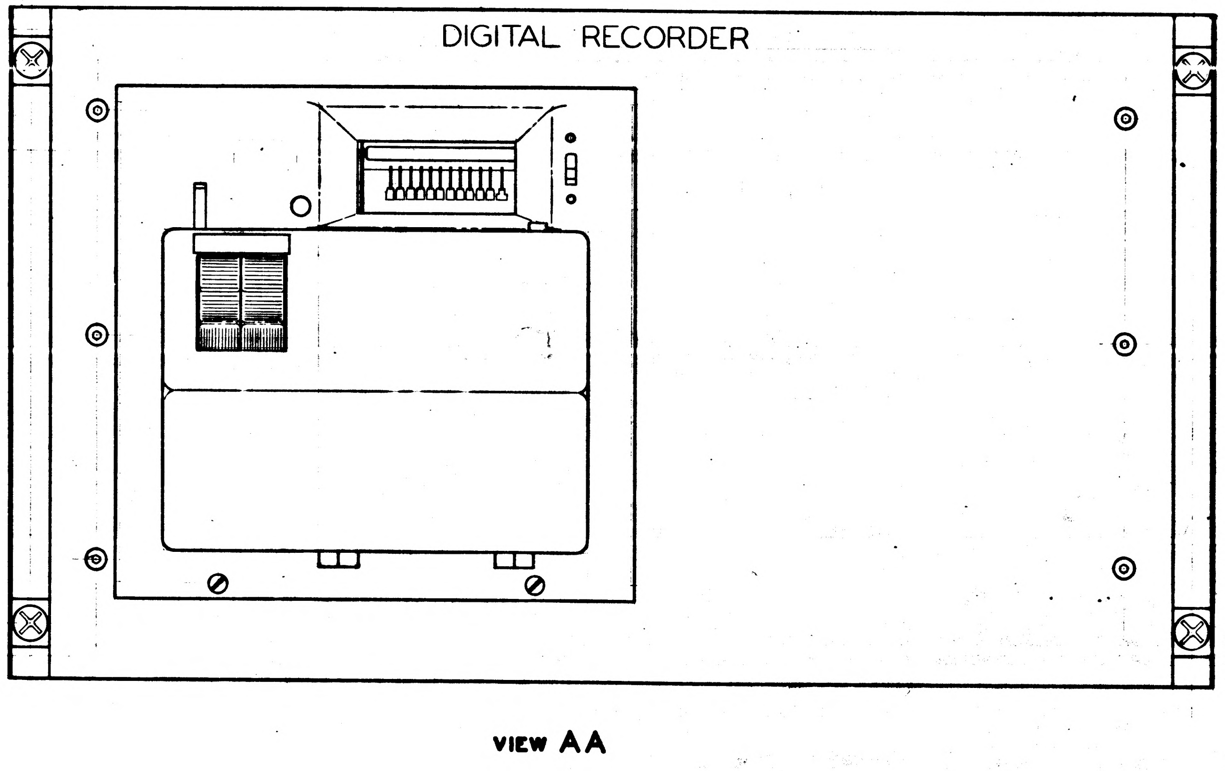
2 VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

SURFACE "Z" MUST BE FLUSH WITH SURFACE "Y" WITHIN .002.

MARK APPLICABLE CONTRACT NUMBER & SERIAL NO. TO ITEM 30 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .06 HIGH.

5 MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK.

6 SECURE SCREWS USING ITEM 49.



VIEW AA

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C		COMPLETELY REVISED AND REDRAWN PER MXC 186762		24 MAY 63	VTL
C1		CHANGED IN ACCORDANCE WITH MXC 187050		JUNE 63	C.J.R. LARS
D		CHANGED IN ACCORDANCE WITH MXC 187929 REVISION STATUS BLOCK ADDED	—	30 JUL 63	
E		ADDED ATP-1900052 TO P/L IN ACCORDANCE WITH MXC 188564 PER TDRR 03877	—	12 AUG 63 DEC 63	
F		CHANGE IN ACCORDANCE WITH MXC 190551		5 NOV 63	S.H.
G		ADDED ITEM 30,31 & ASSOC INFO PER MXC-190927	—	NOV-63	
H		CHANGE IN ACCORDANCE WITH CM-192731 REVISED PER TDRR 06966	—	DEC 63	
J		CHANGE IN ACCORDANCE WITH CM 92855 REVISED PER TDRR 06965	-	26 JAN 64	
K		CHANGE IN ACCORDANCE WITH CM-194144 REVISED PER TDR 06966		20 JAN 64	GV
L		CHANGE IN ACCORDANCE WITH CM 94581 REVISED PER TDRR 06967		30 JAN 64	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 APR 63
REPLACES REVISION B WITH CHANGE C

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			4		50	MS35333-73	WASHER, LOCK, INTERNAL TOOTH
			AR		49	MIL-S-40083-C150	SEALING COMPOUND ES-2544-5
			1		48	1900821	WIRE LIST AA
			X		47	1900241	WIRING DIAGRAM
			X		46	1900242	ELECTRICAL SCHEMATIC
			X		45	ATP-1900052	G&N SPECIFICATION
			1		44	1015791-010	SLIDE ASSY-QUICK RELEASE
			1		43	1015791-009	SLIDE ASSY-QUICK RELEASE
			4		31	AN535-00-4	SCREW, DRIVE, ROUND HEAD
			1		30	1901304-111	NAME PLATE, APOLLO, G&N
			1		29	1900094	WIRING HARNESS A
			1		28	MS35338-82	WASHER, LOCK
			1		27	AN960C416L	WASHER, FLAT
			6		26	AN363C1032	NUT
			3		25	AN363C832	NUT
			24		24	AN363C632	NUT
			1		23	MS35216-69	SCREW, MACHINE
			1		22	MS35216-66	SCREW, MACHINE
			4		21	MS35216-53	SCREW, MACHINE
			7		20	MS35216-42	SCREW, MACHINE
			44		19	MS35216-40	SCREW, MACHINE
			24		18	MS35216-27	SCREW, MACHINE
			6		17	1006783-45	SCREW, MACHINE
			10		16	1015826-304	SCREW, MACHINE
			8		15	1015831-253	SCREW, MACHINE
			1		14	MS21919DG6	(1897073-106) CLAMP, LOOP
			1		13	MS21919DG5	(1897073-105) CLAMP, LOOP
			2		12	MS21919DG10	(1897073-110) CLAMP, LOOP
			16		11	1015803-001	RELAY, REED, ASSY
			2		9	1900091	BAR, GUIDE
			1		8	1900086	BRACKET, ANGLE
			1		7	1900084	BRACKET, CONNECTOR
			1		6	1900087	PANEL, UPPER
			1		5	1900085	PANEL, FRONT
			1		4	1900063	PRINTER
			2		3	1900092	SUPPORT, HARNESS (INSEP. ASSY)
			2		2	1900015-061	HANDLE ASSY
			1		1	1900095	DRAWER, DIGITAL RECORDER (INSEP ASSY)

LIST OF PARTS AND MATERIALS

L	L
K	K
J	H
H	H
G	D
F	D
E	D
D	D
C1	C1
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J.A. DATE
CHECKED Ed Foster 17 MAY 63
APPROVAL A. Smith 17 MAY 63
APPROVAL 10/14/63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900052
SCALE 1/1
SHEET 1 OF 2

1900052

1900052

-W-

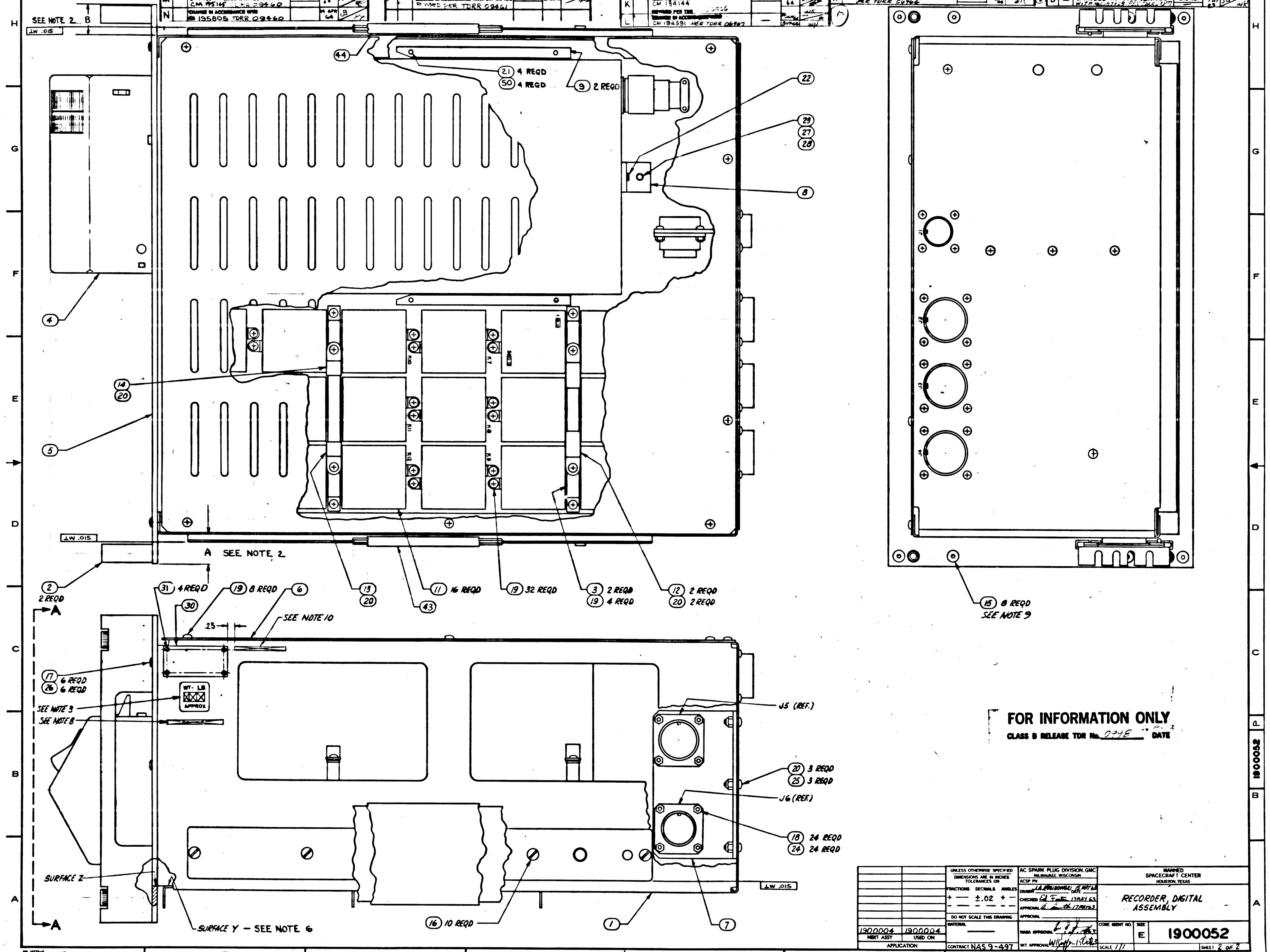
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
M		CHANGE IN ACCORDANCE WITH CM 195165 TDRR 09460		6 APR 64	
N		CHANGE IN ACCORDANCE WITH CM 195805 TDRR 09460		14 APR 64	B

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
P		CHANGE IN ACCORDANCE WITH CM 196400 REVISED PER TDRR 09461		21 APR 64	B

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
K		CHANGE IN ACCORDANCE WITH CM 194144 REVISED PER TDR 06966		20 JAN 64	GM WK
L		CHANGE IN ACCORDANCE WITH CM 194591 PER TDRR 06967	—	31 JAN 64	WK

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
H		CHANGE IN ACCORDANCE WITH ... PER TDRR 06964			WK

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D	—	CHANGED IN ACCORDANCE WITH ... PER TDRR ...	—	Sept 63	JGL WK



SEE NOTE 2 B
TW .015
44
21 4 REQD
50 4 REQD
9 2 REQD
22
29
27
28
8
4
14
20
5
K10
K7
K11
K8
K12
K9
J1
J2
J3
J4
TW .015
A SEE NOTE 2
2
2 REQD
13
20
43
11 16 REQD
19 32 REQD
3 2 REQD
19 4 REQD
12 2 REQD
20 2 REQD
15 8 REQD
SEE NOTE 9
A
31 4 REQD
30
19 8 REQD
6
.25
SEE NOTE 10
17 6 REQD
26 6 REQD
SEE NOTE 3
WT- LB APPROX
SEE NOTE 8
J5 (REF.)
20 3 REQD
25 3 REQD
J6 (REF.)
18 24 REQD
24 24 REQD
SURFACE Z
TW .015
SURFACE Y - SEE NOTE 6
16 10 REQD
1
7
A

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 0248 DATE

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	±.02	+ —

DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J.A. Kosidowski DATE 15 MAY 63
CHECKED Ed Foster 17 MAY 63
APPROVAL A. Smith 17 MAY 63
APPROVAL
NASA APPROVAL
MIT APPROVAL W. Coffin 15 Oct 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900052
SCALE 1/1
SHEET 2 OF 2

1900052

1900052

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2. DIMENSION "A" MUST BE EQUAL TO DIMENSION "B" WITHIN .040.

3. MARK WEIGHT OF ASSEMBLY, (77 LBS), PER ND1002123 ADJACENT TO NAMEPLATE LOCATION.

4. CHASSIS SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN AT INSTALLATION.

5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

6. SURFACE "Y" COVERS AN AREA EQUAL IN LENGTH TO FRONT PANEL OPENING AND A WIDTH OF 4 IN. FROM FRONT END OF CHASSIS PLATE. SURFACE "Y" MUST BE FLUSH TO .015 BELOW SURFACE "Z".

7. MARK APPLICABLE CONTRACT NUMBER & SERIAL NO. TO ITEM 30 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .06 HIGH.

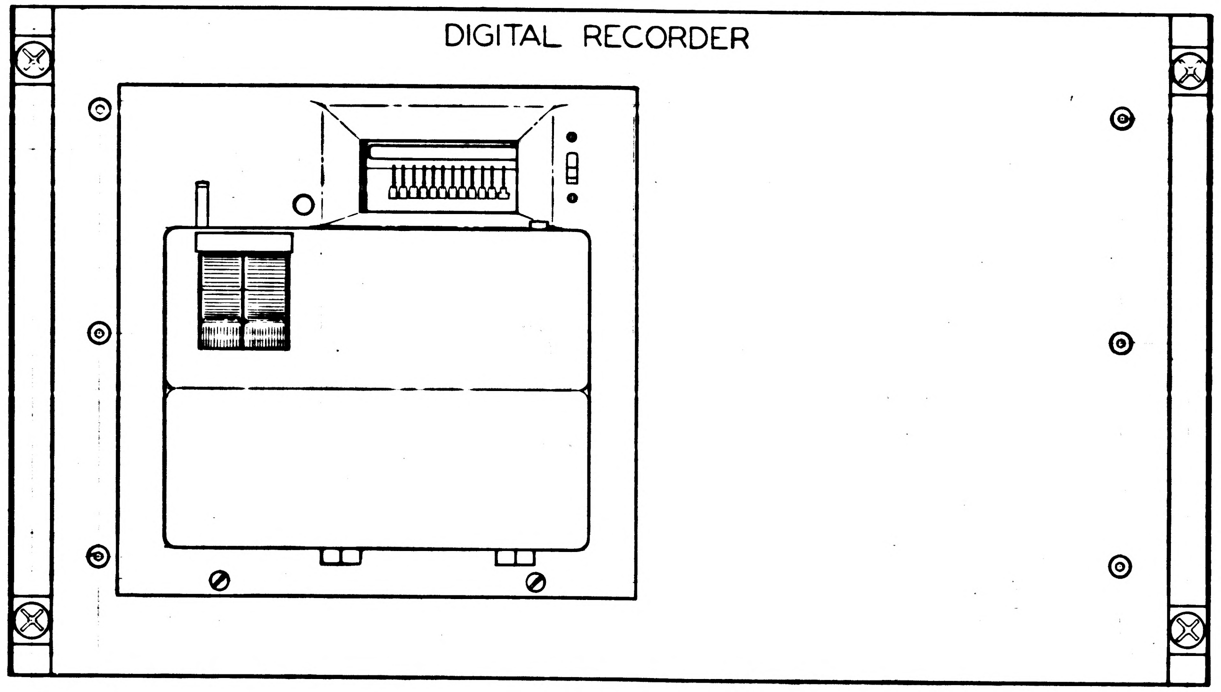
8. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK.

9. SECURE SCREWS USING ITEM 49.

10. MARK DRAWING DASH NO. & APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
C		COMPLETELY REVISED AND REDRAWN PER MXC 186762		24 MAY 63	VTL
C1		CHANGED IN ACCORDANCE WITH MXC 187050		11 JUNE 63	J.R. LARS
D		CHANGED IN ACCORDANCE WITH MXC 187929 REVISION STATUS BLOCK ADDED	—	30 JUL 63	
E		ADDED ATP-1900052 TO PL IN ACCORDANCE WITH MXC 188554 PER TDRR 3877	—	12 AUG 63	EL RC
F		CHANGE IN ACCORDANCE WITH MXC 190551		5 NOV 63	S.N. ETH
G		ADDED ITEM 30, 31 & ASSOC INFO, PER MXC-190927	—	11-NOV-63	JEL ETH
H		CHANGE IN ACCORDANCE WITH CM-192731 REVISED PER TDRR 06964	—		GM WR
J		CHANGE IN ACCORDANCE WITH CM 192655 REVISED PER TDRR 06965	—		WR
K		CHANGE IN ACCORDANCE WITH CM-194144 REVISED PER TDR 06966	—	20 JAN 64	GM WR
L		CHANGE IN ACCORDANCE WITH CM 194801 REVISED PER TDRR 06967	—		WR
M		CHANGE IN ACCORDANCE WITH CM 195166	—	2 APR 64	SA
N		CHANGE IN ACCORDANCE WITH CM 195805 TDRR 09460 REVISED CUSTOMER DATA (V2-64)	—	14 APRIL 64	JB PJ
P		REVISION STATUS CHANGED PER CM 196490 TDRR 09461	—	21 APR 64	JB PF
R		CHANGE IN ACCORDANCE WITH CM 196959 TDRR 09462		29 APR 64	PF



VIEW AA

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01998 DATE 24 APR 63

REPLACES REVISION 3 WITH CHANGE C

	ON	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	4		50	MS35333-73	WASHER, LOCK, INTERNAL TOOTH
	AR		49	MIL-S-40083-C130	SEALING COMPOUND ES-2544-5
	1		48	1900821	WIRE LIST AA
	X		47	1900241	WIRING DIAGRAM
	X		46	1900242	ELECTRICAL SCHEMATIC
	X		45	PS 1900052	PROCUREMENT SPECIFICATION
SEE NOTE 5	1		44	1015791-010	SLIDE ASSY - QUICK RELEASE
SEE NOTE 5	1		43	1015791-009	SLIDE ASSY - QUICK RELEASE
	4		31	AN535-00-4	SCREW, DRIVE, ROUND HEAD
	1		30	1901304-[illegible]	NAME PLATE APOLLO, G & N
	1		29	1900094	WIRING HARNESS A
	1		28	MS35338-82	WASHER, LOCK
	1		27	AN960C416L	WASHER, FLAT
	6		26	AN363C1032	NUT
	3		25	AN363C832	NUT
	24		24	AN363C632	NUT
	1		23	MS 35216-69	SCREW, MACHINE
	1		22	MS 35216-66	SCREW, MACHINE
	4		21	MS 35216-53	SCREW, MACHINE
	7		20	MS 35216-42	SCREW, MACHINE
	44		19	MS 35216-40	SCREW, MACHINE
	24		18	MS 35216-27	SCREW, MACHINE
SEE NOTE 5	6		17	1006783-45	SCREW, MACHINE
SEE NOTE 5	10		16	1015826-304	SCREW, MACHINE
SEE NOTE 5	8		15	1015831-253	SCREW, MACHINE
	1		14	MS21919DG6	(1897073-106) CLAMP, LOOP
	1		13	MS21919DG5	(1897073-105) CLAMP, LOOP
	2		12	MS21919DG10	(1897073-110) CLAMP, LOOP
SEE NOTE 5	16		11	1015803-001	RELAY, REED, ASSY
	2		9	1900091	BAR, GUIDE
	1		8	1900086	BRACKET, ANGLE
	1		7	1900084	BRACKET, CONNECTOR
	1		6	1900087	PANEL, UPPER
	1		5	1900085	PANEL FRONT
	1		4	1900063	PRINTER
	2		3	1900092	SUPPORT HARNESS (INSEP. ASSY)
	2		2	1900015-061	HANDLE ASSY
	1		1	1900095	DRAWER, DIGITAL RECORDER (INSEP ASSY)

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
R	P
P	P
N	N
M	M
L	L
K	K
J	H
H	H
G	D
F	D
E	D
D	D
C1	C1

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. A. Kosidowski DATE 15-MAY-63
CHECKED Ed Foster 17 MAY 63
APPROVAL A. Smith 17 MAY 63
APPROVAL Jelimann
NASA APPROVAL
MIT APPROVAL 15 JUL 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900052
SCALE 1/1
SHEET 1 OF 2

Charleston 17 MAY 63

1900052

B | 1900052

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADDED 1-MS3127E-16-8PW, 1-MS3127E-24-61P, 1-MS3127E-24-61PW, 1-MS3127E-24-61PX, 1-MS3127E-22-55S, 1-MS3126F-16-8S, 1-1015791-009, 1-1015791-010, 1-MS3127E-20-41S & 2-1900015-061	MXC 186172	1 MAY 63	JHR P.F.
B		REPLACED WITH CHANGE BY REVISION C PER TDRR 03877	MXC 186762	24 MAY 63	TL WR

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Apr 63

REPLACED WITH CHANGE BY REVISION C

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2			1900015-061	HANDLE ASSY.
			1			1015791-010	CHASSIS SLIDE ASSY., LEFT HAND
			1			1015791-009	CHASSIS SLIDE ASSY., RIGHT HAND
			1			MS3126F-16-8S	CONNECTOR, PLUG, ELECTRICAL
			1			MS3127E-20-41S	CONNECTOR, RECEPTACLE, ELEC.
			1			MS3127E-22-55S	↕
			1			MS3127E-24-61PX	↕
			1			MS3127E-24-61PW	↕
			1			MS3127E-24-61P	↕
			1			MS3127E-16-8PW	CONNECTOR, RECEPTACLE, ELEC.
			15			1015803-001	RELAY-REED, ASSY
			1			1900040	PRINTER ASSY

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN W Thiele DATE 9 APR 63
CHECKED 10 APR 63
APPROVAL Carpenter 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 4-24-63
J P Gilmore 4-24-63
MIT APPROVAL W Kupfer 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

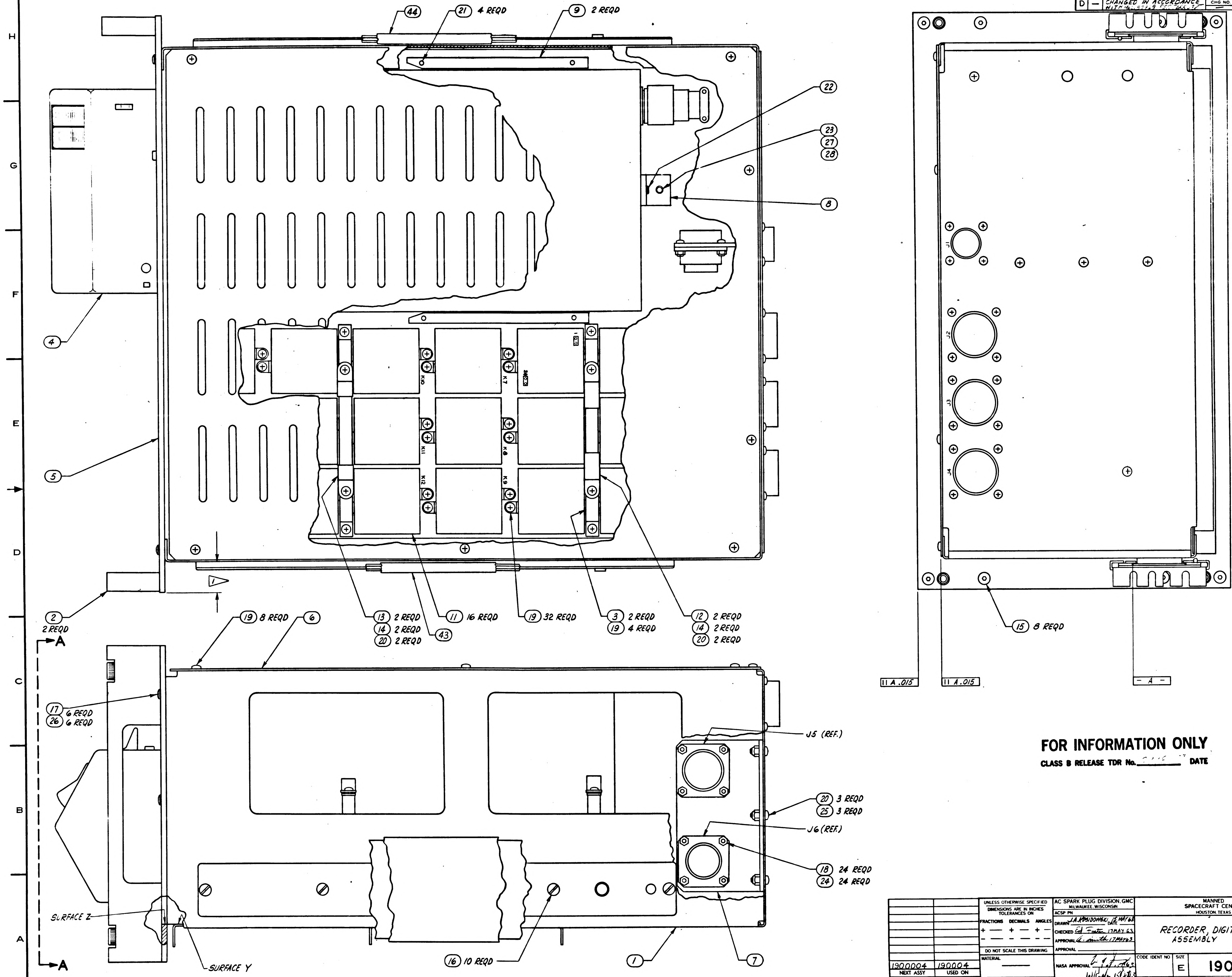
RECORDER, DIGITAL

CODE IDENT NO. SIZE D 1900052

SCALE SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D	—	CHANGED IN ACCORDANCE WITH [illegible]	—	[illegible]	[illegible]



44
21 4 REQD
9 2 REQD
22
23
27
28
8
4
5
2
2 REQD
K10
K7
K11
K8
K12
K9
13 2 REQD
14 2 REQD
20 2 REQD
43
11 16 REQD
19 32 REQD
3 2 REQD
19 4 REQD
12 2 REQD
14 2 REQD
20 2 REQD
J1
J2
J3
J4
15 8 REQD
11 A .015
11 A .015
– A –
A
A
19 8 REQD
6
17 6 REQD
26 6 REQD
J5 (REF.)
20 3 REQD
25 3 REQD
J6 (REF.)
18 24 REQD
24 24 REQD
SURFACE Z
SURFACE Y
16 10 REQD
1
7

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ______ **DATE**

1900004	190004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE. WISCONSIN
ACSP PN
DRAWN J.A. KOSIDOWSKI DATE 15 MAY 63
CHECKED Ed Foster 17 MAY 63
APPROVAL A. Smith 17 MAY 63
APPROVAL
NASA APPROVAL [illegible] 63
MIT APPROVAL W [illegible] 15 Oct 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL
ASSEMBLY

CODE IDENT NO
SIZE E
1900052
SCALE 1/1
SHEET 2 OF 2

E 1900052

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1900052

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
C		COMPLETELY REVISED AND REDRAWN PER MXC 186762		26 MAY 63	
C1		CHANGED IN ACCORDANCE WITH MXC 187050		JUNE 63	
D		CHANGED IN ACCORDANCE WITH MXC 187929 REVISION STATUS BLOCK ADDED	—	30 JUL 63	
E		ADDED ATP-1900052 TO P/L IN ACCORDANCE WITH MXC 188564 PER TDRR 23877	—	12/6/63	

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

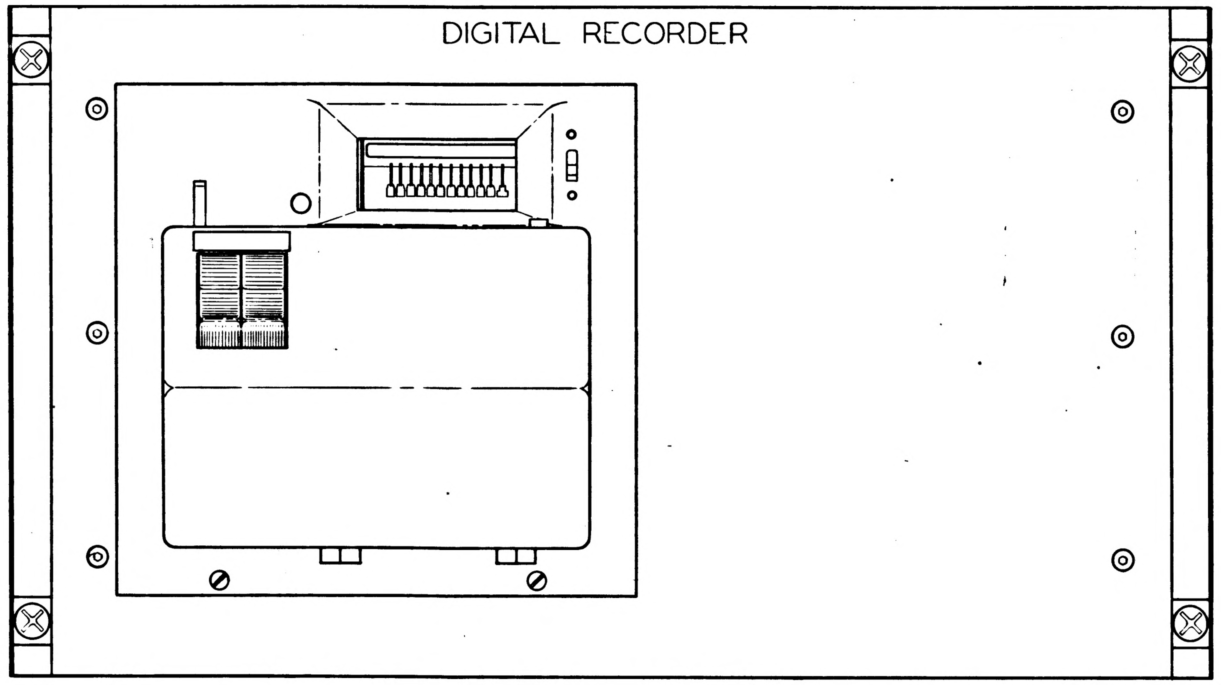
1 PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010.

MARK WEIGHT OF ASSEMBLY PER ND- ADJACENT TO NAMEPLATE LOCATION.

CHASSIS SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN AT INSTALLATION.

2 VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

SURFACE "Z" MUST BE FLUSH WITH SURFACE "Y" WITHIN .002.



VIEW AA

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 APR 63
REPLACES REVISION B WITH CHANGE C

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				X		45	ATP-1900052	G&N SPECIFICATION
				1		44	1015791-010	SLIDE ASSY-QUICK RELEASE
				1		43	1015791-009	SLIDE ASSY-QUICK RELEASE
				567		42	1015949-002	TERM.-TAP. PIN, CRIMP ST., INSULAT.
				1		41	MS3127E-16-8PW	CONNECTOR, RECEPTACLE, ELEC.
				1		40	MS3127E-24-61P	CONNECTOR, RECEPTACLE, ELEC.
				1		39	MS3127E-24-61PW	CONNECTOR, RECEPTACLE, ELEC.
				1		38	MS3127E-24-61PX	CONNECTOR, EECEPTACLE, ELEC.
				1		37	MS3127E-22-55S	CONNECTOR, RECEPTACLE, ELEC.
				1		36	MS3127E-20-41S	CONNECTOR, RECEPTACLE, ELEC.
				1		35	MS3126F-16-8S	CONNECTOR, PLUG ELECTRICAL
2								
2								
2								
2								
				1		30		NAME PLATE
				1		29		WIRING HARNESS
				1		28	MS35338-82	WASHER, LOCK
				1		27	AN960C416L	WASHER, FLAT
				6		26	AN363C1032	NUT
				3		25	AN363C832	NUT
				24		24	AN363C632	NUT
				1		23	MS35216-69	SCREW, MACHINE
				1		22	MS35216-66	SCREW, MACHINE
				4		21	MS35216-53	SCREW, MACHINE
				7		20	MS35216-42	SCREW, MACHINE
				44		19	MS35216-39	SCREW, MACHINE
				24		18	MS35216-27	SCREW, MACHINE
2				6		17	1006783-45	SCREW, MACHINE
				10		16	1015826-296	SCREW, MACHINE
2				8		15	1015831-257	SCREW, MACHINE
				4		14		WASHER, SADDLE
				2		13		CLAMP, LOOP
				2		12		CLAMP, LOOP
2				16		11	1015803-001	RELAY, REED ASSY
2								
				2		9	1900091	BAR, GUIDE
				1		8	1900086	BRACKET, ANGLE
				1		7	1900084	BRACKET, CONNECTOR
				1		6	1900087	PANEL, UPPER
				1		5	1900085	PANEL, FRONT
				1		4	1900063	PRINTER
				2		3	1900092	SUPPORT, HARNESS (INSEP. ASSY)
				2		2	1900015-061	HANDLE ASSY
				1		1	1900095	DRAWER, DIGITAL RECORDER (INSEP ASSY)
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

E	D
C1	C1
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

1900004 NEXT ASSY	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
1900004 USED ON	DO NOT SCALE THIS DRAWING	ACSP PN	RECORDER DIGITAL ASSEMBLY	
APPLICATION	MATERIAL —	DRAWN J.A. KOSIDOWSKI DATE 15-MAY-63 CHECKED Ed Foster 17 MAY 63 APPROVAL A. Smith 17 MAY 63 APPROVAL [illegible] 10/14/63	CODE IDENT NO.	SIZE E
	CONTRACT NAS 9-497	NASA APPROVAL MIT APPROVAL	SCALE 1/1	1900052 SHEET [illegible]

Charleston 17-MAY-63.

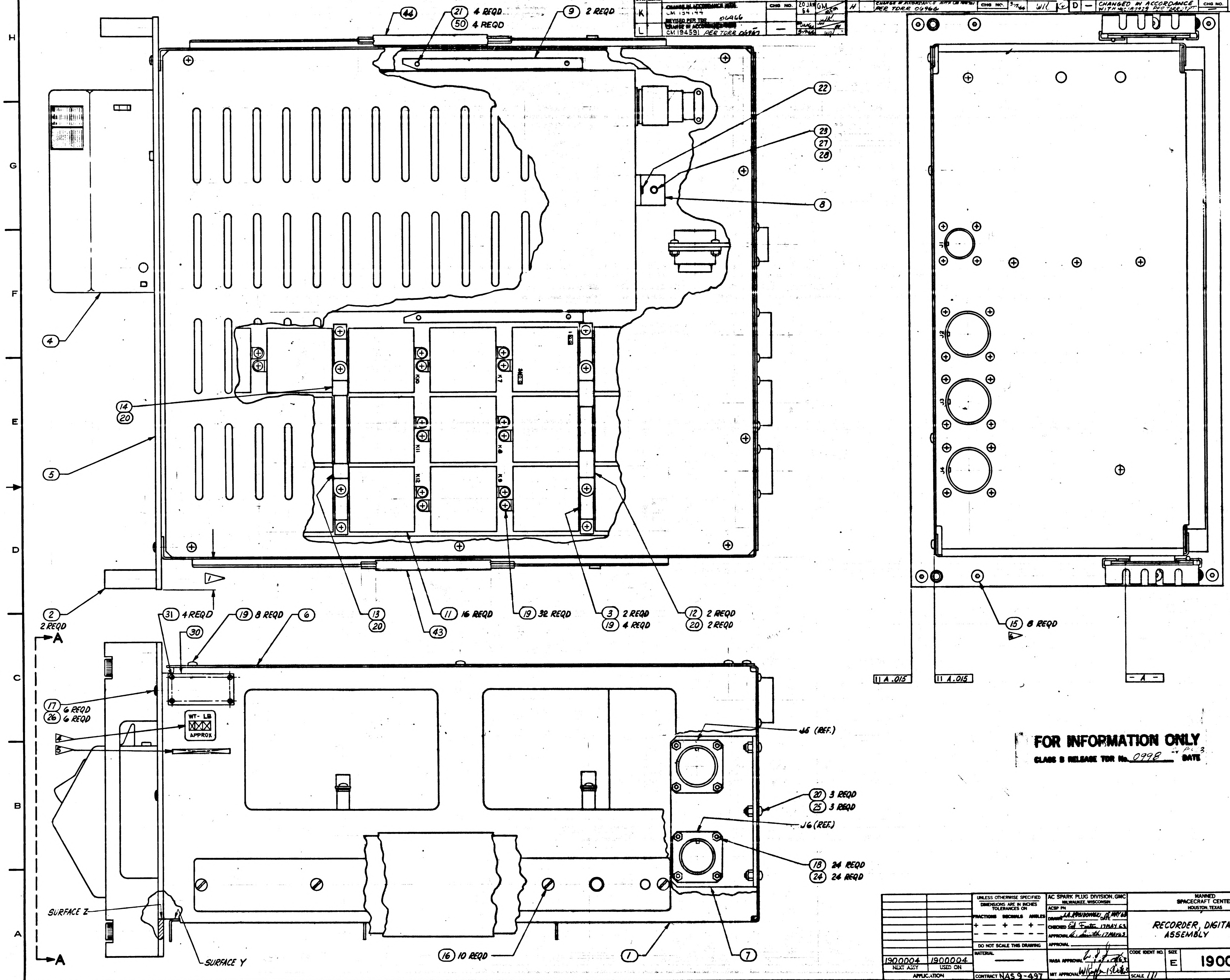
INCHES
PHOTOGRAPHIC SCALE ONLY

1900052 E

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
K		~~CHANGE IN ACCORDANCE~~ CM 194144		20 JAN 64	GM
L		~~REVISED PER TDR~~ 06466 ~~CHANGE IN ACCORDANCE~~ CM 194591 PER TDRR 06987	—	JAN 64	WK

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
H	–	CHANGE IN ACCORDANCE WITH CM 194591 PER TDRR 06964		3-17-64	WK

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D	—	CHANGED IN ACCORDANCE WITH MC197929 PER TDRR	—	5-21-63	JGL WK


44
21 4 REQD
50 4 REQD
9 2 REQD
22
23
27
28
8
4
14
20
5
2
2 REQD
1
K10
K7
K11
K8
K12
K9
13
20
43
11 16 REQD
19 32 REQD
3 2 REQD
19 4 REQD
12 2 REQD
20 2 REQD
15 8 REQD
J1
J2
J3
J4
11 A .015
11 A .015
– A –
A
A
31 4 REQD
30
19 8 REQD
6
17 6 REQD
26 6 REQD
WT- LB
APPROX
J5 (REF.)
20 3 REQD
25 3 REQD
J6 (REF.)
18 24 REQD
24 24 REQD
SURFACE Z
SURFACE Y
16 10 REQD
7

FOR INFORMATION ONLY

CLASS II RELEASE TDR No. 0998 DATE

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J.A. Kobidowski 15 MAY 63 DATE
CHECKED Ed Foster 17 MAY 63
APPROVAL G. Smith 17 MAY 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL
ASSEMBLY

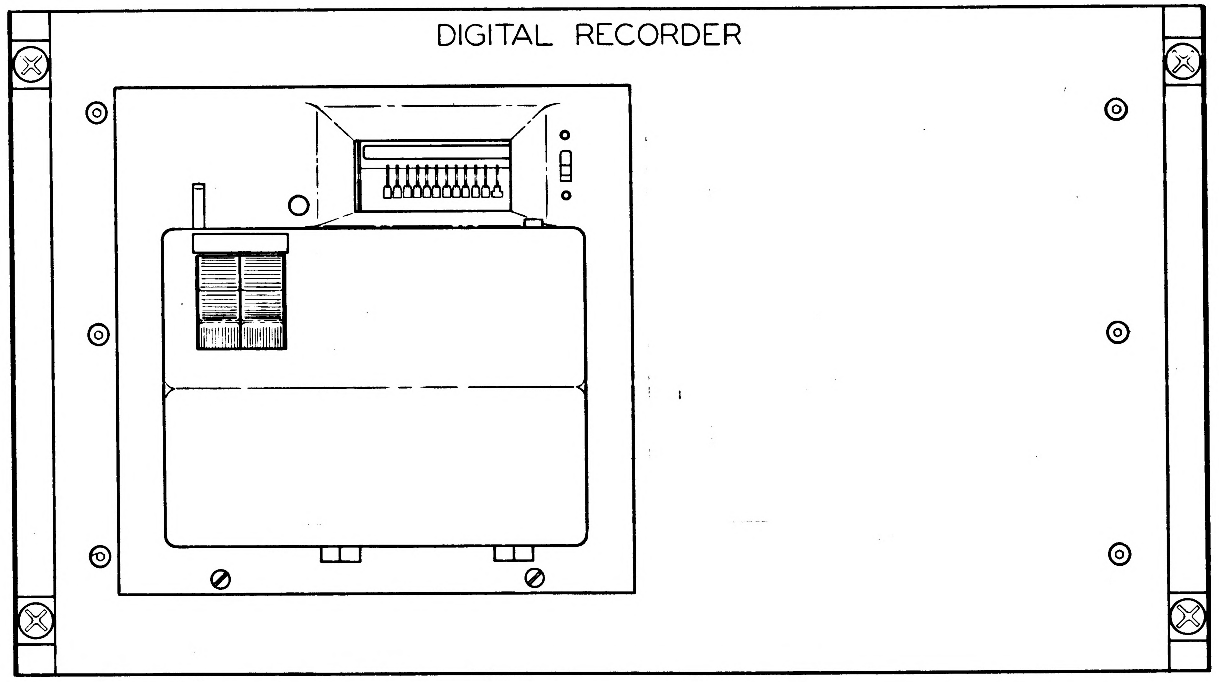
CODE IDENT NO. SIZE E 1900052
SCALE 1/1 SHEET 2 OF 2

1900052

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. DIMENSION "A" MUST BE EQUAL TO DIMENSION "B" WITHIN .040.
3. MARK WEIGHT OF ASSEMBLY, (77 LBS), PER ND1002123 ADJACENT TO NAMEPLATE LOCATION.
4. CHASSIS SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN AT INSTALLATION.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
6. SURFACE "Y" COVERS AN AREA EQUAL IN LENGTH TO FRONT PANEL OPENING AND A WIDTH OF 4 IN. FROM FRONT END OF CHASSIS PLATE. SURFACE "Y" MUST BE FLUSH TO .015 BELOW SURFACE "Z".
7. MARK APPLICABLE CONTRACT NUMBER & SERIAL NO. TO ITEM 30 IN ACCORDANCE WITH ND-1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
8. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK.
9. SECURE SCREWS USING ITEM 49.
10. MARK DRAWING DASH NO. & APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.



VIEW AA

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
C		COMPLETELY REVISED AND REDRAWN PER MXC 186762		24 MAY 63	
C1		CHANGED IN ACCORDANCE WITH MXC 187050		11 JUNE 63	
D		CHANGED IN ACCORDANCE WITH MXC 187929 REVISION STATUS BLOCK ADDED	—	30 JUL 63	
E		ADDED ATP-1900052 TO P/L IN ACCORDANCE WITH MXC 188564 PER TDRR 03877	—	12 AUG 63	RP
F		CHANGE IN ACCORDANCE WITH MXC 190551		5 NOV 63	S.H.
G		ADDED ITEM 30, 31 & ASSOC INFO, PER MXC-190927	—	11-NOV-63	
H		CHANGE IN ACCORDANCE WITH CM-192731 REVISED PER TDRR 06964	—	DEC 63	GM
J		CHANGE IN ACCORDANCE WITH CM 192655 REVISED PER TDRR 06965	—		
K		CHANGE IN ACCORDANCE WITH CM-194144 REVISED PER TDR 06966	—	20 JAN 64	GM
L		CHANGE IN ACCORDANCE WITH CM 194591 REVISED PER TDRR 06967	—	30 JAN	
M		CHANGE IN ACCORDANCE WITH CM195165	—	2 APR 64	SA
N		CHANGE IN ACCORDANCE WITH CM 195805 TDRR 09460 REVISED CUSTOMER DATA (V2-64)	—	14 APRIL 64	PF
P		REVISION STATUS CHANGED PER CM 196490 TDRR 09461	—	21 APR 64	B PF
R		CHANGE IN ACCORDANCE WITH CM 196959 TDRR 09462		29 APR 64	PF
S		REPLACED WITH CHANGE BY REV. T PER TDRR 10873		21 JUL 64	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 APR 63
REPLACES REVISION B WITH CHANGE C
⑤ REPLACED WITH CHANGE BY REV "T"

		QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
					4		50	MS35333-73	WASHER, LOCK, INTERNAL TOOTH
					AR		49	MIL-S-40083-C130	SEALING COMPOUND ES-2544-5
					1		48	1900821	WIRE LIST AA
					X		47	1900241	WIRING DIAGRAM
					X		46	1900242	ELECTRICAL SCHEMATIC
					X		45	PS-1900052	PROCUREMENT SPECIFICATION
SEE NOTE 5					1		44	1015791-010	SLIDE ASSY-QUICK RELEASE
SEE NOTE 5					1		43	1015791-009	SLIDE ASSY-QUICK RELEASE
					4		31	AN535-00-4	SCREW, DRIVE, ROUND HEAD
					1		30	1901304-111	NAME PLATE, APOLLO, G&N
					1		29	1900094	WIRING HARNESS A
					1		28	MS35338-82	WASHER, LOCK
					1		27	AN960C416L	WASHER, FLAT
					6		26	AN363C1032	NUT
					3		25	AN363C832	NUT
					24		24	AN363C632	NUT
					1		23	MS35216-69	SCREW, MACHINE
					1		22	MS35216-66	SCREW, MACHINE
					4		21	MS35216-53	SCREW, MACHINE
					7		20	MS35216-42	SCREW, MACHINE
					44		19	MS35216-40	SCREW, MACHINE
					24		18	MS35216-27	SCREW, MACHINE
SEE NOTE 5					6		17	1006783-45	SCREW, MACHINE
SEE NOTE 5					10		16	1015826-304	SCREW, MACHINE
SEE NOTE 5					8		15	1015831-253	SCREW, MACHINE
					1		14	MS21919DG6	(1897073-106) CLAMP, LOOP
					1		13	MS21919DG5	(1897073-105) CLAMP, LOOP
					2		12	MS21919DG10	(1897073-110) CLAMP, LOOP
SEE NOTE 5					16		11	1015803-001	RELAY, REED, ASSY
					2		9	1900091	BAR, GUIDE
					1		8	1900086	BRACKET, ANGLE
					1		7	1900084	BRACKET, CONNECTOR
					1		6	1900087	PANEL, UPPER
					1		5	1900085	PANEL, FRONT
					1		4	1900063	PRINTER
					2		3	1900092	SUPPORT, HARNESS (INSEP. ASSY)
					2		2	1900015-061	HANDLE ASSY
					1		1	1900095	DRAWER, DIGITAL RECORDER (INSEP ASSY)

LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
S	S
R	P
P	P
N	N
M	M
L	L
K	K
J	H
H	H
G	D
F	D
E	D
D	D
C1	C1

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J. A. KOSIDOWSKI DATE 15-MAY-63
CHECKED Ed Foster 17 MAY 63
APPROVAL A. Smith 17 MAY 63
APPROVAL Jackman 9/4/63
NASA APPROVAL
MIT APPROVAL 15 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL ASSEMBLY

CODE IDENT NO.
SIZE E
1900052
SCALE 1/1
SHEET 1 OF 2

Charlton 17-MAY-63.

1900052

-W-

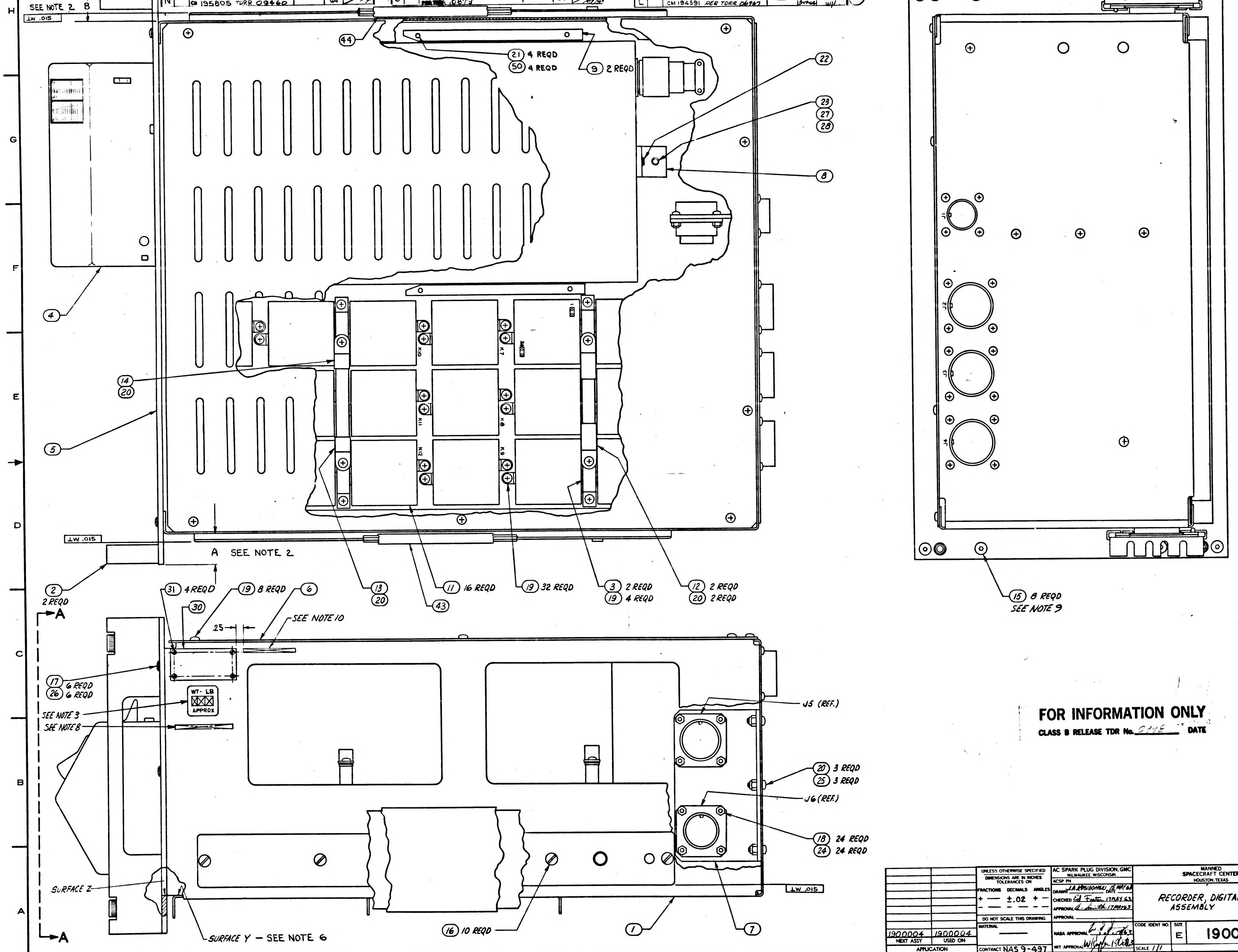
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
M		CHANGE IN ACCORDANCE WITH CM 195165 TDRR 09460		8 APR 64	JA
N		CHANGE IN ACCORDANCE WITH CM 195805 TDRR 09460		14 APR 64	B

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
P		~~CHANGE IN ACCORDANCE WITH CM 196430~~ REVISED PER TDRR 09461		21 APR 64	B
S		REPLACED WITH CHANGE BY REV. T ~~PER TDR~~ 10873		21 JUL 64	WF

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
K		CHANGE IN ACCORDANCE WITH CM 194144 REVISED PER TDR 06966		20 JAN 64	GM mem WK
L		CHANGE IN ACCORDANCE WITH CM 194591 PER TDRR 06967	—	JAN 64 3-17-64	WK

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
H		CHANGE IN ACCORDANCE WITH CM 194791 PER TDRR 06964		3-7-64	WK

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
D	—	CHANGED IN ACCORDANCE WITH [illegible]	—	Sep 63	JGL WK


SEE NOTE 2 B
.015 WT
44
21 4 REQD
50 4 REQD
9 2 REQD
22
23
27
28
8
4
14
20
5
K10
K7
K11
K8
K12
K9
.015 WT
A SEE NOTE 2
2
2 REQD
13
20
43
11 16 REQD
19 32 REQD
3 2 REQD
19 4 REQD
12 2 REQD
20 2 REQD
J1
J2
J3
J4
15 8 REQD
SEE NOTE 9
A
31 4 REQD
30
19 8 REQD
6
25
SEE NOTE 10
17 6 REQD
26 6 REQD
SEE NOTE 3
WT - LB
APPROX
SEE NOTE 8
J5 (REF.)
20 3 REQD
25 3 REQD
J6 (REF.)
18 24 REQD
24 24 REQD
SURFACE Z
A
SURFACE Y — SEE NOTE 6
16 10 REQD
1
7
.015 WT

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0778 **DATE**

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS ±.02 ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN J.A. KOSIDOWSKI DATE 15 MAY 63
CHECKED Ed Foster 17 MAY 63
APPROVAL A. Smith 17 MAY 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900052
SCALE 1/1
SHEET 2 OF 2

1900052

1900052

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Apr 63

			15			1015803-001	RELAY-REED, ASSY
			1			1900040	PRINTER ASSY
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W Thiele DATE 9 APR 63
CHECKED 10 APR 63
APPROVAL Carpenter 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
4 24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER, DIGITAL

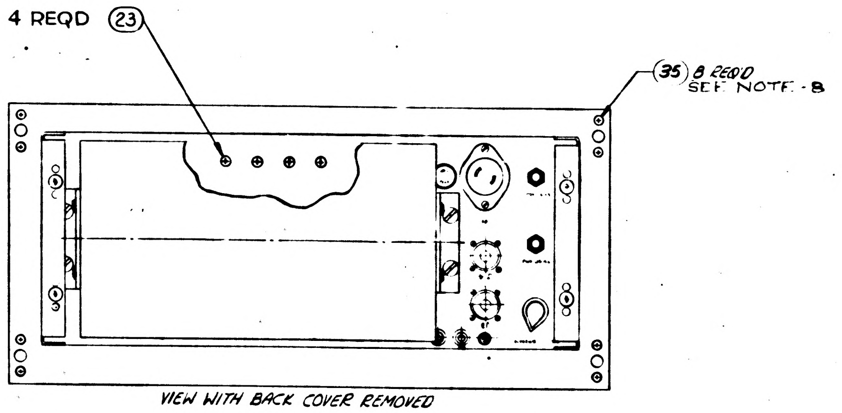
CODE IDENT NO.
SIZE D
1900052
SCALE
SHEET

MIL 10780—P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. SOLDER PER MIL-STD-440 USING ITEMS ㉜ AND ㉝.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK E REFERENCE DESIGNATIONS AS SHOWN ON ITEMS 42, 43 AND 44. CHARACTERS TO BE .12 HIGH, COLOR BLACK, PER ND1002019. THESE ITEMS MUST BE SOLDERED TO HARNESS BEFORE CONNECTING TO ITEM 25.
6.
7. MARK WEIGHT OF ASSEMBLY PER ND1002123 ADJACENT TO NAMEPLATE.
8. SECURE SCREWS USING ITEM 47
9. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 40 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .020.

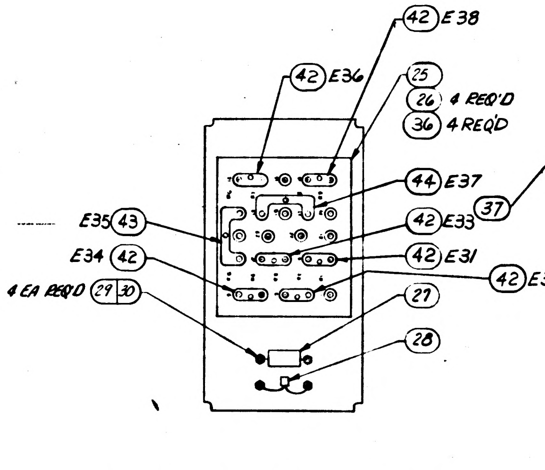


VIEW WITH BACK COVER REMOVED

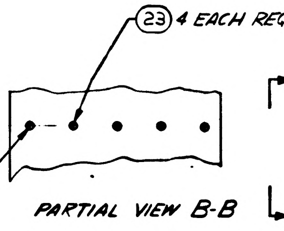
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		(1) REPLACES REV A WITH CHANGE. (2) COMPLETELY REVISED & REDRAWN PER MXC 186595	TDR'R 01473	21 MAY 63 6/4/63	PTW
B1	B-5 C-2	(1) REMOVED (4) 1896961-002 (ITEM ⑪) & (2) 1896961-001 (ITEM ⑫). (2) ITEM ⑱: 1015915-001 WAS 1015915.	MXC 186964	19 JUN 63	RM
B2	C-4 D-5	(1) ITEM ⑩: REMOVED (2) 1900015-041 & ADDED (2) 1900015-051. (2) ITEM ㉑: REMOVED (1) 1015808 & ADDED (1) 1015945.	MXC 187072		
B3	H-8	(1) REVISED PER MXC-187186	MXC 187186		
C	C-2	ITEM 27 P/N 1015816-005 WAS P/N 1015814-005	MXC 187576		GL
D		REVISED IN ACCORDANCE WITH MXC 188339	MXC 188339	25 JUL 63	C.A.M.
		[illegible]		[illegible]	
E	C-2 H-5 B-5	CHANGED IN ACCORDANCE WITH MXC 189388	—	18 SEP 63	PTW J.E.G.
F	C2 C4 C5	CHANGED IN ACCORDANCE WITH MXC 189597	—	19 SEP 63	PTW J.E.G.
—	—	ADDED CUSTOMERS DATA (V7-63)	—	9 SEP 63	PTW J.E.G.
G	-	CHANGE IN ACCORDANCE WITH MXC-190552	-	16 OCT 63	M.G.
H	-	CHANGE IN ACCORDANCE WITH MXC 190927 07441	—	16 OCT 63	
J	-	CHANGE IN ACCORDANCE WITH MXC 192011 07442	-	26 DEC 63	T.P.
K	—	CHANGE IN ACCORDANCE WITH MXC 192073	-	10 JAN 63	T.P.
L	—	CHANGE IN ACCORDANCE WITH MXC 192487 07443	-	10 JAN 63	T.R.
M		CHANGE IN ACCORDANCE WITH MXC 194145 07444	-	24 JAN 64	L.G.H.
N		CHANGE IN ACCORDANCE WITH CM 194558 REVISED PER TDR 07445		31 JAN 64	

FOR INFORMATION ONLY

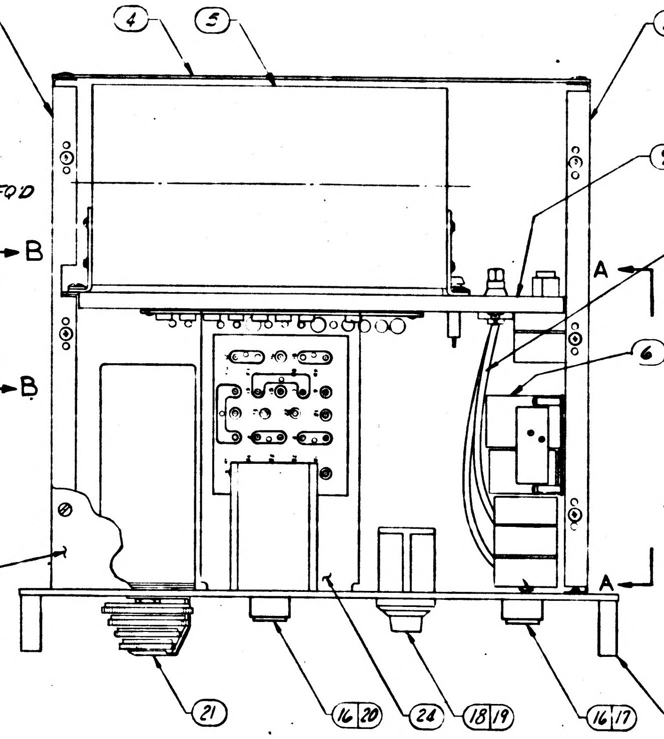
CLASS B RELEASE TDR No. 01473 DATE 5 June 1963

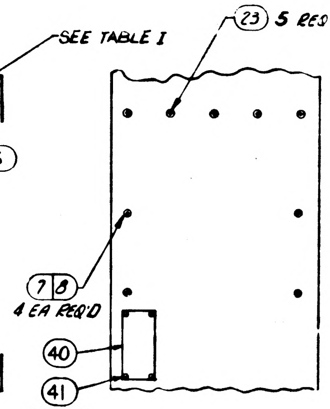


BOTTOM PANEL REMOVED FROM DRAWER



PARTIAL VIEW B-B





PARTIAL VIEW A-A

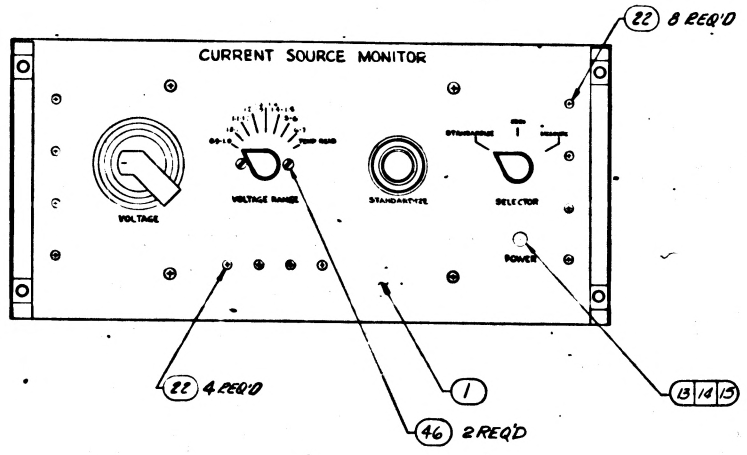


TABLE I

CABLE		CIRCUIT POINT	STRIP	TIN
J3	CENTER	S2C	3/8	YES
	PIGTAIL	S2b	3/8	YES
J4	CENTER	S2a	3/8	YES
	PIGTAIL	S2b	3/8	YES

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				AR		47	MIL-[illegible]-40083-C130	(ES-2544-5) SEALING COMPOUND
				2		46	AN507-832-6(1896998-064)	SCREW, FLAT HEAD
				X		45	ATP 1900053	ASSEMBLY & TEST PROCEDURE
				1		44	1900180	JUMPER STRAP
				1		43	1900179	JUMPER STRAP
				6		42	1900178	JUMPER STRAP
				4		41	AN535-00-4(1897109-004)	SCREW, DRIVE, ROUND HEAD
				1		40	1901304 133	NAMEPLATE
				1		39	1900276	WIRE LIST CC
				1		38	1900275	WIRE HARNESS A
				1		37	MS35216-39	SCREW PAN HD CROSS RECESSED
				4		36	MS35333-74	WASHER LOCK
				8		35	1015831 253	SCREW FLAT HD
				X		34	1900083	SCHEMATIC, ELECTRICAL
				AR		33	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				AR		32	QQ-S-571 MIL-F-14256	FLUX TYPE AR (ES-2175 TYPE 1 OR 2) FLUX (ES-2798)
				4		30	MS35216-11	SCREW-PAN HD CROSS RECESSED
				4		29	SE190D01(1896962-002)	TERMINAL-INSULATED MIL-T-55155
SEE NOTE 4				1		28	1015810-001	RESISTOR-FIXED
SEE NOTE 4				1		27	1015816-005	RESISTOR-FIXED
				4		26	AN335-4(1896987-040)	NUT-HEX
SEE NOTE 4				1		25	1015807	RESISTOR-NETWORK
				1		24	1900115	PANEL-BOTTOM (INSEP ASSY)
				13		23	MS35216-40	SCREW-PAN HD CROSS RECESSED
				12		22	AN507-832-8(1896998-084)	SCREW-FLAT HEAD
SEE NOTE 4				1		21	1015945-003	RESISTOR-VARIABLE
SEE NOTE 4				1		20	1015859-001	SWITCH-ROTARY
				1		19	1015809-001	RESISTOR-VARIABLE
SEE NOTE 4				1		18	1015915-001	DIAL CONTROL
SEE NOTE 4				1		17	1015858-003	SWITCH-ROTARY
				2		16	2K2B(1897080-023)	KNOB-CONTROL, ROUND, MS 91528
				1		15	NE20(1897066-001)	LAMP-GLOW, MS 25252
				1		14	LH74(1896963-002)	LIGHT-INDICATOR, LENS, MIL-L-3661
				1		13	LC13WT(1896963-001)	LIGHT-INDICATOR, HOUSING, MIL-L-3661
				2		10	1900015-051	HANDLE ASSEMBLY
				1		9	1900122-011	CENTER PANEL ASSEMBLY
				4		8	MS35216-47	SCREW-PAN HD, CROSS RECESSED
				4		7	1015860-009	SPACER (FIBER-CYLINDRICAL)
				1		6	1900112-011	SUB-CHASSIS, VOLTAGE REGULATOR
				1		5	1900114-011	STANDARD CELL & THERMO-CNTR ASSY
				1		4	1900101	COVER-BACK (INSEP ASSY)
				2		3	1900102	COVER-TOP & BOTTOM (INSEP ASSY)
				2		2	1900113	BRACKET-END (INSEP ASSY)
				1		1	1900103	PANEL-FRONT (INSEP ASSY)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900145-011	1900145-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — DECIMALS + — ANGLES + —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 9-APR-63
CHECKED MALIKOWSKI 10-APR-63
APPROVAL R.G. KELLY
APPROVAL A.J. KODEL 10-APR-63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

CODE IDENT NO.
SIZE E
1900053
SCALE 1:2
SHEET

Ⓑ REPLACES REV A WITH CHANGE

1900053 N

1900053 A

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		(1)REPLACED WITH CHANGE BY REV B PER MKC 180595 TDRR 0473	TDRR 473	21 MAY 63 8/8/63	PTW EF

(M)

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Apr 63

(A1) REPLACED WITH CHANGE BY REV B

			1			1015811 -001	↑ 1K .2% 5000PPM/°C ±10%
			2			↑ -002	10K .1% 15 PPM/°C
			1			1015810 -001	1K .1% 15 PPM/°C
			1			↑ -003	146.8K .02%
			1			-002	200K
			1			1015815 -001	225K .05%
			1			↑ -002	1MEG .05%
			1			1015814-001	450K .25%
			1			↑ -005	100K .01%
			1			-004	80.2K .02%
			1			-003	18.8K
			2			-002	90K .25%
			4			1015816-001	RESISTOR 50K .25%
			6			1015801-001	CELL, STD UNSATURATED TYPE MINI
			1			↑ -012	↑ ↑ ↑
			1			-011	
			1			-010	
			1			-009	
			4			1015812-008	RESISTOR-VARIABLE TRIMPOT
			2			1015809-002	RESISTOR-VARIABLE HELIPOT
			1			1010373-024	RESISTOR, VARIABLE TRIMPOT
			1			1010373-019	RESISTOR, VARIABLE TRIMPOT
			6			1010259	DIODE, SEMICOND. ZENER 1N825
			4			1010258	DIODE, SEMICOND. ZENER 1N763
			4			1010385	DIODE, SEMICONDUCTOR
			1			1015806	TRANSFORMER, POWER
			1			1015807	RESISTOR RATIO SET SRS 109
			1			1015808	DEKAPOT TYPE DP 311
			1			1015809-001	HELIPOT 20K 1%
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
+ + +
− − −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiele DATE 9 APR 63
Milwaukee 10 APR 63
CHECKED
APPROVAL RG Kelly
APPROVAL 10 APR 63
NASA APPROVAL 4/20/63
J P Gilmore 4-22-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

CODE IDENT NO.
SIZE D
1900053
SCALE
SHEET

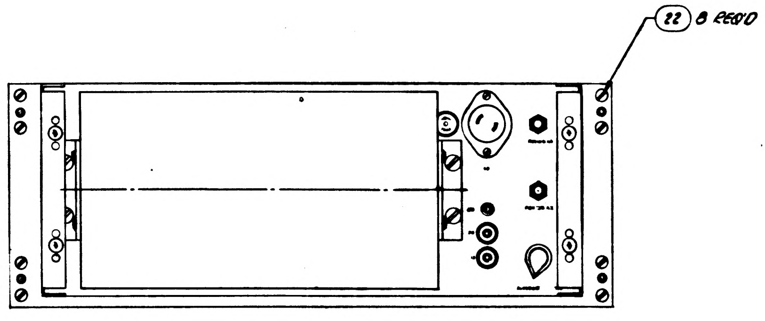
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS
PRESCRIBED BY MIL-D-70327.

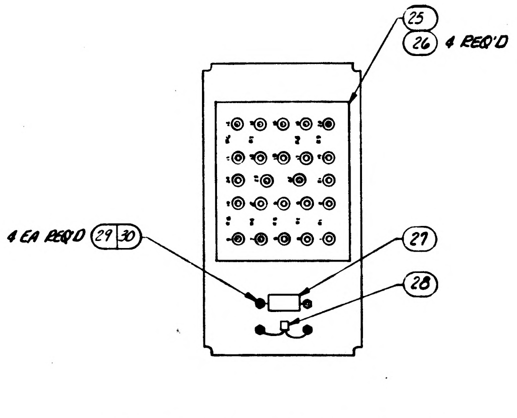
ASSEMBLE AND CALIBRATE PER ATP 1900053.

SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM (32) AND (33).

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		(1) REPLACES REV A WITH CHANGE. (2) COMPLETELY REVISED & REDRAWN PER MX-186595	TDR? 01473	21 MAY 63 5 June 63	PTW EF

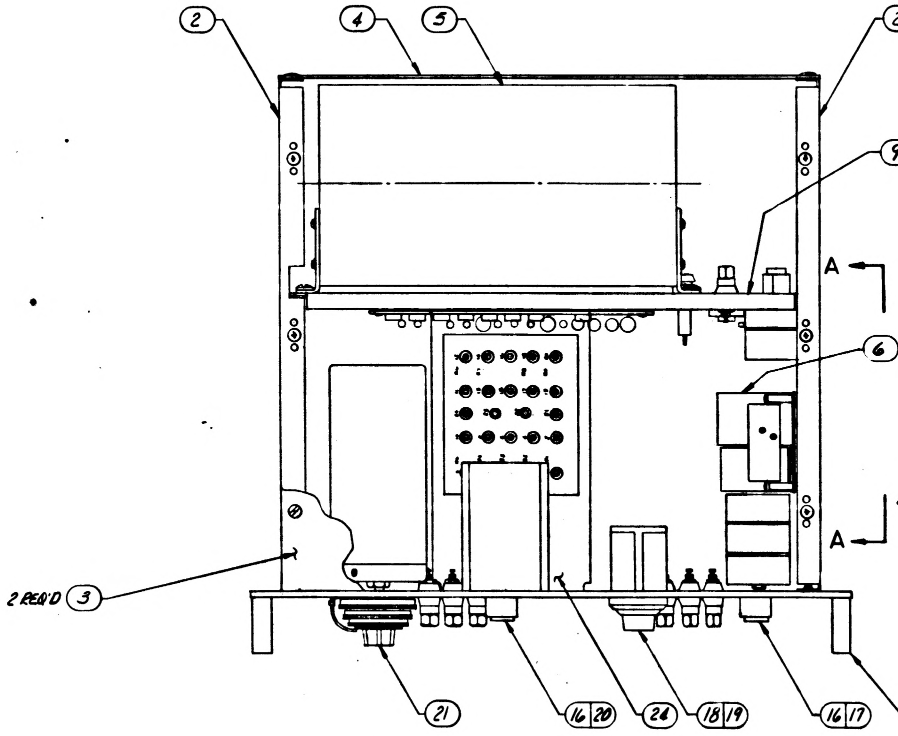


VIEW WITH BACK COVER REMOVED

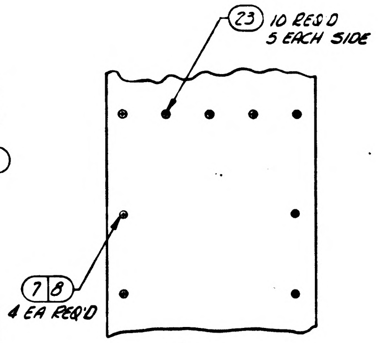


(25)
(26) 4 REQ'D
4 EA REQ'D (29)(30)
(27)
(28)

BOTTOM PANEL REMOVED FROM DRAWER

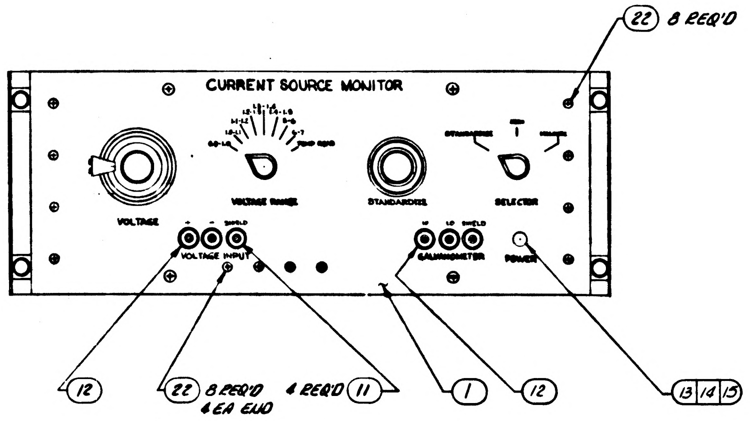


(2)
(4)
(5)
(2)
(9)
A
A
(6)
2 REQ'D (3)
(21)
(16)(20)
(24)
(18)(19)
(16)(17)
(10) 2 REQ'D



(23) 10 REQ'D 5 EACH SIDE
(7)(8)
4 EA REQ'D

PARTIAL VIEW A-A



(22) 8 REQ'D
CURRENT SOURCE MONITOR
VOLTAGE
VOLTAGE RANGE
STANDARDIZE
SELECTOR
VOLTAGE INPUT
+
-
SHIELD
GALVANOMETER
HI
LO
SHIELD
POWER
(12)
(22) 8 REQ'D 4 EA END
4 REQ'D (11)
(1)
(12)
(13)(14)(15)

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01473 **DATE** 5 June 1963

Ⓑ **REPLACES REV(A) WITH CHANGE**

			X		34	1900083	SCHEMATIC, ELECTRICAL
			AR		33	SN 60	SOLDER
			AR		32	AR	FLUX
			1		31		WIRE HARNESS
			4		30	MS35216-11	SCREW-PAN HD CROSS RECESSED
			4		29	1896962-002	TERMINAL-INSULATED
			1		28	1015810-001	RESISTOR-FIXED
			1		27	1015814-005	RESISTOR-FIXED
			4		26	AN335-4	NUT-HEX
			1		25	1015807	RESISTOR-NETWORK
			1		24	1900115	PANEL-BOTTOM (INSEP ASSY)
			10		23	MS35216-39	SCREW-PAN HD CROSS RECESSED
			24		22	AN507-832-6	SCREW-FLAT HEAD
			1		21	1015808	RESISTOR-VARIABLE
			1		20	1015859-001	SWITCH-ROTARY
			1		19	1015809-001	RESISTOR-VARIABLE
			1		18	1015915	DIAL CONTROL
			1		17	1015858-003	SWITCH-ROTARY
			2		16	MS91528-1K2B	KNOB-CONTROL ROUND
			1		15	MS25252-NE2D	LAMP-GLOW
			1		14	1896963-002	LIGHT-INDICATOR, LENS
			1		13	1896963-001	LIGHT-INDICATOR, HOUSING
			2		12	1896961-001	POST-BINDING (INSULATED)
			4		11	1896961-002	POST-BINDING (INSULATED)
			2		10	1900015-041	HANDLE ASSEMBLY
			1		9	1900122-011	CENTER PANEL ASSEMBLY
			4		8	MS35216-46	SCREW-PAN HD CROSS RECESSED
			4		7	1015860-009	SPACER, FIBER-[illegible]
			1		6	1900112-011	SUB-CHASSIS, VOLTAGE REGULATOR
			1		5	1900114-011	STANDARD CELL & THERMO-[illegible] ASSY
			1		4	1900101	COVER-BACK (INSEP ASSY)
			2		3	1900102	COVER-TOP & BOTTOM (INSEP ASSY)
			2		2	1900113	BRACKET-END (INSEP ASSY)
			1		1	1900103	PANEL-FRONT (INSEP ASSY)
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 9-APR-63
CHECKED MALIKOWSKI 10-APR-63
APPROVAL R.G. KELLY
APPROVAL A.J. KODEL 10-APR-63
NASA APPROVAL
6-4-63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

CODE IDENT NO
SIZE E
1900053
SCALE 1:2
SHEET

1900053 E

INCHES
PHOTOGRAPHIC SCALE ONLY

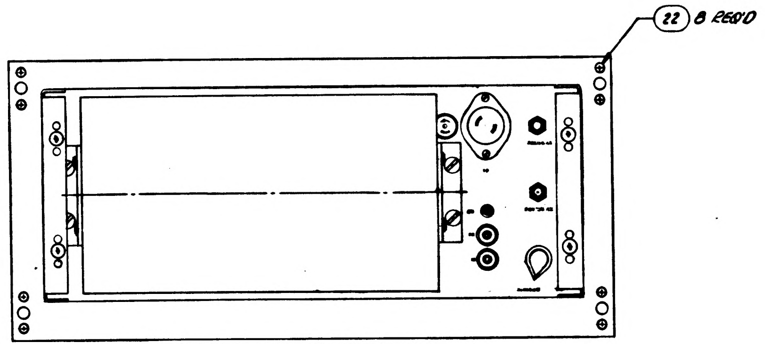
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

ASSEMBLE AND CALIBRATE PER ATP 1900053.

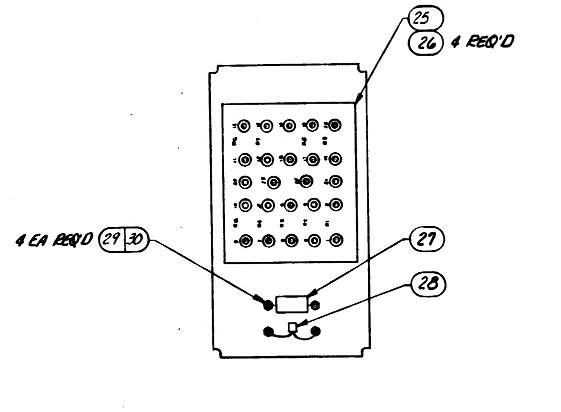
SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM ㉜ AND ㉝.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
B		(1) REPLACES REV A WITH CHANGE. (2) COMPLETELY REVISED & REDRAWN PER MXC 186595	TDRR 01473	21 MAY 63 5 June 63	PTW EF
B1	B-5 C-2	(1) REMOVED (4) 1896961-002 (ITEM ⑪) & (2) 1896961-001 (ITEM ⑫). (2) ITEM ⑱: 1015915-001 WAS 1015915.	MXC 186964	19 JUN 63	RM
B2	C-4 D-5	(1) ITEM ⑩: REMOVED (2) 1900015-041 & ADDED (2) 1900015-051. (2) ITEM ㉑: REMOVED (1) 1015808 & ADDED (1) 1015945.	MXC 187072		
B3	H-8	(1) REVISED PER MXC-187186	MXC 187186		
C	C-2	ITEM 27 P/N 1015816-005 WAS P/N 1015814-005	MXC 187576		
D		REVISED IN ACCORDANCE WITH MXC 188339	MXC 188339	25 JUL 63	G.A.W.

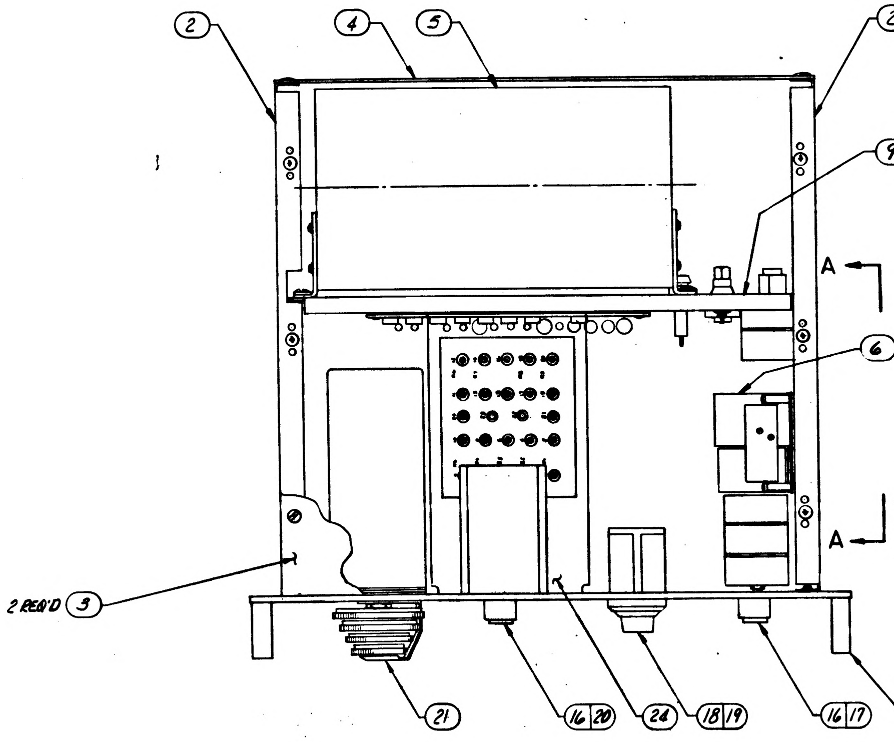
TDRR 02973

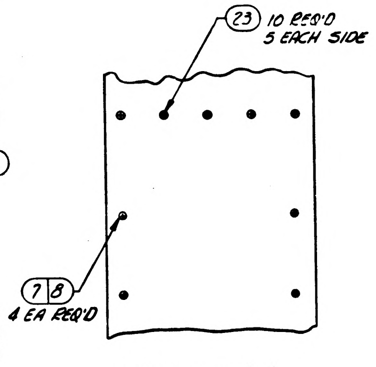


VIEW WITH BACK COVER REMOVED

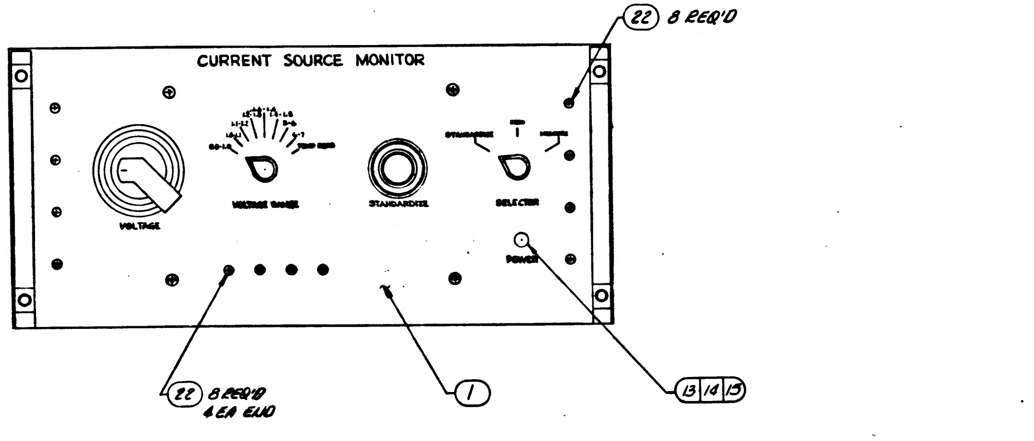


BOTTOM PANEL REMOVED FROM DRAWER





PARTIAL VIEW A-A



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01473 **DATE** 5 June 1963

Ⓑ **REPLACES REV (A) WITH CHANGE**

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
X		34	1900083	SCHEMATIC, ELECTRICAL
AR		33	SN 60	SOLDER
AR		32	AR	FLUX
1		31		WIRE HARNESS
4		30	MS35216-11	SCREW-PAN HD CROSS RECESSED
4		29	1896962-002	TERMINAL-INSULATED
1		28	1015810-001	RESISTOR-FIXED
1		27	1015816-005	RESISTOR-FIXED
4		26	AN335-4	NUT-HEX
1		25	1015807	RESISTOR-NETWORK
1		24	1900115	PANEL-BOTTOM (INSEP ASSY)
10		23	MS35216-39	SCREW-PAN HD CROSS RECESSED
24		22	AN507-832-6	SCREW-FLAT HEAD
1		21	1015945-003	RESISTOR-VARIABLE
1		20	1015859-001	SWITCH-ROTARY
1		19	1015809-001	RESISTOR-VARIABLE
1		18	1015915-001	DIAL CONTROL
1		17	1015858-003	SWITCH-ROTARY
2		16	MS91528-1K2B	KNOB-CONTROL ROUND
1		15	MS25252-NE2D	LAMP-GLOW
1		14	1896963-002	LIGHT-INDICATOR LENS
1		13	1896963-001	LIGHT-INDICATOR HOUSING
2		10	1900015-051	HANDLE ASSEMBLY
1		9	1900122-011	CENTER PANEL ASSEMBLY
4		8	MS35216-46	SCREW-PAN HD CROSS RECESSED
4		7	1015860-009	SPACER (FIBER-CYLINDRICAL)
1		6	1900112-011	SUB-CHASSIS, VOLTAGE REGULATOR
1		5	1900114-011	STANDARD CELL & THERMO-CUTE ASSY
1		4	1900101	COVER-BACK (INSEP ASSY)
2		3	1900102	COVER-TOP & BOTTOM (INSEP ASSY)
2		2	1900113	BRACKET-END (INSEP ASSY)
1		1	1900103	PANEL-FRONT (INSEP ASSY)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 9-APR-63
CHECKED MALIKOWSKI 10-APR-63
APPROVAL R.G. KELLY
APPROVAL A.J. KODEL 10-APR-63
NASA APPROVAL 6/6/63
L. Goldman 6/4/63
MIT APPROVAL W. Kupfer 6/ /63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

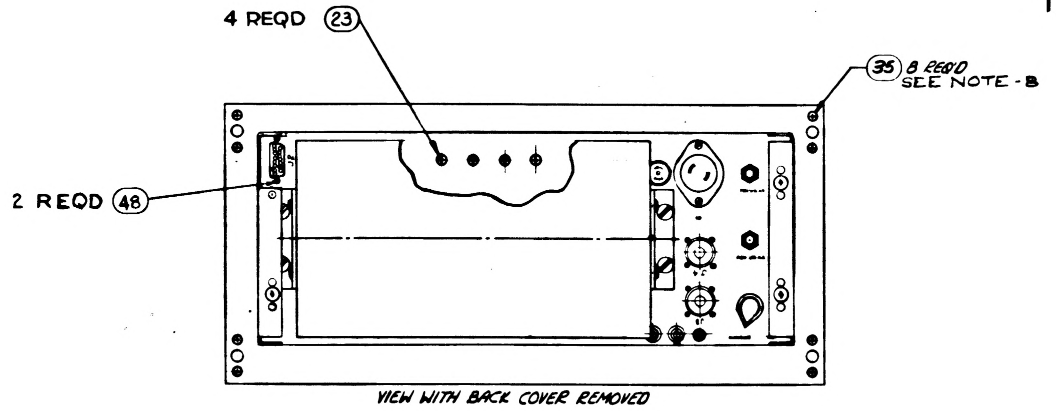
CODE IDENT NO.
SIZE E
1900053
SCALE 1:2
SHEET

1900053 D

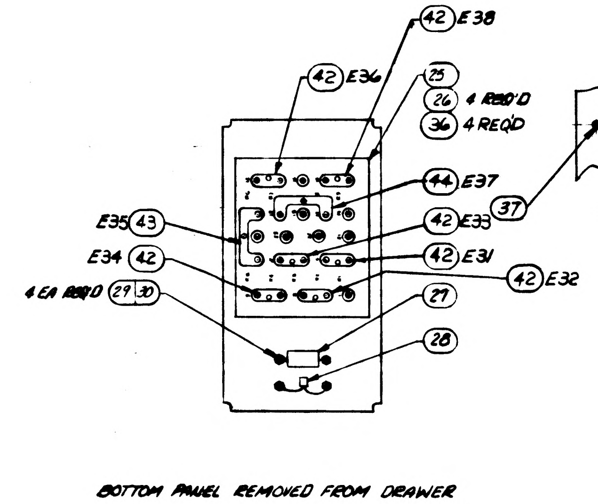
INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:

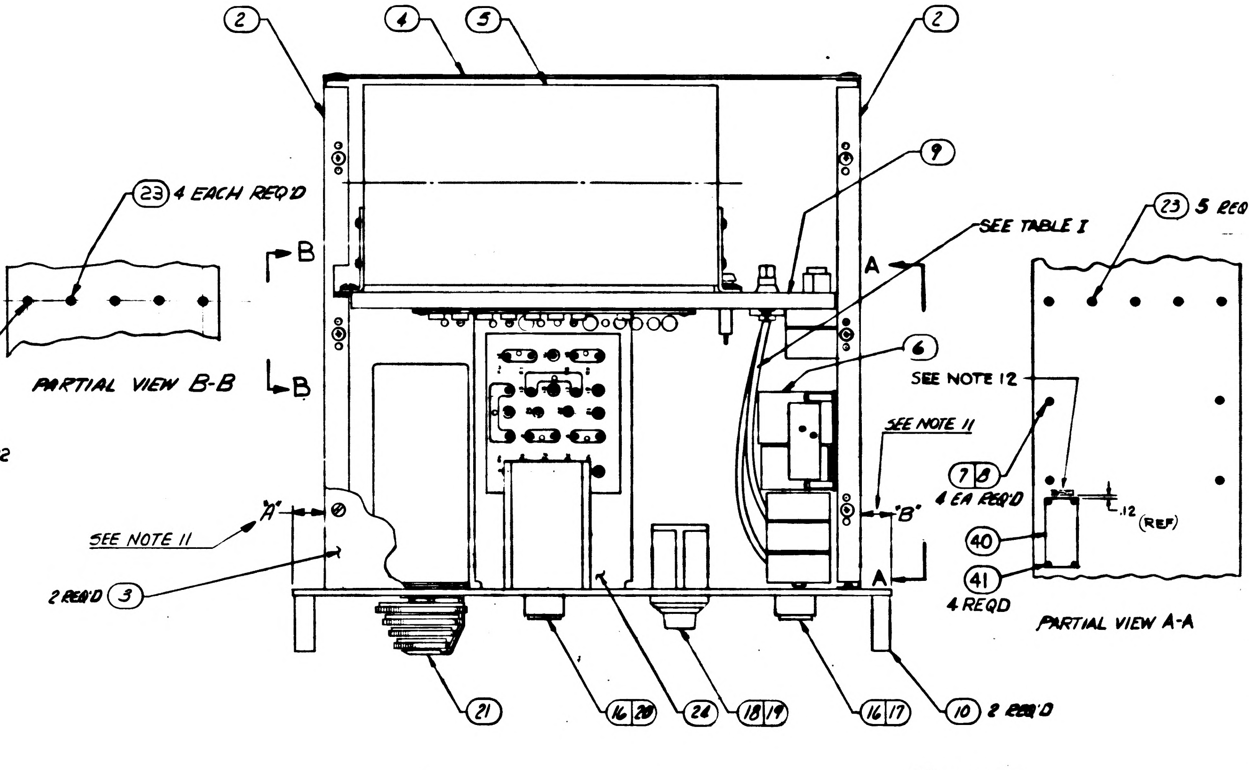
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. SOLDER PER MIL-STD-440 USING ITEMS (32) AND (33).
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK E REFERENCE DESIGNATIONS AS SHOWN ON ITEMS 42, 43 AND 44. CHARACTERS TO BE .12 HIGH, COLOR BLACK, PER ND 1002019. THESE ITEMS MUST BE SOLDERED TO HARNESS BEFORE CONNECTING TO ITEM 25.
6.
7. MARK WEIGHT OF ASSEMBLY (27 LB.) PER ND1002123 ADJACENT TO NAMEPLATE.
8. SECURE SCREWS USING ITEM (47)
9. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 40 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. DIMENSION "A" TO BE EQUAL TO DIMENSION "B" WITHIN .040.
12. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.



VIEW WITH BACK COVER REMOVED



BOTTOM PANEL REMOVED FROM DRAWER



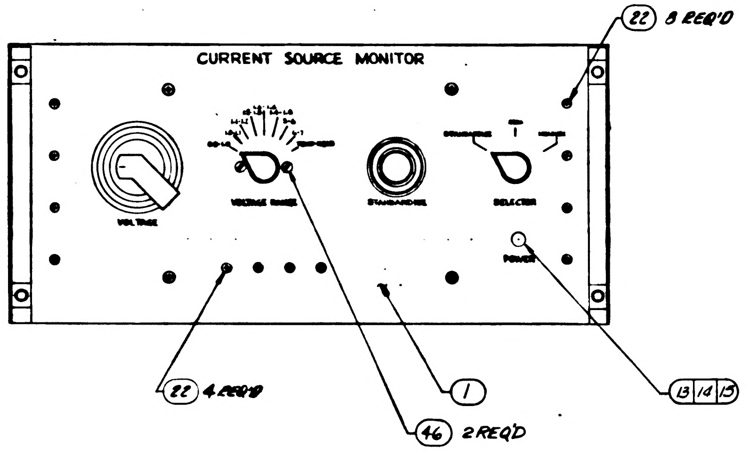


TABLE I

CABLE		CIRCUIT POINT	STRIP	TIN
J3	CENTER	S2C	3/8	YES
	PIGTAIL	S2b	3/8	YES
J4	CENTER	S2a	3/8	YES
	PIGTAIL	S2b	3/8	YES

(B) REPLACES REV A WITH CHANGE

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
R		CHANGE IN ACCORDANCE WITH CM 195510 TDRR 09209	—	22 APR 64	HC / CP
S	G-4	CHANGE IN ACCORDANCE WITH CM 195960 TDRR 09210		5 MAY 64	JC

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
B		(1) REPLACES REV A WITH CHANGE. (2) COMPLETELY REVISED & REDRAWN PER MX 186595	TDRR 01473	21 MAY 63 5 Jun 63	PW / EF
B1	B-5 C-2	(1) REMOVED (4) 1896961-002 (ITEM (11)) & (2) 1896961-001 (ITEM (12)). (2) ITEM (18): 1015915-001 WAS 1015915.	MXC 186964	19 JUN 63	RM
B2	C-4 D-5	(1) ITEM (10): REMOVED (2) 1900015-041 & ADDED (2) 1900015-051. (2) ITEM (21): REMOVED (1) 1015808 & ADDED (1) 1015945.	MXC 187072		
B3	H-8	(1) REVISED PER MXC-187186	MXC 187186		
C	C-2	ITEM 27 P/N 1015816-005 WAS P/N 1015814-005	MXC 187576		
D		REVISED IN ACCORDANCE WITH MXC 188339	MXC 188339	25 JUL 63	G.A.M.
		TDRR 02973			
E	C-2 H-5 B-5	CHANGED IN ACCORDANCE WITH MXC 189388	—	5 SEP 63	PW / J.E.G.
F	C2 C4 C5	CHANGED IN ACCORDANCE WITH MXC 189597	—	9 SEP 63	PW / J.E.G.
—	—	ADDED CUSTOMERS DATA (V7-63)	—	9 SEP 63	PW / J.E.G.
G	-	CHANGE IN ACCORDANCE WITH MXC-190552	-	OCT 63	MG
H	-	CHANGE IN ACCORDANCE WITH MXC 190927	—	63	
J	-	CHANGE IN ACCORDANCE WITH MXC 192011 TDRR 07442	-	26 DEC 63	T.P.
K	-	CHANGE IN ACCORDANCE WITH MXC 192073	-	10 JAN 64	T.P.
L	-	CHANGE IN ACCORDANCE WITH MXC 192487 TDRR 07443	-	10 JAN 64	T.P.
M		CHANGE IN ACCORDANCE WITH 194 45 07444	-	JAN 64	
N		CHANGE IN ACCORDANCE WITH 94558 REVISED PER TDR 07445		31 JAN 64	
P		CHANGE IN ACCORDANCE WITH CM 195375 REVISED CUSTOMER DATA (V2-64)	-	15 APRIL 64	JC

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01473 DATE 5 June 1963

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 4	2		48	1016126-2	LOCKING SCREW-FEMALE
	AR		47	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
	2		46	AN507-832-6(1896998-064)	SCREW, FLAT HEAD
	X		45	ATP 1900053	ASSEMBLY & TEST PROCEDURE
	1		44	1900180	JUMPER STRAP
	1		43	1900179	JUMPER STRAP
	6		42	1900178	JUMPER STRAP
	4		41	AN535-00-4(1897109-004)	SCREW, DRIVE, ROUND HEAD
	1		40	1901304-133	NAMEPLATE
	1		39	1900276	WIRE LIST CC
	1		38	1900275	WIRE HARNESS A
	1		37	MS35216-30	SCREW PAN HD CROSS RECESSED
	4		36	MS35333-74	WASHER LOCK
SEE NOTE 4	8		35	1015831-253	SCREW FLAT HD
	X		34	1900083	SCHEMATIC, ELECTRICAL
	AR		33	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		32	QQ-S-571 MIL-F-14256	FLUX TYPE AR (ES-2175 TYPE 1OR2) FLUX (ES-2798)
	4		30	MS35216-11	SCREW-PAN HD CROSS RECESSED
	4		29	SE190D01(1896962-002)	TERMINAL-INSULATED MIL-T-55155
SEE NOTE 4	1		28	1015810-001	RESISTOR-FIXED
	1		27	1015816-005	RESISTOR-FIXED
	4		26	AN335-4(1896987-040)	NUT-HEX
SEE NOTE 4	1		25	1015807	RESISTOR-NETWORK
	1		24	1900115	PANEL-BOTTOM (INSEP ASSY)
	13		23	MS35216-40	SCREW-PAN HD CROSS RECESSED
	12		22	AN507-832-8(1896998-084)	SCREW-FLAT HEAD
SEE NOTE 4	1		21	1015945-003	RESISTOR-VARIABLE
	1		20	1015859-001	SWITCH-ROTARY
SEE NOTE 4	1		19	1015809-001	RESISTOR-VARIABLE
SEE NOTE 4	1		18	1015915-001	DIAL CONTROL
	1		17	1015858-003	SWITCH-ROTARY
	2		16	2K2B(1897080-023)	KNOB-CONTROL, ROUND, MS 91528
	1		15	NE20(1897066-001)	LAMP-GLOW, MS 25252
	1		14	LH74(1896963-002)	LIGHT-INDICATOR, LENS, MIL-L-3661
	1		13	LC13WT(1896963-001)	LIGHT-INDICATOR, HOUSING, MIL-L-3661
	2		10	1900015-051	HANDLE ASSEMBLY
	1		9	1900122-011	CENTER PANEL ASSEMBLY
	4		8	MS35216-47	SCREW-PAN HD, CROSS RECESSED
SEE NOTE 4	4		7	1015860-009	SPACER (FIBER-CYLINDRICAL)
	1		6	1900112-011	SUB-CHASSIS, VOLTAGE REGULATOR
	1		5	1900114-011	STANDARD CELL & THERMO-CNTR ASSY
	1		4	1900101	COVER-BACK (INSEP ASSY)
	2		3	1900102	COVER-TOP & BOTTOM (INSEP ASSY)
	2		2	1900113	BRACKET-END (INSEP ASSY)
	1		1	1900103	PANEL-FRONT (INSEP ASSY)

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900145-011	1900145-011	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 9-APR-63
CHECKED MALIKOWSKI 10-APR-63
APPROVAL R.G. KELLY
APPROVAL A.J. KODEL 10-APR-63
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

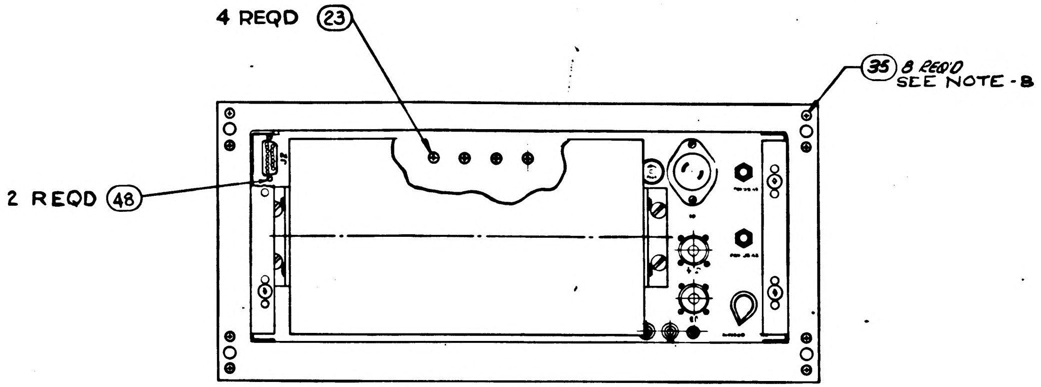
CURRENT SOURCE MONITOR

CODE IDENT NO.
SIZE E
1900053
SCALE 1:2
SHEET

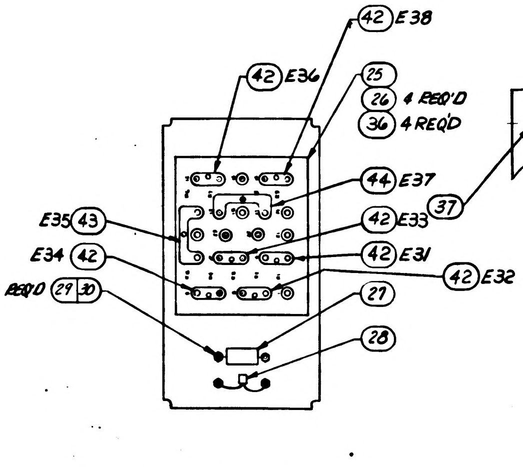
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
U		REPLACES "T" WITH CHANGE PER TDRR 10224		2-1/6-64	

NOTES:

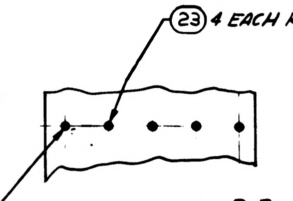
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. SOLDER PER MIL-STD-440 USING ITEMS (32) AND (33).
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK E REFERENCE DESIGNATIONS AS SHOWN ON ITEMS 42, 43 AND 44. CHARACTERS TO BE .12 HIGH, COLOR BLACK, PER ND 1002019. THESE ITEMS MUST BE SOLDERED TO HARNESS BEFORE CONNECTING TO ITEM 25.
6.
7. MARK WEIGHT OF ASSEMBLY (27 LB.) PER ND1002123 ADJACENT TO NAMEPLATE.
8. SECURE SCREWS USING ITEM (47)
9. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 40 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. DIMENSION "A" TO BE EQUAL TO DIMENSION "B" WITHIN .040.
12. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.



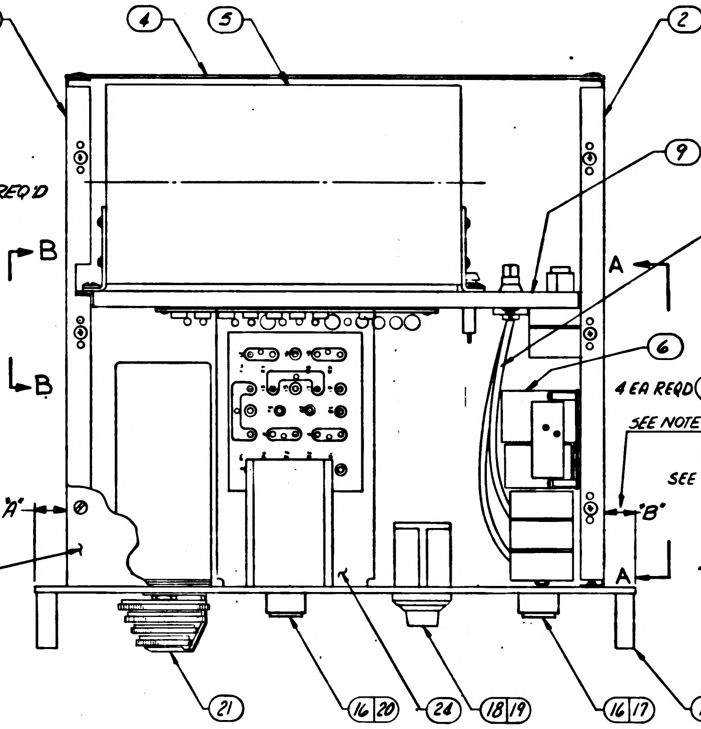
VIEW WITH BACK COVER REMOVED

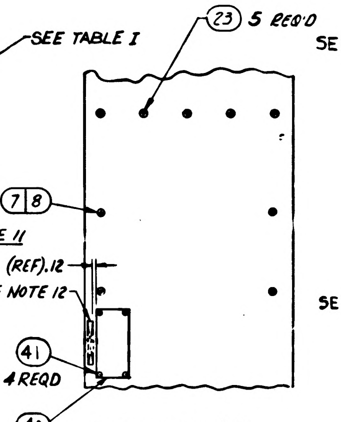


BOTTOM PANEL REMOVED FROM DRAWER



PARTIAL VIEW B-B

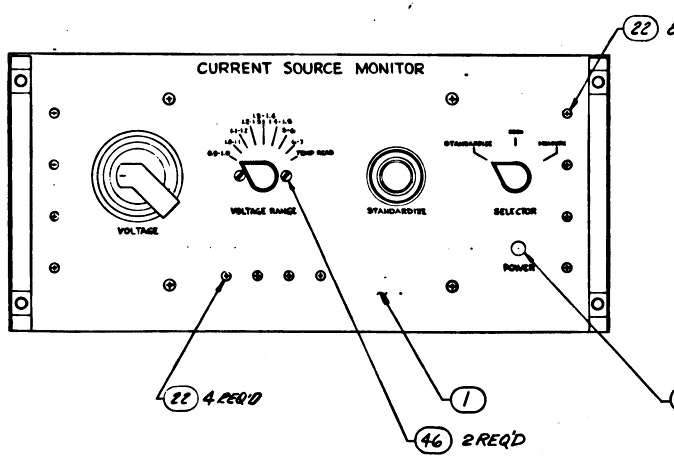




PARTIAL VIEW A-A

TABLE I

	CABLE	CIRCUIT POINT	STRIP	TIN
J3	CENTER	S2C	3/8	YES
	PIGTAIL	S2b	3/8	YES
J4	CENTER	S2a	3/8	YES
	PIGTAIL	S2b	3/8	YES



(U) REPLACES REV T WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01473 DATE 5 June 1963

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 4				2		48	1016126-2	LOCKING SCREW-FEMALE
				AR		47	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
				2		46	AN507-832-6(1896998-064)	SCREW, FLAT HEAD
				X		45	ATP 1900053	ASSEMBLY & TEST PROCEDURE
				1		44	1900180	JUMPER STRAP
				1		43	1900179	JUMPER STRAP
				6		42	1900178	JUMPER STRAP
				4		41	AN535-00-4(1897109-004)	SCREW, DRIVE, ROUND HEAD
				1		40	1901304-133	NAMEPLATE
				1		39	1900276	WIRE LIST CC
				1		38	1900275	WIRE HARNESS A
				1		37	MS35216-39	SCREW PAN HD CROSS RECESSED
				4		36	MS35333-74	WASHER LOCK
SEE NOTE 4				8		35	1015831-253	SCREW FLAT HD
				X		34	1900083	SCHEMATIC, ELECTRICAL
				AR		33	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				AR		32	QQ-S-571 MIL-F-14256	FLUX TYPE AR (ES-2175 TYPE 1 OR 2) FLUX (ES-2798)
				4		30	MS35216-11	SCREW-PAN HD. CROSS RECESSED
				4		29	SE190D01(1896962-002)	TERMINAL-INSULATED MIL-T-55155
SEE NOTE 4				1		28	1015810-001	RESISTOR-FIXED
				1		27	1015816-005	RESISTOR-FIXED
				4		26	AN335-4(1896987-040)	NUT-HEX
SEE NOTE 4				1		25	1015807	RESISTOR-NETWORK
				1		24	1900115	PANEL-BOTTOM (INSEP ASSY)
				13		23	MS35216-40	SCREW-PAN HD CROSS RECESSED
				12		22	AN507-832-8(1896998-0[illegible])	SCREW-FLAT HEAD
SEE NOTE 4				1		21	1015945-003	RESISTOR-VARIABLE
				1		20	1015859-001	SWITCH-ROTARY
SEE NOTE 4				1		19	1015809-001	RESISTOR-VARIABLE
SEE NOTE 4				1		18	1015915-001	DIAL CONTROL
				1		17	1015858-003	SWITCH-ROTARY
				2		16	2K2B(1897080-023)	KNOB-CONTROL, ROUND, MS 91528
				1		15	NE20(1897066-001)	LAMP-GLOW, MS 25252
				1		14	LH74(1896963-002)	LIGHT-INDICATOR, HOUSING, MIL-L-3661
				1		13	LC13WT(1896963-001)	LIGHT-INDICATOR, LENS, MIL-L-3661
				2		10	1900015-051	HANDLE ASSEMBLY
				1		9	1900122-011	CENTER PANEL ASSEMBLY
				4		8	MS35216-47	SCREW-PAN HD, CROSS RECESSED
SEE NOTE 4				4		7	1015860-009	SPACER (FIBER-CYLINDRICAL)
				1		6	1900112-011	SUB-CHASSIS, VOLTAGE REGULATOR
				1		5	1900114-011	STANDARD CELL & THERMO-CNTR ASSY
				1		4	1900101	COVER-BACK (INSEP ASSY)
				2		3	1900102	COVER-TOP & BOTTOM (INSEP ASSY)
				2		2	1900113	BRACKET-END (INSEP ASSY)
				1		1	1900103	PANEL-FRONT (INSEP ASSY)

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900145-011	1900145-011	

APPLICATION

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DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 9-APR-63
CHECKED MALIKOWSKI 10-23
APPROVAL R.G. KELLY
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

CODE IDENT NO.
SIZE E
1900053
SCALE 1:2
SHEET 1 OF 1

1900053 U

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ U		REPLACES "T" WITH CHANGE PER TDRR 10224		2 JUL 64	
V		REVISED PER TDRR 10873		17 JUL 66	R.

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

3. SOLDER PER MIL-STD-440 USING ITEMS (32) AND (33).
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK E REFERENCE DESIGNATIONS AS SHOWN ON ITEMS 42, 43 AND 44. CHARACTERS TO BE .12 HIGH, COLOR BLACK, PER ND 1002019. THESE ITEMS MUST BE SOLDERED TO HARNESS BEFORE CONNECTING TO ITEM 25.

6.
7. MARK WEIGHT OF ASSEMBLY (27 LB.) PER ND1002123 ADJACENT TO NAMEPLATE.
8. SECURE SCREWS USING ITEM (47)
9. MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM 40 IN ACCORDANCE WITH ND1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
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11. DIMENSION "A" TO BE EQUAL TO DIMENSION "B" WITHIN .040.
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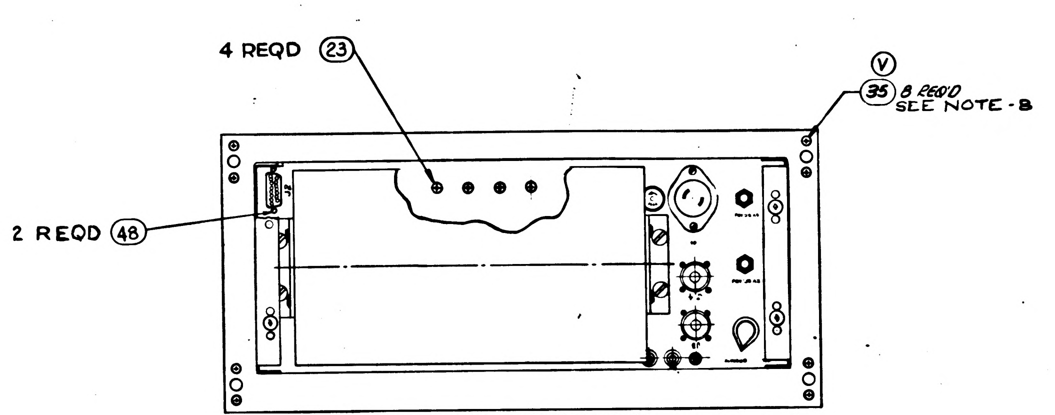
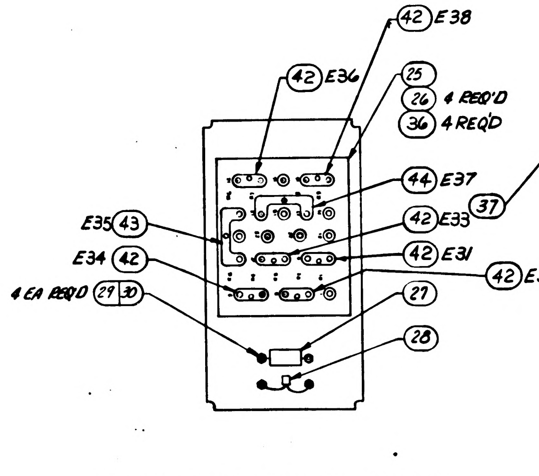
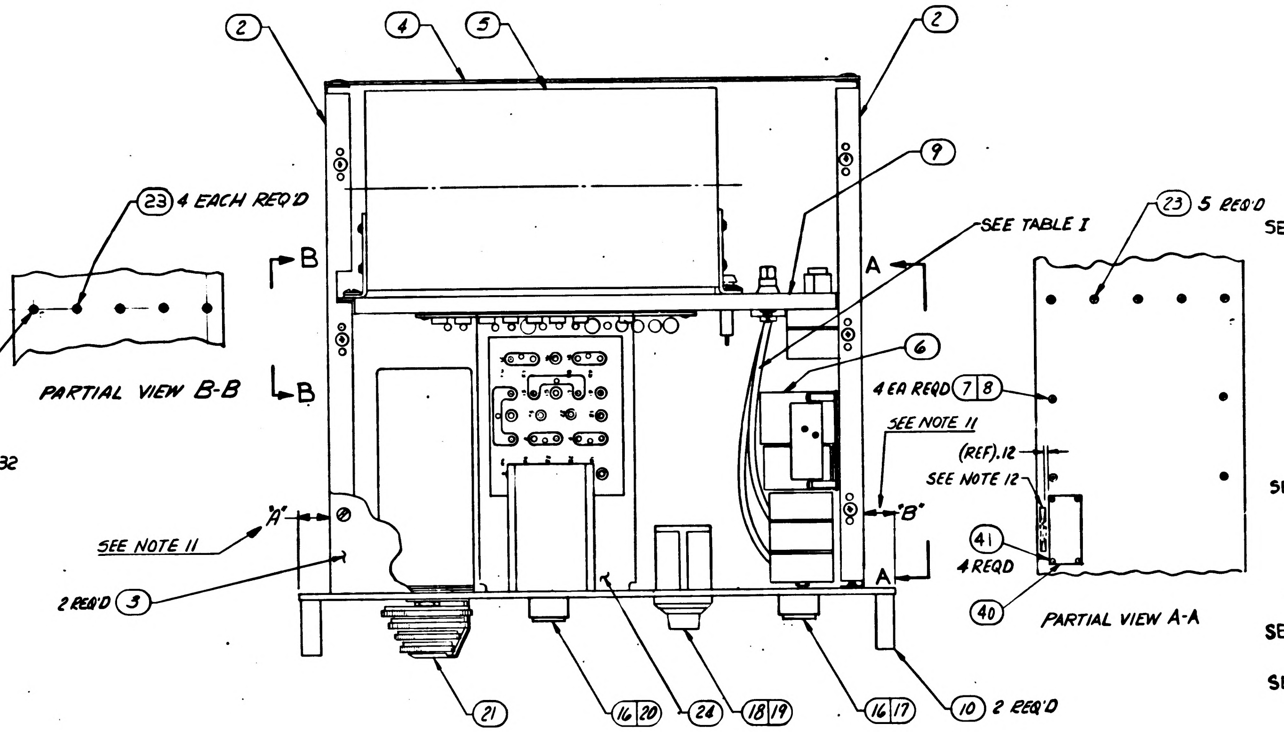


VIEW WITH BACK COVER REMOVED



BOTTOM PANEL REMOVED FROM DRAWER



PARTIAL VIEW B-B

PARTIAL VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01473 DATE 5 June 1963

					011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 4					2		48	1016126-2	LOCKING SCREW-FEMALE
					AR		47	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
					2		46	AN507-832-6(1896998-064)	SCREW, FLAT HEAD
					X		45	ATP 1900053	ASSEMBLY & TEST PROCEDURE
					1		44	1900180	JUMPER STRAP
					1		43	1900179	JUMPER STRAP
					6		42	1900178	JUMPER STRAP
					4		41	AN535-00-4(1897109-004)	SCREW, DRIVE, ROUND HEAD
					1		40	1901304-133	NAMEPLATE
					1		39	1900276	WIRE LIST CC
					1		38	1900275	WIRE HARNESS A
					1		37	MS35216-39	SCREW PAN HD CROSS RECESSED
					4		36	MS35333-74	WASHER LOCK
SEE NOTE 4					8		35	AN507C832R12	(1897003-568) SCREW, FLAT HD.
					X		34	1900083	SCHEMATIC, ELECTRICAL
					AR		33	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
					AR		32	QQ-S-571 MIL-F-14256	FLUX TYPE AR (ES-2175 TYPE 1AR2) FLUX (ES-2798)
					4		30	MS35216-11	SCREW-PAN HD. CROSS RECESSED
					4		29	SE190D01(1896962-002)	TERMINAL-INSULATED MIL-T-55155
SEE NOTE 4					1		28	1015810-001	RESISTOR-FIXED
					1		27	1015816-005	RESISTOR-FIXED
					4		26	AN335-4(1896987-040)	NUT-HEX
SEE NOTE 4					1		25	1015807	RESISTOR-NETWORK
					1		24	1900115	PANEL-BOTTOM (INSEP ASSY)
					13		23	MS35216-40	SCREW-PAN HD CROSS RECESSED
					12		22	AN507-832-8(1896998-0[illegible])	SCREW-FLAT HEAD
SEE NOTE 4					1		21	1015945-003	RESISTOR-VARIABLE
					1		20	1015859-001	SWITCH-ROTARY
SEE NOTE 4					1		19	1015809-001	RESISTOR-VARIABLE
SEE NOTE 4					1		18	1015915-001	DIAL CONTROL
					1		17	1015858-003	SWITCH-ROTARY
					2		16	2K2B(1897080-023)	KNOB-CONTROL, ROUND, MS 91528
					1		15	NE20(1897066-001)	LAMP-GLOW, MS 25252
					1		14	LH74(1896963-002)	LIGHT-INDICATOR, HOUSING, MIL-L-3661
					1		13	LC13WT(1896963-001)	LIGHT-INDICATOR, LENS, MIL-L-3661
					2		10	1900015-051	HANDLE ASSEMBLY
					1		9	1900122-011	CENTER PANEL ASSEMBLY
					4		8	MS35216-47	SCREW-PAN HD, CROSS RECESSED
SEE NOTE 4					4		7	1015860-009	SPACER (FIBER-CYLINDRICAL)
					1		6	1900112-011	SUB-CHASSIS, VOLTAGE REGULATOR
					1		5	1900114-011	STANDARD CELL & THERMO-CNTR ASSY
					1		4	1900101	COVER-BACK (INSEP ASSY)
					2		3	1900102	COVER-TOP & BOTTOM (INSEP ASSY)
					2		2	1900113	BRACKET-END (INSEP ASSY)
					1		1	1900103	PANEL-FRONT (INSEP ASSY)

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

1900053 V

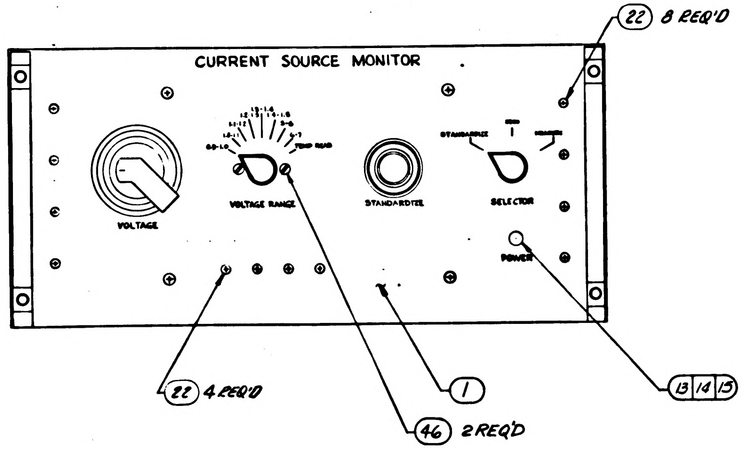


TABLE I

CABLE		CIRCUIT POINT	STRIP	TIN
J3	CENTER	S2C	3/8	YES
	PIGTAIL	S2b	3/8	YES
J4	CENTER	S2a	3/8	YES
	PIGTAIL	S2b	3/8	YES

Ⓤ REPLACES REV T WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900145-011	1900145-011	

APPLICATION

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TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 9-APR-63
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APPROVAL R.G. KELLY
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MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

CODE IDENT NO.
SIZE E
1900053
SCALE 1:2
SHEET 1 OF 1

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
Ⓜ U		REPLACES "T" WITH CHANGE PER TDRR 10224		2 JUL 64	
Ⓜ V		REVISED PER TDRR 10873		17 JUL 64	
W		REVISED PER TDRR 11420		11 AUG 64	

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3. SOLDER PER MIL-STD-440 USING ITEMS ㉜ AND ㉝.
4. VENDOR ITEM, SEE SPECIFICATION CONTROL DRAWING.
5. MARK E REFERENCE DESIGNATIONS AS SHOWN ON ITEMS 42, 43 AND 44. CHARACTERS TO BE .12 HIGH, COLOR BLACK, PER ND 1002019. THESE ITEMS MUST BE SOLDERED TO HARNESS BEFORE CONNECTING TO ITEM 25.
6.
7. MARK WEIGHT OF ASSEMBLY (27 LB.) PER ND1002123 ADJACENT TO NAMEPLATE.
8. SECURE SCREWS USING ITEM ㊼
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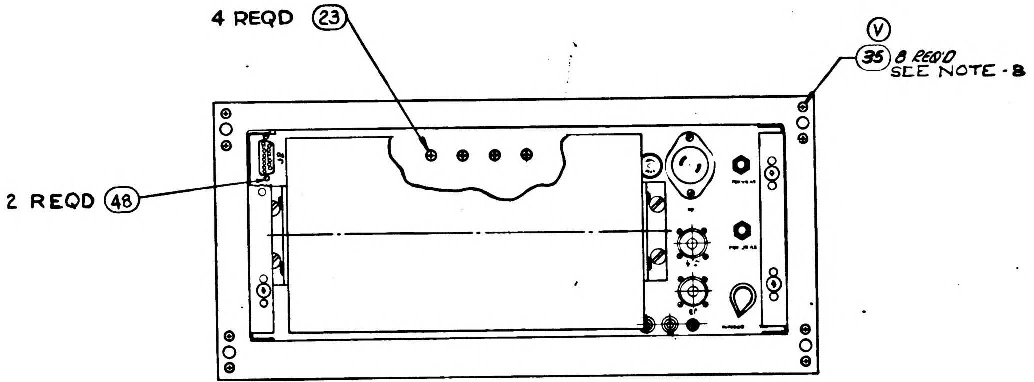
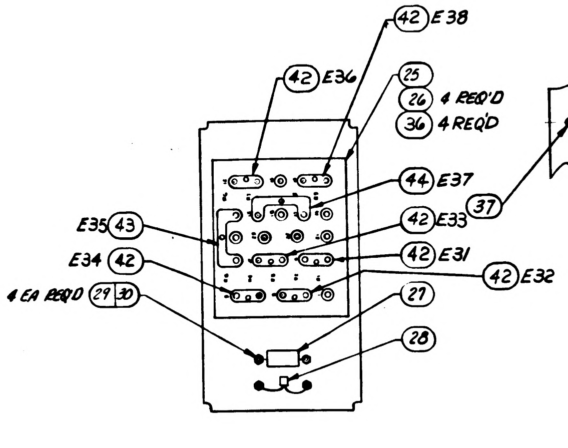
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. DIMENSION "A" TO BE EQUAL TO DIMENSION "B" WITHIN .040.
12. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
13. CONNECTOR P2 SHALL NOT BE CONNECTED TO J2 AND LEAD A6 SHALL NOT BE CONNECTED A1-A10 UNTIL INSTRUCTED TO DO SO IN PROCUREMENT SPECIFICATION PS1900053.
14. ANY ADJUSTMENT OF NUTS SECURING JUMPER STRAPS ON RATIO SET A5 REQUIRES PERFORMANCE OF RATIO SET CALIBRATION PARAGRAPH OF PS1900053.



VIEW WITH BACK COVER REMOVED



BOTTOM PANEL REMOVED FROM DRAWER

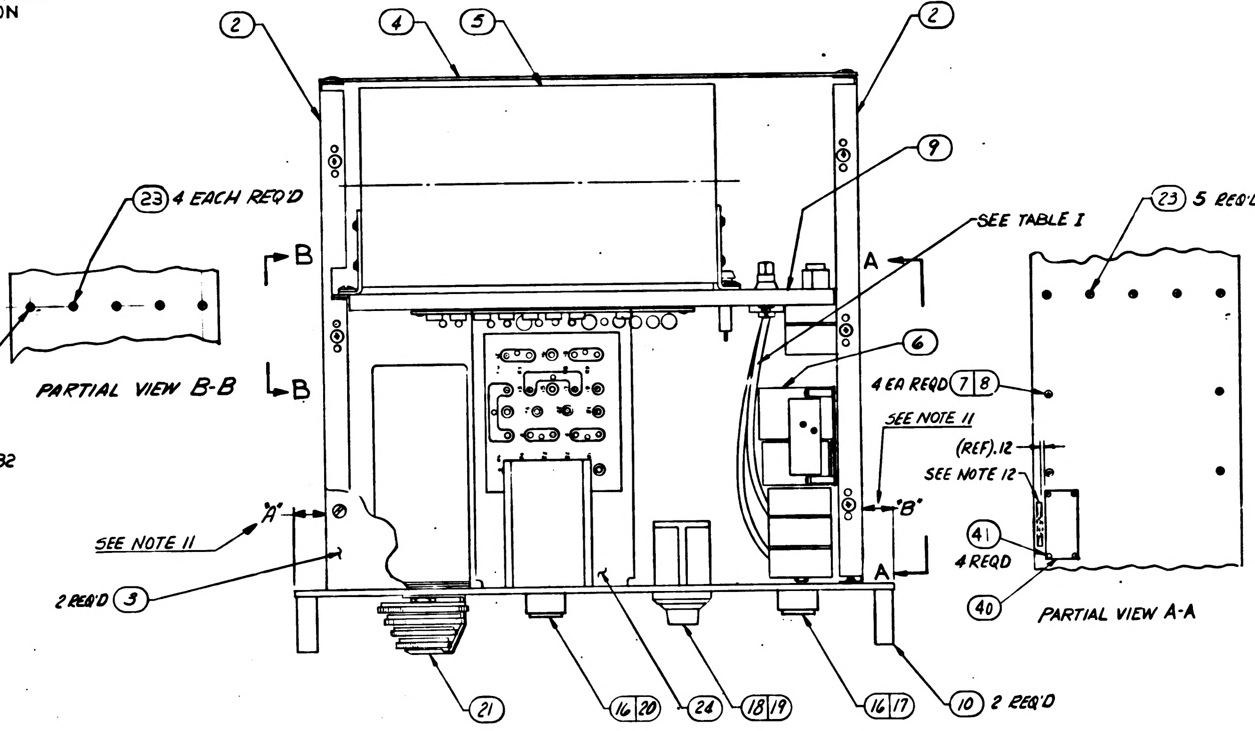


TABLE I

CABLE		CIRCUIT POINT	STRIP	TIN
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	PIGTAIL	S2b	3/8	YES
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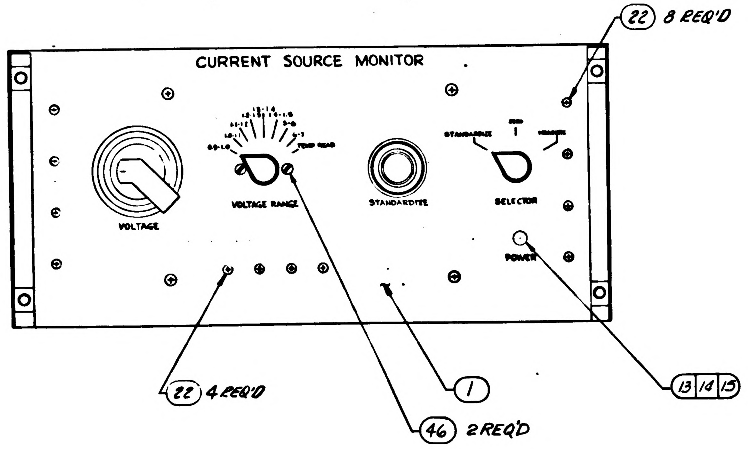
	PIGTAIL	S2b	3/8	YES



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CLASS B RELEASE TDR No. 01473 DATE 5 June 1963

	QTY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 4	2		48	1016126-2	LOCKING SCREW-FEMALE
	AR		47	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
	2		46	AN507-832-6(1896998-061)	SCREW, FLAT HEAD
	X		45	PS1900053	PROCUREMENT SPECIFICATION
	1		44	1900180	JUMPER STRAP
	1		43	1900179	JUMPER STRAP
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	12		22	AN507-832-8(1896998-08)	SCREW-FLAT HEAD
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	1		20	1015859-001	SWITCH-ROTARY
SEE NOTE 4	1		19	1015809-001	RESISTOR-VARIABLE
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MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. THIELE DATE 9-APR-63
CHECKED MALIKOWSKI 10-APR-63
APPROVAL R.G. KELLY
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MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

CODE IDENT NO. SIZE E 1900053
SCALE 1:2 SHEET 1 OF 1

1900053 W

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00998 DATE 24 Apr 63

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1			1015811 -001	↑ 1K .2% 5000PPM/°C ±10%
2			↑ -002	10K .1% 15 PPM/°C
1			1015810 -001	1K .1% 15 PPM/°C
1			↑ -003	146.8K .02%
1			-002	200K
1			1015815 -001	225K .05%
1			↑ -002	1MEG .05%
1			1015814-001	450K .25%
1			↑ -005	100K .01%
1			-004	80.2K .02%
1			-003	18.8K
2			-002	90K .25%
4			1015816-001	RESISTOR 50K .25%
6			1015801-001	CELL, STD UNSATURATED TYPE MINI
1			↑ -012	↑ ↑ ↑
1			-011	
1			-010	
1			-009	
4			1015812-008	RESISTOR-VARIABLE TRIMPOT
2			1015809-002	RESISTOR-VARIABLE HELIPOT
1			1010373-024	RESISTOR, VARIABLE TRIMPOT
1			1010373-019	RESISTOR, VARIABLE TRIMPOT
6			1010259	DIODE, SEMICOND. ZENER IN825
4			1010258	DIODE, SEMICOND. ZENER IN763
4			1010385	DIODE, SEMICONDUCTOR
1			1015806	TRANSFORMER, POWER
1			1015807	RESISTOR RATIO SET SRS 109
1			1015808	DEKAPOT TYPE DP 311
1			1015809-001	HELIPOT 20K 1%

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiele DATE 9 APR 63
CHECKED 10 APR 63
APPROVAL RG Kelly
APPROVAL 10 APR 63
NASA APPROVAL 4/24/63
J P Gilmore 4-24-63
MIT APPROVAL 24 Apr 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CURRENT SOURCE MONITOR

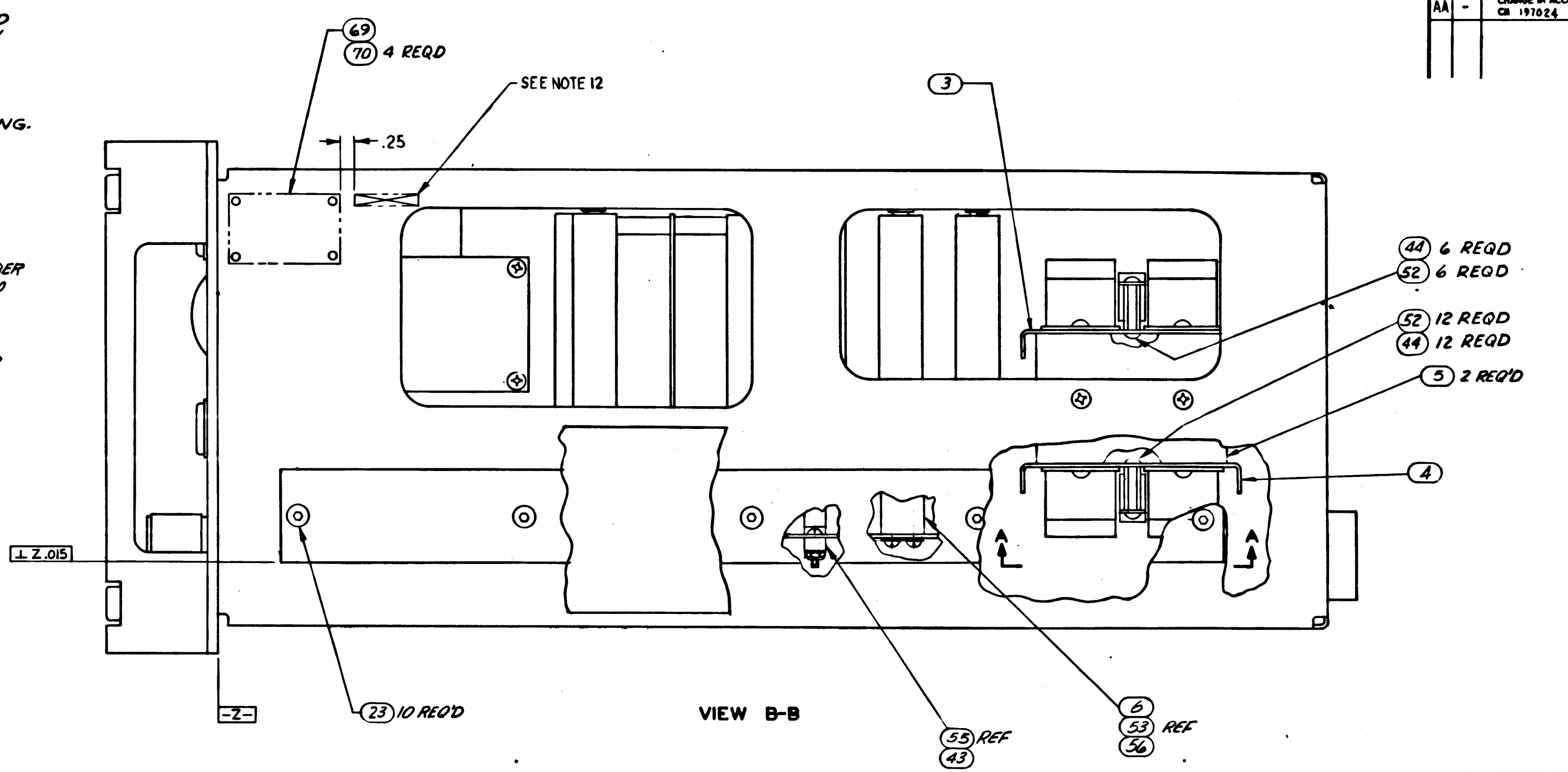
CODE IDENT NO.
SIZE D
1900053
SCALE
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

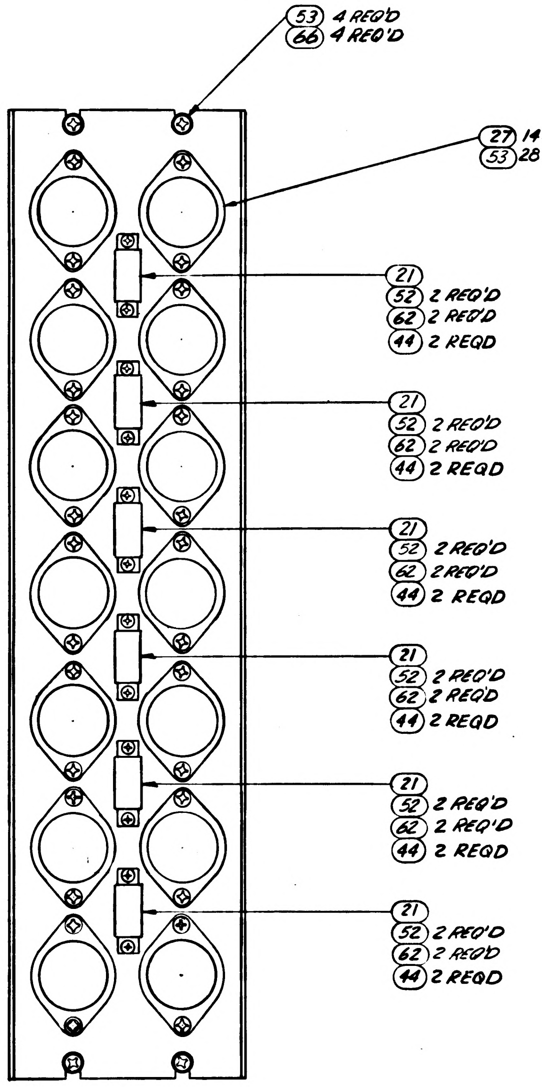
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DIMENSIONS "A" AND "B" TO BE EQUAL WITHIN .040.
3. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN ALL INSTALLATION
4. MARK WEIGHT OF ASSEMBLY (43 LBS) PER ND 1002123 ADJACENT TO NAMEPLATE LOCATION
5. SOLDER PER MIL-STD-440 USING ITEMS 59 AND 60
6. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
7.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO TO ITEM (69) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH
9. SECURE SCREWS USING ITEM (34).
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. SELECT ITEMS (71) AND (72) AS REQUIRED.
12. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
13. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
W		REPLACES REV. V WITH CHANGE PER CM 195190 REVISED PER TDR 08371	—	2 MAR 64	WR
Y		CHANDE IN ACCORDANCE WITH CM 196025 PER TDRR 08972		9 APR 64	MEM WR
Z		CHANGE IN ACCORDANCE WITH CM 196184 PER TDRR 08973		22 APR 64	PF WR
AA	-	CHANGE IN ACCORDANCE WITH CM 197024 TDRR 10716	-	5-JUNE 64	M.G. FK



VIEW B-B



PARTIAL VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 DATE 13 MAY 63

(W) REPLACES REV V WITH CHANGE

	QUANTITY REQUIRED							
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
(AA)				4		79	1016151-004	NUT-SELF-LOCKING
				1		78	1016096-012	RELAY, TIME DELAY
SEE NOTE 6 & 13				AR		77	1016005-1	SHIM-LAMINATED
				☒		76	PS 1900054	PROCUREMENT SPECIFICATION
				2		75	AN363C832	(1896990-281) NUT, SELF LOCKING
				2		74	AN960C8	(1897006-008) WASHER, FLAT
				2		73	MS35216-41	SCREW, PAN HD, CROSS RECESS
SEE NOTE 11				1		72	MS21919-DG6 THRU DG8	(1897073-106 THRU 108) CLAMP CUSHIONED LOOP
SEE NOTE 11				1		71	MS21919-DG7 THRU DG9	(1897073-107 THRU 109) CLAMP CUSHIONED LOOP
				4		70	AN535-00-4	(1897109-004) SCREW, DRIVE, ROUND HEAD.
				1		69	1901304-107	NAMEPLATE
				38		67	MS35216-27	SCREW PAN HD CROSS RECESS
				8		66	AN960C6L	WASHER-FLAT (1897006-036)
				☒		64	1900455	SCHEMATIC-ELECTRICAL
				1		63	1900185	WIRING HARNESS A
SEE NOTE 6				18		62	1016000-014	SPACER
						61		
				AR		60	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
				AR		59	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				3		58	MS91528-2K2B	(197080-023) KNOB, POINTER.
				2		57	MS90078-15-1	FUSE (2 AMP) (1897077-115)
				38		56	MS35335-30	WASHER EXT TOOTH
				26		55	MS35216-28	SCREW PAN HD CROSS RECESS
				12		54	MS35216-25	SCREW PAN HD CROSS RECESS
(AA)				64		53	MS35216-24	SCREW PAN HD CROSS RECESS
				42		52	MS35216-13	SCREW PAN HD CROSS RECESS
				12		51	MS35200-42	SCREW FL HD CROSS RECESS
				6		50	MS35200-25	SCREW FL HD CROSS RECESS
				1		46	MS26572-1	FUSE HOLDER-SPARE
				36		44	MS35335-29	WASHER, EXT TOOTH
				38		43	AN363C632	NUT-SELF LOCKING (1896990-261)
				6		42	AN363C1032	NUT-SELF LOCKING (1896990-011)

LIST OF PARTS AND MATERIALS

AA	AA
Z	Z
Y	Y
W	W
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

	QUANTITY REQUIRED							
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				AR		34	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
SEE NOTE 6				1		33	1015873-008	FUSE-HOLDER
				3		32	1015869-717	SWITCH-LIGHT
				3		31	1015869-716	SWITCH-LIGHT
				1		30	1015869-715	SWITCH-LIGHT
				1		29	1015869-714	SWITCH-LIGHT
				1		28	1015869-713	SWITCH-LIGHT
(AA)				26		27	1015837-001	RELAY 6PDT
				3		26	1015833-009	RELAY TIME DELAY
				3		25	1015832-118	RELAY 2PDT
				8		24	1015831-253	SCREW-FL HD
				10		23	1015826 304	SCREW FLAT HD
				3		22	1015825-7	SWITCH-ROTARY
				6		21	1015802-001	RELAY 2PDT
				1		20	1015791-010	SLIDE ASSY L.H.
				1		19	1015791-009	SLIDE ASSY R.H.
				6		18	1006783-45	SCREW BUTTON HD
				1		17	1900339-011	PRECISION ALIGN SERVO AMPL ASSY
				1		16	1900337-011	PRECISION ALIGN SERVO AMPL ASSY
				1		15	1900326-011	PRECISION ALIGN SERVO AMPL ASSY
				2		14	1900323-011	COMPONENT BOARD ASSY
				3		13	1900320-011	PHASE SENSITIVE ERROR DET ASSY
				1.		12	1900269-031	DUMP PROTECTION ASSY (OUTER)
				1		11	1900269-021	DUMP PROTECTION ASSY (MIDDLE)
				1		10	1900269-011	DUMP PROTECTION ASSY (INNER)
				3		9	1900300-011	GIMBAL POSITION DISPLAY ASSY
				2		8	1900015-051	HANDLE ASSY
				9		7	1900391	BRKT CIRCUIT BOARD DOUBLE
				10		6	1900390	BRKT CIRCUIT BOARD SINGLE
				2		5	1900389	BRKT SUPPORT RELAY (INSEP) ASSY
				1		4	1900388	BRKT RELAY-LOWER (INSEP) ASSY
				1		3	1900387	BRKT RELAY-UPPER (INSEP) ASSY
				1		2	1900386	FRONT PANEL
				1		1	1900385	CHASSIS (INSEP) ASSY

LIST OF PARTS AND MATERIALS

1900004-011	1900004-011	011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .020 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Fatical DATE 1 JUL 63
CHECKED 9 Jul 63
LDT APPROVAL McComas 10 Jul 63
APPROVAL 21 May 64
NASA APPROVAL 5-26-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL GIMBAL POSITION DRAWER ASSEMBLY

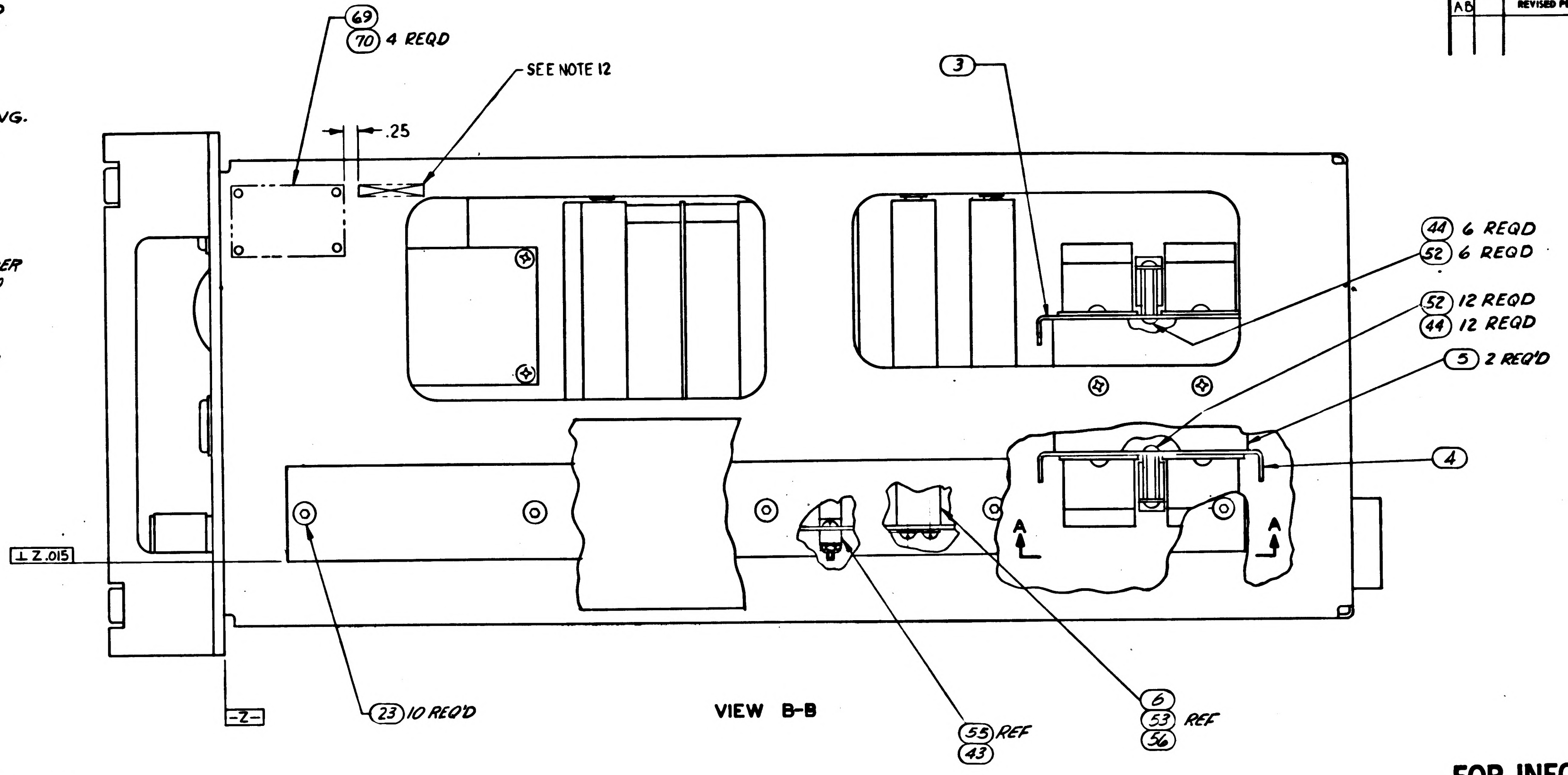
CODE IDENT NO. SIZE E 1900054
SCALE FULL SHEET 1 OF 2

1900054 AA

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DIMENSIONS "A" AND "B" TO BE EQUAL WITHIN .040.
3. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN ALL INSTALLATION
4. MARK WEIGHT OF ASSEMBLY (43 LBS) PER ND 1002123 ADJACENT TO NAMEPLATE LOCATION
5. SOLDER PER MIL-STD-440 USING ITEMS 59 AND 60
6. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
7.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO TO ITEM (69) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH
9. SECURE SCREWS USING ITEM (34).
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. SELECT ITEMS (71) AND (72) AS REQUIRED.
12. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
13. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

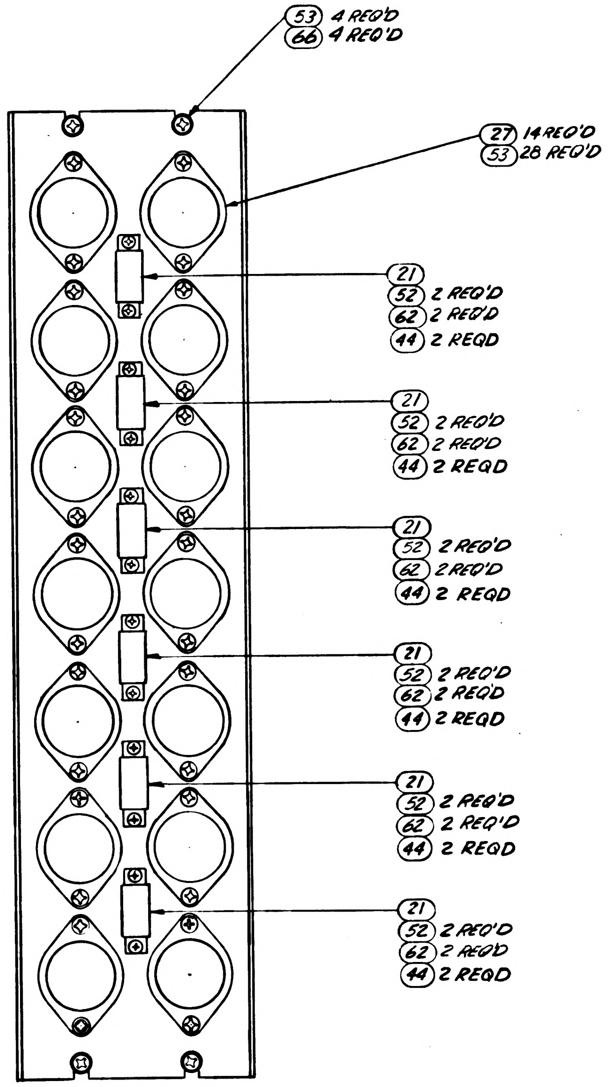
REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
W		REPLACES REV. V WITH CHANGE PER CM 195193 REVISED PER TDR 08971	—	2 MAR 64	
Y		CHANDE IN ACCORDANCE WITH CM 196025 PER TDRR 08972		8 APR 64	MEM WR
Z		CHANGE IN ACCORDANCE WITH CM 196184 PER TDRR 08973		22 APR 64	PF WR
(M) AA	-	CHANGE IN ACCORDANCE WITH CM 197024 TDRR 10716	-	5-JUNE 64	M.G.
AB		REVISED PER TDRR 10873	—	17 JUL 64	



VIEW B-B

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 DATE 15 MAY 63



PARTIAL VIEW A-A

(W) REPLACES REV V WITH CHANGE

	QUANTITY REQUIRED							
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
(AA)				4		79	1016151-004	NUT-SELF-LOCKING
				1		78	1016096-012	RELAY, TIME DELAY
SEE NOTE 6 & 13				AR		77	1016005-1	SHIM-LAMINATED
				☒		76	PS 1900054	PROCUREMENT SPECIFICATION
				2		75	AN363C832	(1896990-281) NUT, SELF LOCKING
				2		74	AN960C8	(1897006-008) WASHER, FLAT
				2		73	MS35216-41	SCREW, PAN HD, CROSS RECESS
SEE NOTE 11				1		72	MS21919-DG6 THRU DG8	(1897073-106 THRU 108) CLAMP CUSHIONED LOOP
SEE NOTE 11				1		71	MS21919-DG7 THRU DG9	(1897073-107 THRU 109) CLAMP CUSHIONED LOOP
				4		70	AN535-00-4	(1897109-004) SCREW, DRIVE, ROUND HEAD
				1		69	1901304-107	NAMEPLATE
				38		67	MS35216-27	SCREW PAN HD CROSS RECESS
				8		66	AN960C6L	WASHER-FLAT (1897006-036)
				☒		64	1900455	SCHEMATIC-ELECTRICAL
				1		63	1900185	WIRING HARNESS A
SEE NOTE 6				18		62	1016000-014	SPACER
						61		
				AR		60	MIL-F-14256	FLUX (ES-2798)
							QQ-S-571	FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
				AR		59	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				3		58	MS91528-2K2B	(197080-023) KNOB, POINTER.
				2		57	MS90078-15-1	FUSE (2AMP) (1897077-115)
				38		56	MS35335-30	WASHER EXT TOOTH
				26		55	MS35216-28	SCREW PAN HD CROSS RECESS
				12		54	MS35216-25	SCREW PAN HD CROSS RECESS
(AA)				64		53	MS35216-24	SCREW PAN HD CROSS RECESS
				42		52	MS35216-13	SCREW PAN HD CROSS RECESS
				12		51	MS35200-42	SCREW FL HD CROSS RECESS
				6		50	MS35200-25	SCREW FL HD CROSS RECESS
				1		46	MS26572-1	FUSE HOLDER-SPARE
				36		44	MS35335-29	WASHER, EXT TOOTH
				38		43	AN363C632	NUT-SELF LOCKING (1896990-261)
				6		42	AN363C1032	NUT-SELF LOCKING (1896990-011)

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED							
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				AR		34	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
SEE NOTE 6				1		33	1015873-008	FUSE-HOLDER
SEE NOTE 6				3		32	1015869-717	SWITCH-LIGHT
SEE NOTE 6				3		31	1015869-716	SWITCH-LIGHT
SEE NOTE 6				1		30	1015869-715	SWITCH-LIGHT
SEE NOTE 6				1		29	1015869-714	SWITCH-LIGHT
SEE NOTE 6				1		28	1015869-713	SWITCH-LIGHT
SEE NOTE 6 (AA)				26		27	1015837-001	RELAY 6PDT
SEE NOTE 6				3		26	1015833-009	RELAY TIME DELAY
SEE NOTE 6				3		25	1015832-118	RELAY 2PDT
SEE NOTE 6				8		24	AN507C832R12	(1897003-568) SCREW, FL HD
SEE NOTE 6				10		23	1015826 304	SCREW FLAT HD
SEE NOTE 6				3		22	1015825-7	SWITCH-ROTARY
SEE NOTE 6				6		21	1015802-001	RELAY 2PDT
SEE NOTE 6				1		20	1015791-010	SLIDE ASSY L.H.
SEE NOTE 6				1		19	1015791-009	SLIDE ASSY R.H.
SEE NOTE 6				6		18	1006783-45	SCREW BUTTON HD
				1		17	1900339-011	PRECISION ALIGN SERVO AMPL ASSY
				1		16	1900337-011	PRECISION ALIGN SERVO AMPL ASSY
				1		15	1900326-011	PRECISION ALIGN SERVO AMPL ASSY
				2		14	1900323-011	COMPONENT BOARD ASSY
				3		13	1900320-011	PHASE SENSITIVE ERROR DET ASSY
				1.		12	1900269-031	DUMP PROTECTION ASSY (OUTER)
				1		11	1900269-021	DUMP PROTECTION ASSY (MIDDLE)
				1		10	1900269-011	DUMP PROTECTION ASSY (INNER)
				3		9	1900300-011	GIMBAL POSITION DISPLAY ASSY
				2		8	1900015-051	HANDLE ASSY
				9		7	1900391	BRKT CIRCUIT BOARD DOUBLE
				10		6	1900390	BRKT CIRCUIT BOARD SINGLE
				2		5	1900389	BRKT SUPPORT RELAY (INSEP) ASSY
				1		4	1900388	BRKT RELAY-LOWER (INSEP) ASSY
				1		3	1900387	BRKT RELAY-UPPER (INSEP) ASSY
				1		2	1900386	FRONT PANEL
				1		1	1900385	CHASSIS (INSEP) ASSY

LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
AB	AA
AA	AA
Z	Z
Y	Y
W	W

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± .020 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Jatieck DATE 1 JUL 63
CHECKED 9 Jul 63
APPROVAL McComas 10 Jul 63
APPROVAL 21 May 64
NASA APPROVAL W J Rhine 5-26-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL GIMBAL POSITION DRAWER ASSEMBLY

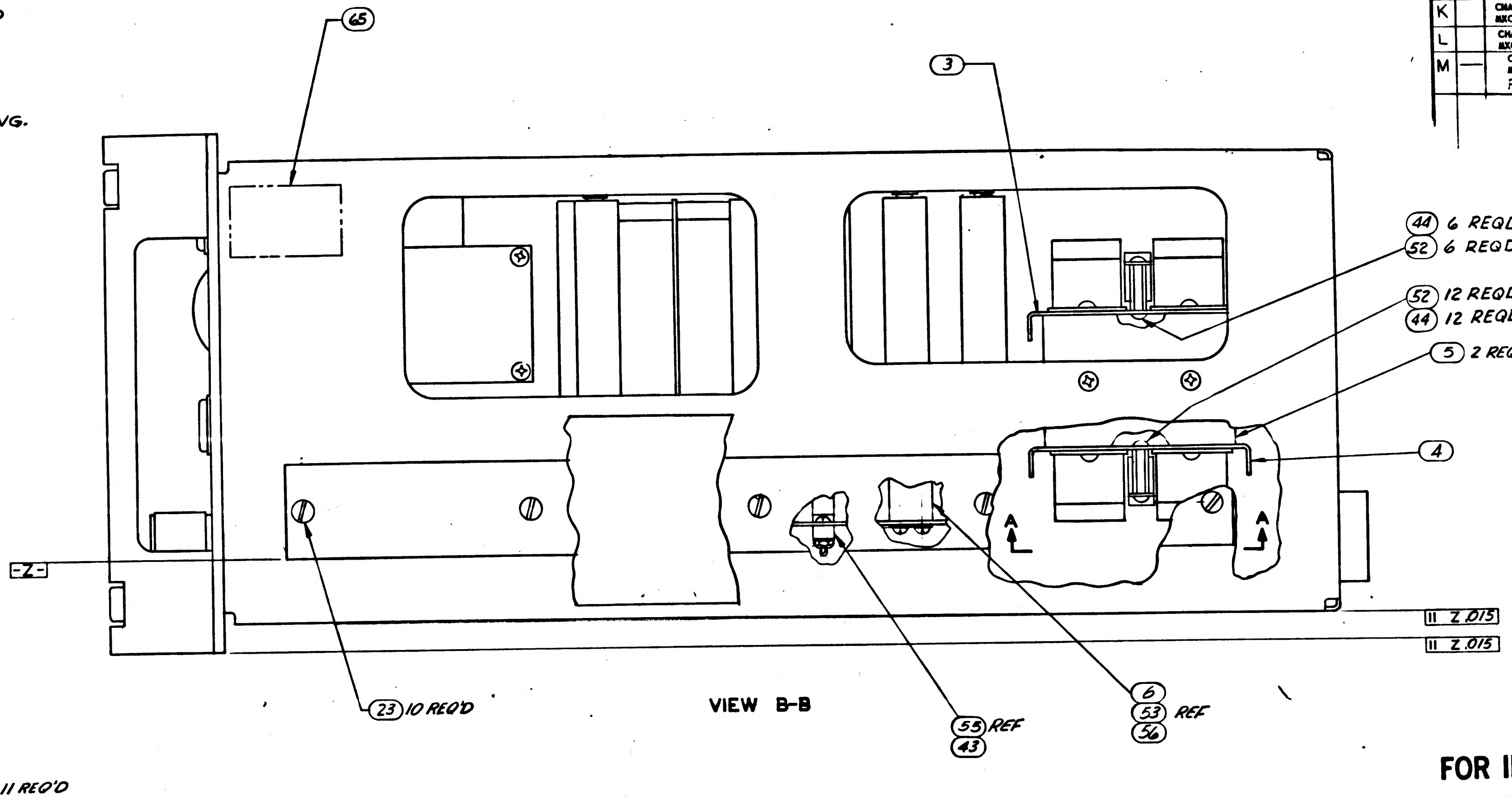
CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET 1 OF 2

1900054 AB

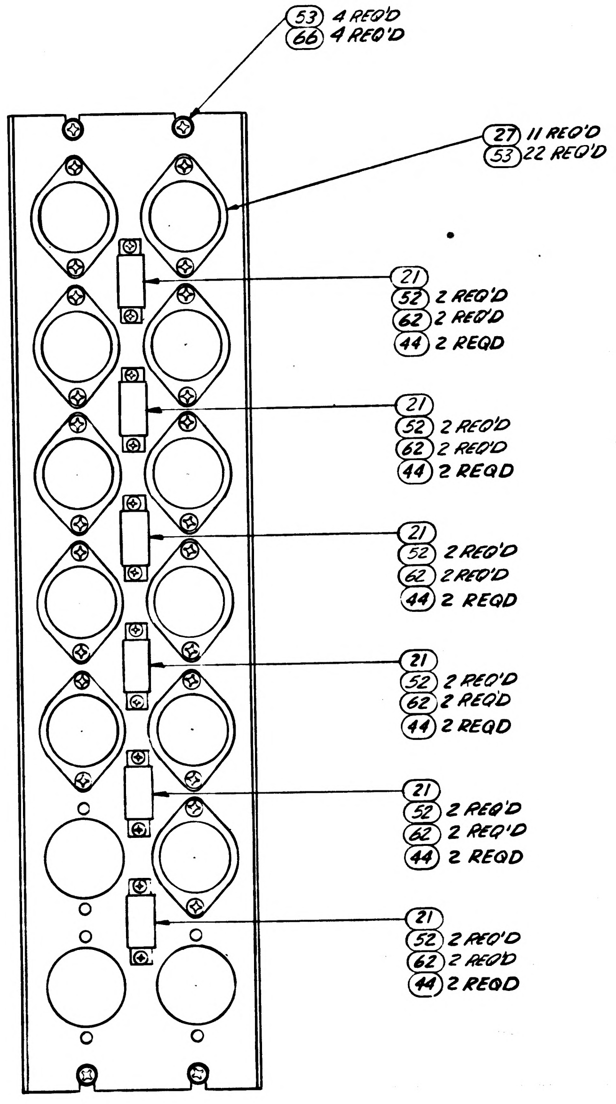
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010
3. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37 40 LB/IN ALL INSTALLATION
4. MARK WEIGHT OF ASSEMBLY PER ND1002123 ADJACENT TO NAMEPLATE LOCATION
5. SOLDER PER MIL-STD-440 USING ITEMS 59 AND 60
6. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
7. SERIALIZE PER ND1002023.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPLACES REVISION "E" WITH CHANGE PER MXC 188220 REVISED PER TDRR 02574		30 JUL 63	C.A.V.
G		CHANGED IN ACCORDANCE WITH MXC-190116		25-SEP-63	M.F.N. EF
H		CHANGED IN ACCORDANCE WITH MXC-190288		25-SEP-63	M.F.N. EF
J		CHANGED IN ACCORDANCE WITH MXC-190553		8 OCT 63	
K		CHANGE IN ACCORDANCE WITH MXC 190753		16 OCT 63	J.J.J.
L		CHANGE IN ACCORDANCE WITH MXC 190927		16 OCT 63	
M	—	CHANGE IN ACCORDANCE WITH MXC 191630 PER TDRR 01670	—	30 OCT 63	R.E.



VIEW B-B



PARTIAL VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 DATE

SHEET 1	SHEET 2
M	M
L	J
K	J
J	J
H	—
G	G
F	F

REVISION STATUS OF SHEETS

Ⓕ REPLACES REV(E) WITH CHANGE

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
4		70	AN535-00-4	SCREW, DRIVE, ROUNDHEAD
1		69	1900705	NAMEPLATE, APOLLO, G&N
X		68	ATP 1900054	SPEC-ASSY TEST PROCEDURE
38		67	MS35216-27	SCREW PAN HD CROSS RECESS
8		66	AN960C6L	WASHER-FLAT (1897006-036)
1		65		NAMEPLATE
X		64	1900455	SCHEMATIC-ELECTRICAL
1		63	1900185	WIRING HARNESS A
18		62	1016000-014	SPACER
		61		
AR		60	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
AR		59	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
3		58	MS91528-2K2B	KNOB-POINTER
2		57	MS90078-11-1	FUSE (2 AMP) (1897077-111)
38		56	MS35335-30	WASHER EXT TOOTH
26		55	MS35216-28	SCREW PAN HD CROSS RECESS
12		54	MS35216-25	SCREW PAN HD CROSS RECESS
56		53	MS35216-24	SCREW PAN HD CROSS RECESS
42		52	MS35216-13	SCREW PAN HD CROSS RECESS
12		51	MS35200-42	SCREW FL HD CROSS RECESS
6		50	MS35200-25	SCREW FL HD CROSS RECESS
1		46	MS26572-1	FUSE HOLDER-SPARE
36		44	MS35335-29	WASHER, EXT TOOTH
38		43	AN363C632	NUT-SELF LOCKING (1896990-261)
6		42	AN363C1032	NUT-SELF LOCKING (1896990-011)

LIST OF PARTS AND MATERIALS

SEE NOTE 6 (items 18 through 33)

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1		33	1015873-008	FUSE-HOLDER
3		32	1015869-717	SWITCH-LIGHT
3		31	1015869-716	SWITCH-LIGHT
1		30	1015869-715	SWITCH-LIGHT
1		29	1015869-714	SWITCH-LIGHT
1		28	1015869-713	SWITCH-LIGHT
22		27	1015837-001	RELAY 6PDT
3		26	1015833-009	RELAY TIME DELAY
3		25	1015832-118	RELAY 2PDT
8		24	1015831-257	SCREW-FL HD
10		23	1015826-296	SCREW FLAT HD
3		22	1015825-7	SWITCH-ROTARY
6		21	1015802-001	RELAY 2PDT
1		20	1015791-010	SLIDE ASSY L.H
1		19	1015791-009	SLIDE ASSY R.H.
6		18	1006783-45	SCREW BUTTON HD
1		17	1900339-011	PRECISION ALIGN SERVO AMP ASSY
1		16	1900337-011	PRECISION ALIGN SERVO [illegible]
1		15	1900326-011	PRECISION ALIGN SERVO AMP ASSY
2		14	1900323-011	COMPONENT BOARD ASSY
3		13	1900320-011	PHASE SENSITIVE ERROR [illegible]
1		12	1900269-031	DUMP PROTECTION ASSY [illegible]
1		11	1900269-021	DUMP PROTECTION ASSY [illegible]
1		10	1900269-011	DUMP PROTECTION ASSY [illegible]
3		9	1900300-011	GIMBAL POSITION DISPLAY ASSY
2		8	1900015-051	HANDLE ASSY
9		7	1900391	BRKT CIRCUIT BOARD DOUBLE
10		6	1900390	BRKT CIRCUIT BOARD SINGLE
2		5	1900389	BRKT SUPPORT RELAY (INSEP ASSY)
1		4	1900388	BRKT RELAY-LOWER (INSEP ASSY)
1		3	1900387	BRKT RELAY-UPPER (INSEP ASSY)
1		2	1900386	FRONT PANEL
1		1	1900385	CHASSIS (INSEP) ASSY

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Fatieck DATE 1 JUL 63
CHECKED 9 Jul 63
APPROVAL McComas 10 Jul 63
APPROVAL 7/19/63
NASA APPROVAL 8-14-63
MIT APPROVAL 14 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

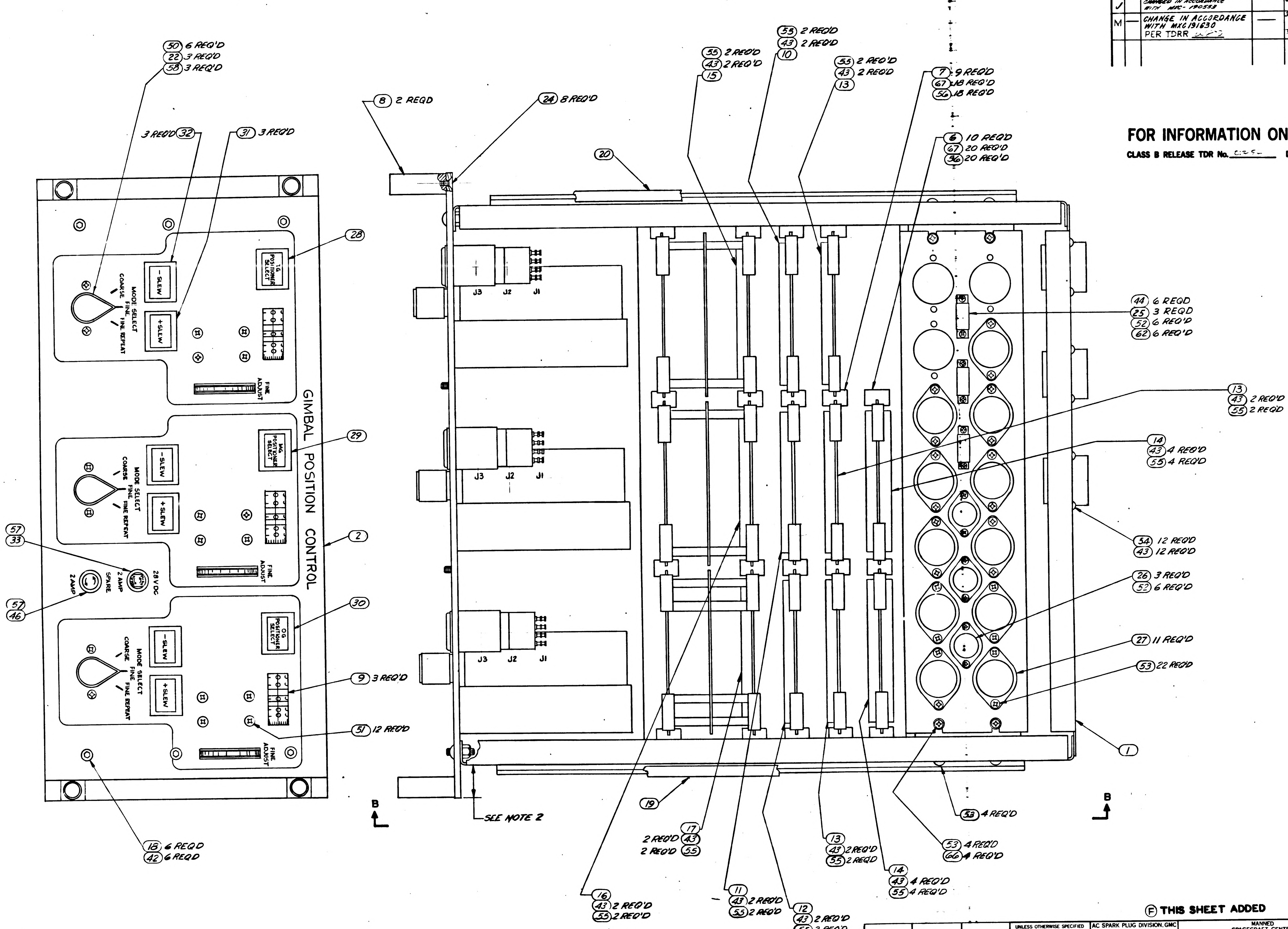
CONTROL GIMBAL POSITION DRAWER ASSEMBLY

CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		THIS SHEET ADDED PER MXC 188220 REVISE PER TDRR 02574		30 JUL 63	C A M
G		CHANGED IN ACCORDANCE WITH MXC-190116		25 SEP 63	
J		CHANGED IN ACCORDANCE WITH MXC-190553		8 OCT 63	
M	—	CHANGE IN ACCORDANCE WITH MXC 191630 PER TDRR	—	30 OCT 63	EL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ______ **DATE**



GIMBAL POSITION CONTROL
IG POSITIONER SELECT
MG POSITIONER SELECT
OG POSITIONER SELECT
-SLEW
+SLEW
MODE SELECT
COARSE
FINE
FINE REPEAT
FINE ADJUST
28V DC
2 AMP
SPARE
2 AMP
J3
J2
J1
B
B
SEE NOTE 2
50 6 REQ'D
22 3 REQ'D
58 3 REQ'D
3 REQ'D 32
31 3 REQ'D
8 2 REQD
24 8 REQ'D
20
55 2 REQ'D
43 2 REQ'D
15
55 2 REQ'D
43 2 REQ'D
10
55 2 REQ'D
43 2 REQ'D
13
7 9 REQ'D
67 18 REQ'D
56 18 REQ'D
6 10 REQ'D
67 20 REQ'D
56 20 REQ'D
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9 3 REQ'D
51 12 REQ'D
57
33
57
46
18 6 REQD
42 6 REQD
44 6 REQD
25 3 REQD
52 6 REQ'D
62 6 REQ'D
13
43 2 REQ'D
55 2 REQ'D
14
43 4 REQ'D
55 4 REQ'D
54 12 REQ'D
43 12 REQ'D
26 3 REQ'D
52 6 REQ'D
27 11 REQ'D
53 22 REQ'D
1
53 4 REQ'D
53 4 REQ'D
66 4 REQ'D
19
17
2 REQ'D 43
2 REQ'D 55
16
43 2 REQ'D
55 2 REQ'D
11
43 2 REQ'D
55 2 REQ'D
12
43 2 REQ'D
55 2 REQ'D
13
43 2 REQ'D
55 2 REQ'D
14
43 4 REQ'D
55 4 REQ'D

Ⓕ **THIS SHEET ADDED**

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± —— ± —— ± ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Petricek DATE JUL 63
CHECKED 9 Jul 63
APPROVAL 10 Jul 63
APPROVAL 7/14/63
NASA APPROVAL 7-14-63
MIT APPROVAL 14 Jul 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL GIMBAL POSITION
DRAWER ASSEMBLY

CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET

1900054 M

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

B 1900054

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A1		(1) ADDED 18 ITEMS TO LIST OF PARTS	S.O. 5,511	29 APR 63	
B		(1) ADDED "ASSEMBLY" TO TITLE (2) ADDED "SLIDE ASSY L.H., SLIDE ASSY R.H. HANDLE ASSY, AND SCREW FLAT HEAD, HEX SOCKET" TO LIST OF MATERIAL.	DRR 01256	14 MAY 63	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 **DATE**

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1				SLIDE ASS'Y, L.H.
			1				SLIDE ASSY, R.H.
			2				HANDLE ASS'Y
			6			1010372-14	DIODE, ZENER HZ 8543
			24			IN486 BM	DIODE PER MIL-S-19500/118A
			3			CL33CD101MN3	CAPACITOR (PER MIL-C-3965-B)
			1			CL33CE600MN3	CAPACITOR (PER MIL-C-3965-B)
			12			RC20GF752 J	RESISTOR (PER MIL-R-11-D)
			6			RC20GF682 J	RESISTOR (PER MIL-R-11-D)
			6			1010252	TRANSISTOR (2N2642)
			3			1010273	(2N1724)
			3			1010271	(ST5506)
			3			1010396	(2N1259)
			3			1010266	(2N2605)
						1015826 296	SCREW, FLAT HEAD, HEX SOCKET
			15			1010 270	TRANSISTOR (2N1613)
			1			MS 3127-24-61PX	CONNECTOR
			1			MS 3127-24-61PW	CONNECTOR
			1			MS 3127-24-61P	CONNECTOR
			3			1015802	RELAY - 2PDT
			35			1015837-001	RELAY - 6PDT

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 9 APR 63
DATE 10 APR 63
CHECKED
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 5/15/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL, GIMBAL POSITION, ASSEMBLY

CODE IDENT NO.
SIZE D
1900054
SCALE
SHEET

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10780-F

D 1900054

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A1		(1) ADDED 18 ITEMS TO LIST OF PARTS	S.O. 51511	29 APR 63	Tomassy
B		1) ADDED "ASSEMBLY" TO TITLE 2) ADDED " SLIDE ASSY L.H., SLIDE ASSY R.H. HANDLE ASSY, AND SCREW, FLAT HEAD, HEX SOCKET" TO LIST OF MATERIAL.	TDRR 01256	14 MAY 63	WK
B1		CHANGE IN ACCORDANCE WITH MXC 186522		5 JUN 63	IEFS RLW
B2		CHANGE IN ACCORDANCE WITH MXC 186924		5 JUN 63	IEFS RLW
C		CHANGE IN ACCORDANCE WITH MXC 187343		21 JUN 63	IEFS
D		CHANGE IN ACCORDANCE WITH MXC 187893		11 JUL 63	C.A.M.
E		REPLACED WITH CHANGE BY REVISON "F" PER MXC 188220	Rev TDR R 02574	29 JUL 63	C.A.M.

14 Aug 1963 WK

Ⓜ

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3			1015989	RESISTOR - VARIABLE 50K
3			RC32GF122J	(1896953-065) RESISTOR 1.2K ±5% 1W (PER MIL-R-11)
3			1015833-009	RELAY, TIME DELAY
3			RN60B4990F	(1896977-260) 499Ω ±1% 1/8W
3			RN60B3012F	(1896977-431) 30.1K
12			RN60B2002F	(1896977-414) 20K
3			RN60B3323F	(1896977-531) 332K ±1% 1/8W
6			RC20GF242J	(1896952-058) 2.4K
3			RC07GF752J	(1896952-070) 7.5K
3			RC07GF512J	(1896952-066) 511K 1/2W
6			RC07GF393J	39K
6			RC07GF224J	220K
3			RC07GF123J	12K
3			RC07GF204J	200K
6			RC07GF513J	51K
9			RC07GF203J	20K
3			RC07GF103J	RESISTOR 10K ±5% 1/4W
6			1015941-6	DIODE, VOLTAGE REGULATOR 3.3V 1/4W
3			1900300-011	GIMBAL POSITION DISPLAY ASSEMBLY
3			-173	
1			-172	
1			-171	
1			-170	
1			-169	
1			-168	
1			-167	
4			1015957-166	CONNECTOR, RECEPTACLE ELECTRICAL
3			-173	
1			-172	
1			-171	
1			-170	
1			-169	
1			-168	
1			-167	
4			1015956-166	CONNECTOR, ADAPTOR ELECTRICAL
6			1015872-1	HEAT SINK
12			CTM 104 VAJ	(1896957-215) CAPACITOR 0.1µf 100V
3			CL33CE060MN3	(1896955-007) CAPACITOR 6.0µf 15VDC NON POLAR
3			CL20CJ030TD3	(1896956-) CAPACITOR 3.0µf 5VDC POLAR
3			CH05A1NC474K	(1896958-106) CAPACITOR 0.1µf ±10% 600V

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
3			RN65B1004F	(1896975-577) RESISTOR 1MEG Ω 1% 1/4W
10			1015798-010	NUT, ANCHOR
8			1015831-256	SCREW, FLAT HD HEX SOCKET
15			1015898-017	TRANSFORMER, AUDIO
15			1015934-1	TRANSISTOR, 2N1132
3			1015947	TRANSFORMER, AUDIO
3			1015946-008	REACTOR 10h.
3			1015946-009	REACTOR 25h.
3			1015942-426	RESISTOR 1.0Ω ±1% 2W
3			1015926-020	500Ω ±1% 3W
3			1015926-170	425Ω ±1% 3W
3			CH05A1MC205K	CAPACITOR 2µf ±10% 200V PER MIL-C-18312
1			CTM563 VAJ	0.056µf ±5% 100V PER MIL-C-27287
2			CTM 224 VAJ	0.22µf ±5% 100V
3			CTM 392 VBJ	0.0039µf ±5% 200V
3			CTM 332 VBJ	0.0033µf ±5% 200V
3			1015825-7	SWITCH ROTARY
3			RC20GF472J	RESISTOR 4.7K ±5% 1/2W PER MIL-R-11
3			RC20GF203J	20K ±5% 1/2W
6			RC20GF152J	1.5K ±5% 1/2W
6			RC20GF622J	6.2K ±5% 1/2W
3			RN65B20R0F	20.0Ω ±1% 1/4W PER MIL-R-10509
3			RN65B80R5F	82.5Ω ±1% 1/4W
6			RN60C1000F	100Ω ±1% 1/8W
3			RN65C2211F	2.21K ±1% 1/4W
3			RN65C7501F	7.5K ±1% 1/4W
3			RN60C6812F	68.1K ±1% 1/8W
3			RN60C3922F	39.2K ±1% 1/8W
6			RN60C1003F	100K ±1% 1/8W
3			RN60C6192F	61.9K ±1% 1/8W
3			RN60C1502F	15K ±1% 1/8W
3			RN75B4754F	4.75 MEG Ω ±1% 1W
3			RN60C8252F	82.5K ±1% 1/8W
3			RN60C4752F	47.5K ±1% 1/8W
9			RN65C5112F	51.1K ±1% 1/4W
15			RN60C1002F	10K ±1% 1/8W
6			RN65C4751F	4.75K ±1% 1/4W
1			RN65C3742F	37.4K ±1% 1/4W
2			RN65C4992F	49.9K ±1% 1/4W
6			RN65B1210F	121Ω ±1% 1/4W
6			RN65B1212F	12.1K ±1% 1/4W
6			RN65B47R5F	47.5Ω ±1% 1/4W
3			RN65C3322F	33.2K ±1% 1/4W
3			RN65C2002F	20K ±1% 1/4W
3			RT12C2L103	-VARIABLE (PER MIL-R-27208)
3			1015845-312	RELAY-LATCHING
2			RN60B3652F	RESISTOR (PER MIL-R-10509)
1			RN60B1272F	RESISTOR (PER MIL-R-10509)

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2			RN60B1622F	RESISTOR (PER MIL-R-10509)
1			RN60B1621F	(PER MIL-R-10509)
3			RB58CE1R0F	(PER MIL-R-93C)
6			RT12C2L203	POTENTIOMETER (PER MIL-R-27208/8)
2			CTM 224 VAJ	CAPACITOR (PER MIL-C-27287)
3			CY20C2025	(PER MIL-C-11272)
3			CP05A1KB333K3	(PER MIL-C-25)
3			CTM 474 VAJ	(PER MIL-C-27287)
6			CTM 103 VAJ	(PER MIL-C-27287)
3			1015955	TRANSFORMER, AUDIO
3			1N718	DIODE (PER MIL-E-1/1238)
9			1015941-15	
30			1N645	(PER MIL-E-1/1143)
6			1015941-6	
33			1N459	(PER-MIL-S-19500/193
9			1015935-001	TRANSISTOR (2N930)
9			1015832-118	RELAY-CURRENT SENSITIVE
3			MS91528-2K2B	KNOB
1			1015791-010	SLIDE ASS'Y, L.H.
1			1015791-009	SLIDE ASSY, R.H.
2			1900015-051	HANDLE ASS'Y
6			1015941-14	DIODE, ZENER HZ 8543
39			1N486 B	DIODE PER MIL-S-19500/118A
3			CL33CD101MN3	CAPACITOR (PER MIL-C-3965-B)
1			CL33CE600MN3	CAPACITOR (PER MIL-C-3965-B)
12			RC20GF752 J	RESISTOR (PER MIL-R-11-D)
6			RC20GF682 J	RESISTOR (PER MIL-R-11-D)
6			1015933-001	TRANSISTOR (2N2642)
3			1015936-001	(2N1724)
3			1015932	(ST5506)
3			1015929-001	(2N1259)
6			1015931	(2N2605)
10			1015826-296	SCREW, FLAT HEAD, HEX SOCKET
15			1015938	TRANSISTOR (2N1613)
1			MS 3127E-24-61PX	CONNECTOR
1			MS 3127E-24-61PW	CONNECTOR
1			MS 3127E-24-61P	CONNECTOR
6			1015802-001	RELAY - 2PDT
35			1015837-001	RELAY - 6PDT

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 **DATE**

Ⓔ **REPLACED WITH CHANGE BY REV F**

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thul DATE 9 APR 63
10 APR 63
CHECKED
APPROVAL Carpenter 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 5/14/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL,
GIMBAL POSITION,
ASSEMBLY

CODE IDENT NO.
SIZE D 1900054
SCALE
SHEET 1 of

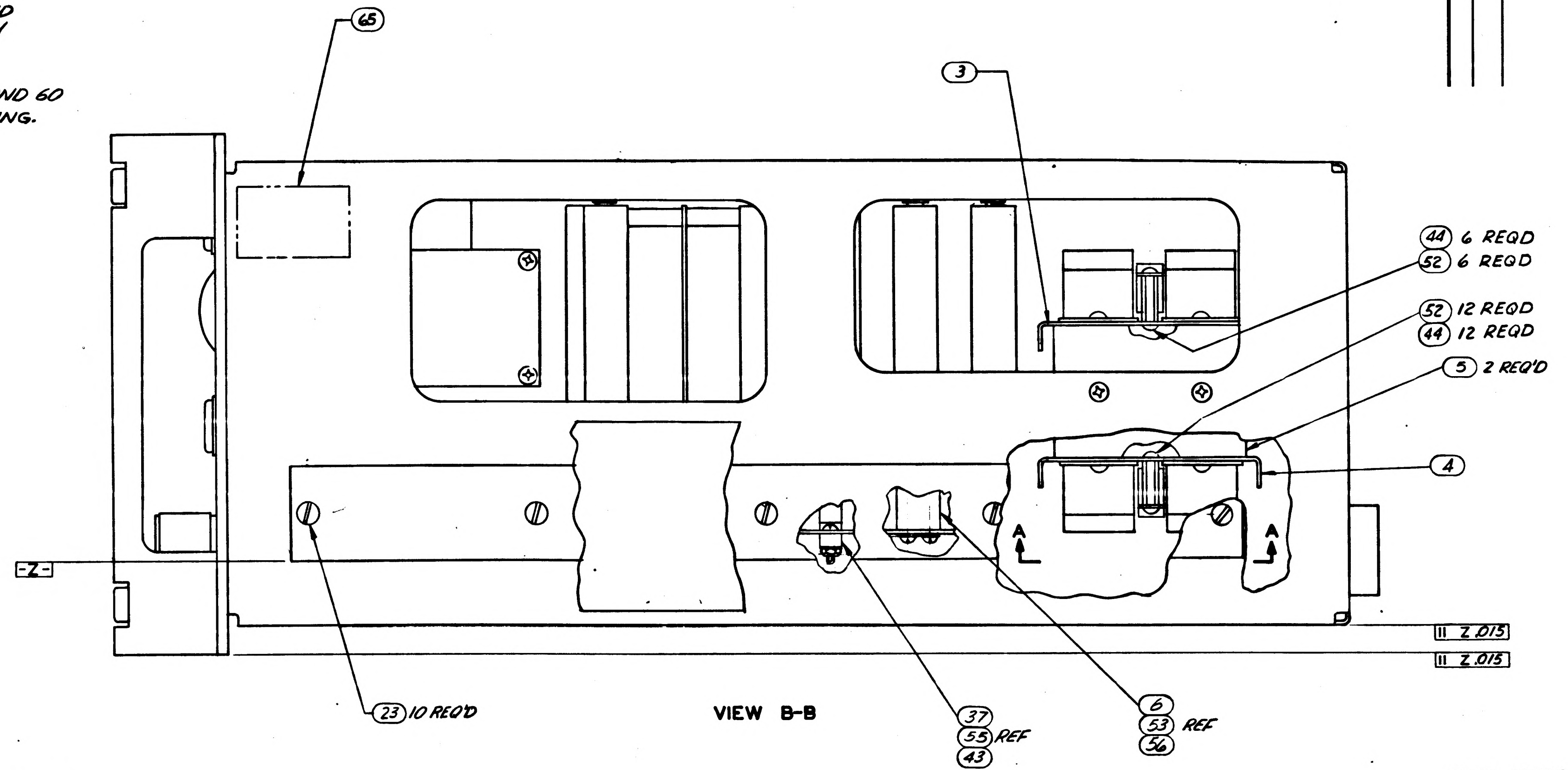
INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

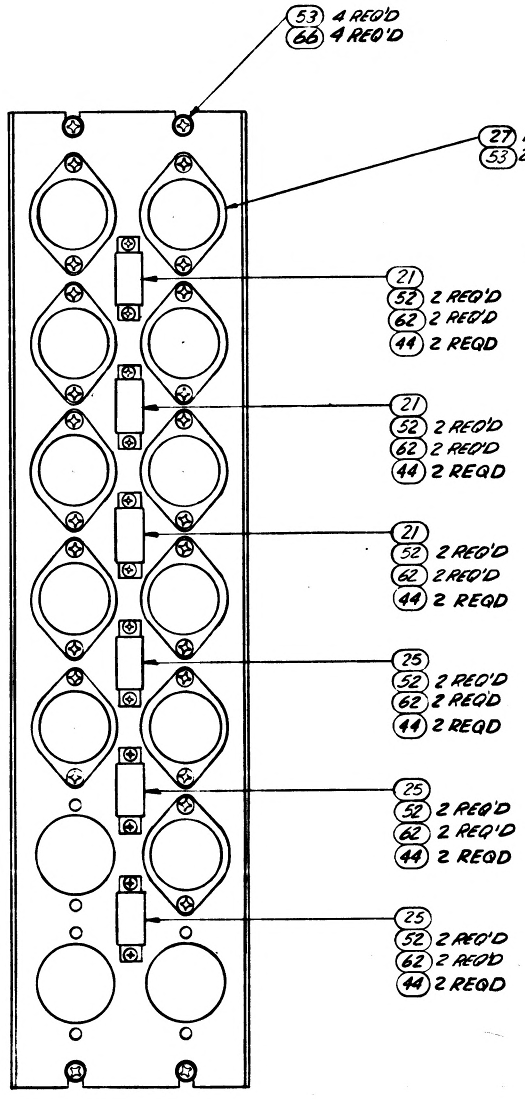
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010
3. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN ALL INSTALLATION
4. MARK WEIGHT OF ASSEMBLY PER ND1002123 ADJACENT TO NAMEPLATE LOCATION
5. SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEMS 59 AND 60
6. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPLACES REVISION "E" WITH CHANGE PER MXC 188220		30 JUL 63	
F		TDRR # 02574			



VIEW B-B



PARTIAL VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 DATE

F	F
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓕ REPLACES REV (E) WITH CHANGE

SEE NOTE 6 (items 33 through 18)

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1		33	1015873-008	FUSE-HOLDER
			3		32	1015869-717	SWITCH-LIGHT
			3		31	1015869-716	SWITCH-LIGHT
			1		30	1015869-715	SWITCH-LIGHT
			1		29	1015869-714	SWITCH-LIGHT
			1		28	1015869-713	SWITCH-LIGHT
			22		27	1015837-001	RELAY 6PDT
			3		26	1015833-009	RELAY TIME DELAY
			3		25	1015832-118	RELAY 2PDT
			8		24	1015831-257	SCREW-FL HD
			10		23	1015826-296	SCREW FLAT HD
			3		22	1015825-6	SWITCH-ROTARY
			6		21	1015802-001	RELAY 2PDT
			1		20	1015791-010	SLIDE ASSY L.H.
			1		19	1015791-009	SLIDE ASSY R.H.
			4		18	1006783-45	SCREW BUTTON HD
			1		17	1900339-011	PRECISION ALIGN SERVO AMPL ASSY
			1		16	1900337-011	PRECISION ALIGN SERVO AMPL ASSY
			1		15	1900326-011	PRECISION ALIGN SERVO AMPL ASSY
			2		14	1900323-011	COMPONENT BOARD ASSY
			3		13	1900320-011	PHASE SENSITIVE ERROR DET ASSY
			1		12	1900269-031	DUMP PROTECTION ASSY (OUTER)
			1		11	1900269-021	DUMP PROTECTION ASSY (MIDDLE)
			1		10	1900269-011	DUMP PROTECTION ASSY (INNER)
			3		9	1900300-011	GIMBAL POSITION DISPLAY ASSY
			2		8	1900015-051	HANDLE ASSY
			9		7	1900391	BRKT CIRCUIT BOARD DOUBLE
			10		6	1900390	BRKT CIRCUIT BOARD SINGLE
			2		5	1900389	BRKT SUPPORT RELAY (INSEP) ASSY
			1		4	1900388	BRKT RELAY-LOWER (INSEP) ASSY
			1		3	1900387	BRKT RELAY-UPPER (INSEP) ASSY
			1		2	1900386	FRONT PANEL
			1		1	1900385	CHASSIS (INSEP) ASSY

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			38		67	MS35216-27	SCREW PAN HD CROSS RECESS
			8		66	AN960C6L	WASHER-FLAT
			1		65		NAMEPLATE
			X		64		SCHEMATIC-ELECTRICAL
			1		63	1900185	WIRING HARNESS A
			18		62		SPACER
			1		61		WIRE LIST
			AR		60	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
			AR		59	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
			3		58	MS91528-2K2B	KNOB-POINTER
			2		57	MS90078-11-1	FUSE (2 AMP)
			38		56	MS35335-30	WASHER EXT TOOTH
			26		55	MS35216-28	SCREW PAN HD CROSS RECESS
			12		54	MS35216-25	SCREW PAN HD CROSS RECESS
			56		53	MS35216-24	SCREW PAN HD CROSS RECESS
			42		52	MS35216-13	SCREW PAN HD CROSS RECESS
			12		51	MS35200-42	SCREW FL HD CROSS RECESS
			6		50	MS35200-25	SCREW FL HD CROSS RECESS
			1		46	MS26572-1	FUSE HOLDER-SPARE
			36		44	MS35335-29	WASHER, EXT TOOTH
			38		43	AN363C632	NUT-SELF LOCKING
			4		42	AN363C1032	NUT-SELF LOCKING

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Jatieck DATE 1 JUL 63
CHECKED 9 Jul 63
APPROVAL McComas 10 Jul 63
APPROVAL 8/14/63
NASA APPROVAL 8-14-63
MIT APPROVAL 14 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

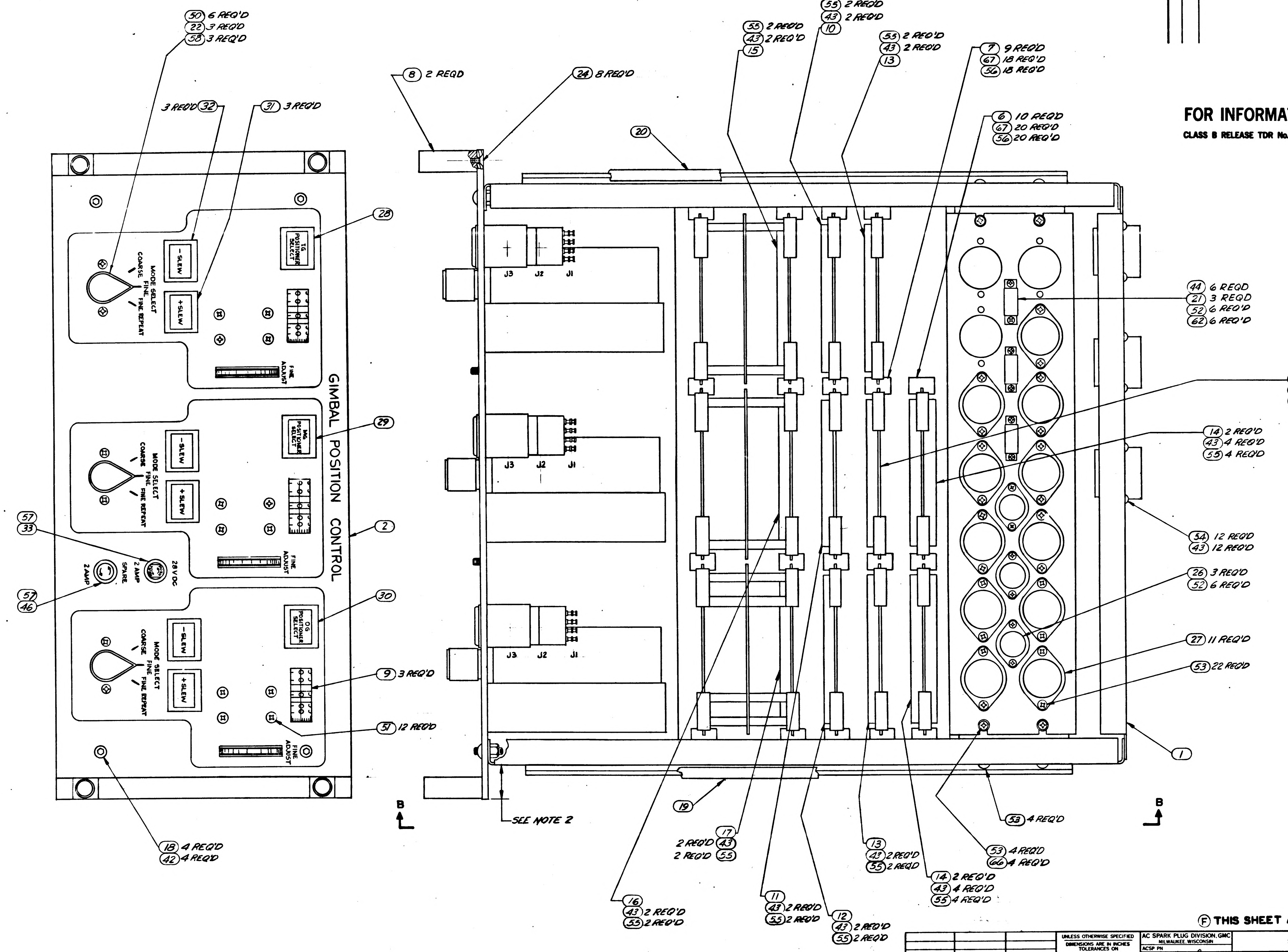
CONTROL GIMBAL POSITION DRAWER ASSEMBLY

CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		THIS SHEET ADDED PER MXC 188220		30 Jul 63	C.A.W.
F		TDRR 02574			

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0256 DATE



GIMBAL POSITION CONTROL
MODE SELECT
COARSE
FINE
FINE REPEAT
-SLEW
+SLEW
FINE ADJUST
IG POSITIONER SELECT
MG POSITIONER SELECT
OG POSITIONER SELECT
28V DC 2 AMP
SPARE 2 AMP
J3
J2
J1
B
SEE NOTE 2
50 6 REQ'D
22 3 REQ'D
58 3 REQ'D
3 REQ'D 32
31 3 REQ'D
8 2 REQD
24 8 REQ'D
20
55 2 REQ'D
43 2 REQ'D
15
55 2 REQ'D
43 2 REQ'D
10
55 2 REQ'D
43 2 REQ'D
13
7 9 REQ'D
67 18 REQ'D
56 18 REQ'D
6 10 REQ'D
67 20 REQ'D
56 20 REQ'D
28
29
2
30
57
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46
9 3 REQ'D
51 12 REQ'D
18 4 REQ'D
42 4 REQ'D
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21 3 REQD
52 6 REQ'D
62 6 REQ'D
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55 2 REQD
14 2 REQ'D
43 4 REQ'D
55 4 REQ'D
54 12 REQ'D
43 12 REQ'D
26 3 REQ'D
52 6 REQ'D
27 11 REQ'D
53 22 REQ'D
1
53 4 REQ'D
19
17
2 REQ'D 43
2 REQ'D 55
13
43 2 REQ'D
55 2 REQ'D
53 4 REQ'D
66 4 REQ'D
14 2 REQ'D
43 4 REQ'D
55 4 REQ'D
16
43 2 REQ'D
55 2 REQ'D
11
43 2 REQ'D
55 2 REQ'D
12
43 2 REQ'D
55 2 REQD

Ⓕ THIS SHEET ADDED

NEXT ASSY	USED ON	APPLICABLE DASH NO.	
APPLICATION			
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Fatiscel DATE Jul 63
CHECKED 9 Jul 63
LDT APPROVAL 10 Jul 63
APPROVAL 2/11/63
NASA APPROVAL 8-14-63
MIT APPROVAL 14 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL GIMBAL POSITION DRAWER ASSEMBLY

CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET 2 OF 2

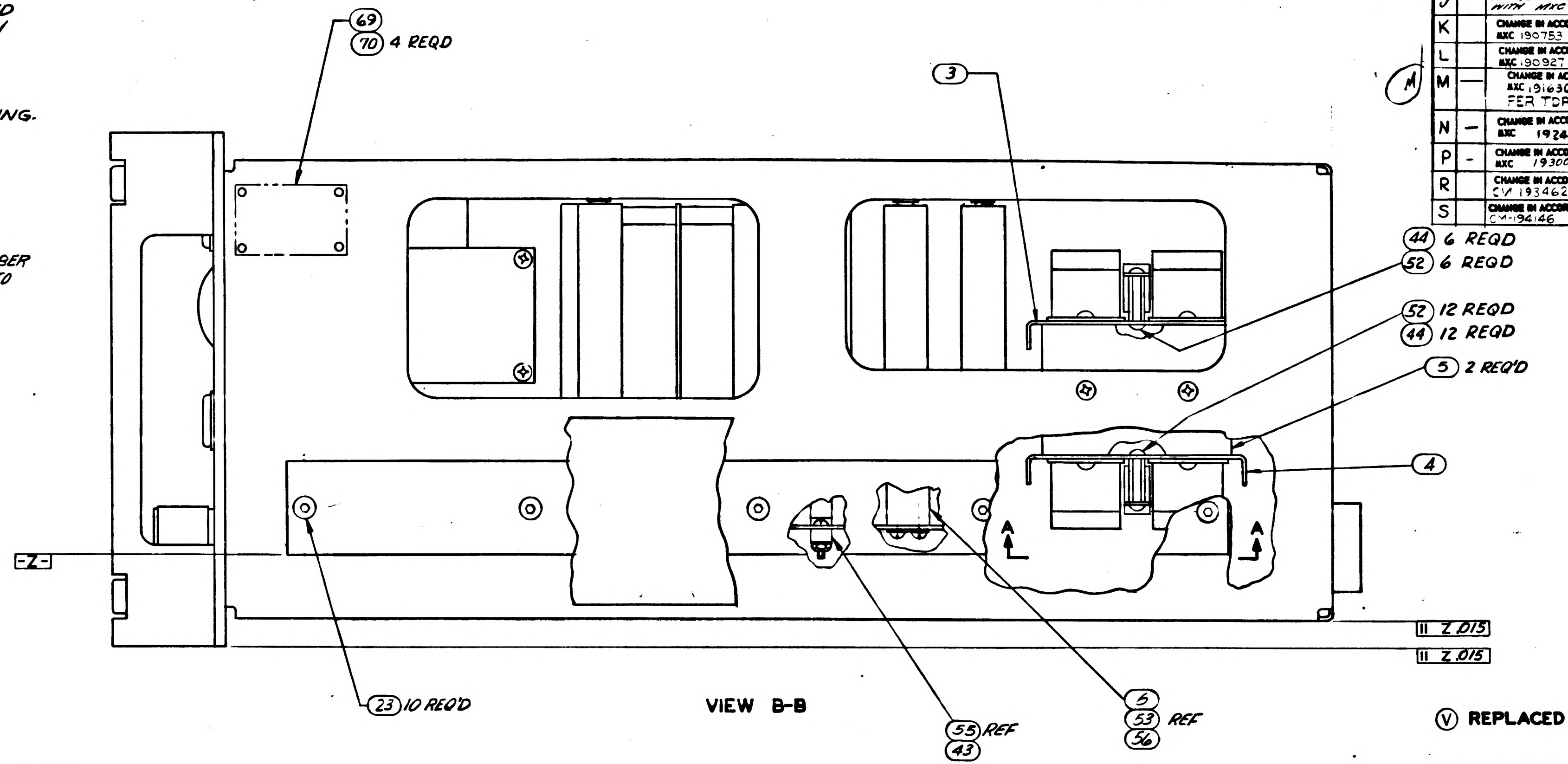
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
T		CHANGE IN ACCORDANCE WITH CM 194444		4 FEB 64	MEM
U		CHANGE IN ACCORDANCE WITH CM 194675		4 FEB	MEM
V		REPLACED WITH CHANGE BY REV. W PER CM 195190 REVISED PER TDR		26 MAR 64	

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		REPLACES REVISION "E" WITH CHANGE PER MXC 188220 REVISED PER TDRR 02574		30 JUL 63 14 AUG 63	CAM
G		CHANGED IN ACCORDANCE WITH MXC-190116		25-SEP-63	
H		CHANGED IN ACCORDANCE WITH MXC-190288		25-SEP-63	
J		CHANGED IN ACCORDANCE WITH MXC-190553		8 OCT 63	
K		CHANGE IN ACCORDANCE WITH MXC 190753		16 OCT 63	
L		CHANGE IN ACCORDANCE WITH MXC 190927		16 OCT 63	
M	—	CHANGE IN ACCORDANCE WITH MXC 191630 PER TDRR	—	30 OCT 63	
N	—	CHANGE IN ACCORDANCE WITH MXC 192464 PER TDRR 08967	—	14 JAN 64	RJF
P	-	CHANGE IN ACCORDANCE WITH MXC 193005 PER TDRR 08968	—	16 JAN 64	RJF
R		CHANGE IN ACCORDANCE WITH CM 193462 PER TDRR 08969	—	17 JAN 64	
S		CHANGE IN ACCORDANCE WITH CM-194146 PER TDRR 08970		24 JAN 64	

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010
3. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN ALL INSTALLATION
4. MARK WEIGHT OF ASSEMBLY PER ND1002123 ADJACENT TO NAMEPLATE LOCATION
5. SOLDER PER MIL-STD-440 USING ITEMS 59 AND 60
6. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
7.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO TO ITEM (69) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH
9. SECURE SCREWS USING ITEM (34).
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. SELECT ITEMS (71) AND (72) AS REQUIRED.

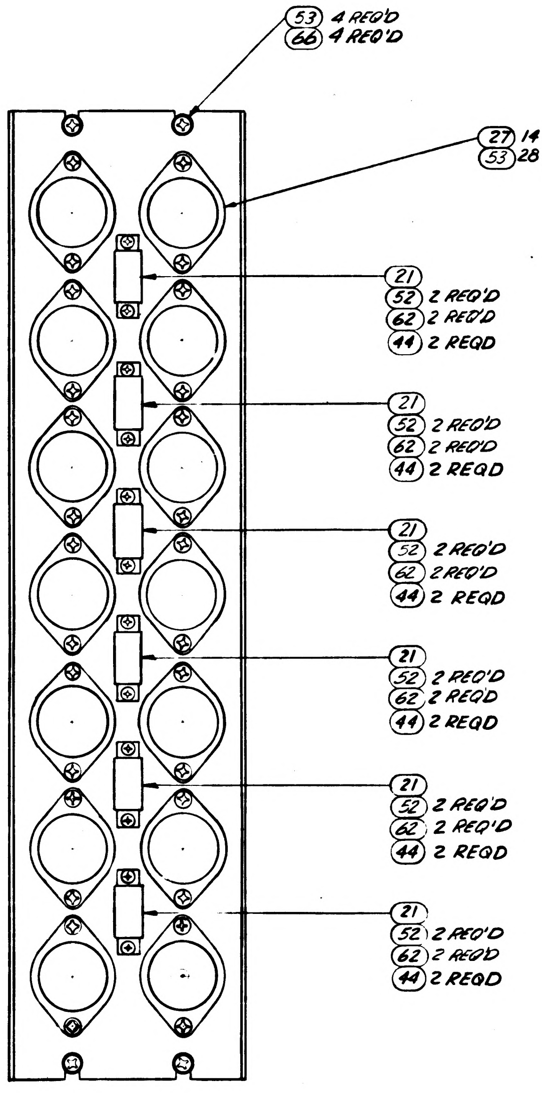


VIEW B-B

Ⓥ REPLACED WITH CHANGE BY REV W

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 DATE



PARTIAL VIEW A-A

SHEET 1	SHEET 2
U	S
T	S
S	S
R	R
P	N
M	M
L	J
K	J
J	J
H	—
G	G
F	F

REVISION STATUS OF SHEETS

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				2		75	AN363C832	(1896990-281) NUT, SELF LOCKING
				2		74	AN960C8	(1897006-008) WASHER, FLAT
				2		73	MS35216-41	SCREW, PAN HD, CROSS RECESS
SEE NOTE 11				1		72	MS21919-DG6 THRU DG8	(1897073-106 THRU 108) CLAMP CUSHIONED LOOP
SEE NOTE 11				1		71	MS21919-DG7 THRU DG9	(1897073-107 THRU 109) CLAMP CUSHIONED LOOP
				4		70	AN535-00-4	SCREW, DRIVE, ROUNDHEAD
				1		69	1901304-107	NAMEPLATE
				X		68	ATP 1900054	SPEC-ASSY TEST PROCEDURE
				38		67	MS35216-27	SCREW PAN HD CROSS RECESS
				8		66	AN960C6L	WASHER-FLAT (1897006-036)
				X		64	1900455	SCHEMATIC-ELECTRICAL
				1		63	1900185	WIRING HARNESS A
				18		62	1016000-014	SPACER
						61		
				AR		60	MIL-F-14256	FLUX (ES-2798)
							QQ-S-571	FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
				AR		59	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				3		58	MS91528-2K2B	KNOB-POINTER
				2		57	MS90078-15-1	FUSE (2 AMP) (1897077-115)
				38		56	MS35335-30	WASHER EXT TOOTH
				26		55	MS35216-28	SCREW PAN HD CROSS RECESS
				12		54	MS35216-25	SCREW PAN HD CROSS RECESS
				62		53	MS35216-24	SCREW PAN HD CROSS RECESS
				42		52	MS35216-13	SCREW PAN HD CROSS RECESS
				12		51	MS35200-42	SCREW FL HD CROSS RECESS
				6		50	MS35200-25	SCREW FL HD CROSS RECESS
				1		46	MS26572-1	FUSE HOLDER-SPARE
				36		44	MS35335-29	WASHER, EXT TOOTH
				38		43	AN363C632	NUT-SELF LOCKING (1896990-261)
				6		42	AN363C1032	NUT-SELF LOCKING (1896990-011)

LIST OF PARTS AND MATERIALS

Ⓕ REPLACES REV E WITH CHANGE

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				AR		34	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
SEE NOTE 6				1		33	1015873-008	FUSE-HOLDER
SEE NOTE 6				3		32	1015869-717	SWITCH-LIGHT
SEE NOTE 6				3		31	1015869-716	SWITCH-LIGHT
SEE NOTE 6				1		30	1015869-715	SWITCH-LIGHT
SEE NOTE 6				1		29	1015869-714	SWITCH-LIGHT
SEE NOTE 6				1		28	1015869-713	SWITCH-LIGHT
SEE NOTE 6				25		27	1015837-001	RELAY 6PDT
SEE NOTE 6				3		26	1015833-009	RELAY TIME DELAY
SEE NOTE 6				3		25	1015832-118	RELAY 2PDT
SEE NOTE 6				8		24	1015831-253	SCREW-FL HD
SEE NOTE 6				10		23	1015826 304	SCREW FLAT HD
SEE NOTE 6				3		22	1015825-7	SWITCH-ROTARY
SEE NOTE 6				6		21	1015802-001	RELAY 2PDT
SEE NOTE 6				1		20	1015791-010	SLIDE ASSY L.H.
SEE NOTE 6				1		19	1015791-009	SLIDE ASSY R.H.
SEE NOTE 6				6		18	1006783-45	SCREW BUTTON HD
				1		17	1900339-011	PRECISION ALIGN SERVO AMPL ASSY
				1		16	1900337-011	PRECISION ALIGN SERVO AMPL ASSY
				1		15	1900326-011	PRECISION ALIGN SERVO AMPL ASSY
				2		14	1900323-011	COMPONENT BOARD ASSY
				3		13	1900320-011	PHASE SENSITIVE ERROR DET ASSY
				1		12	1900269-031	DUMP PROTECTION ASSY (OUTER)
				1		11	1900269-021	DUMP PROTECTION ASSY (MIDDLE)
				1		10	1900269-011	DUMP PROTECTION ASSY (INNER)
				3		9	1900300-011	GIMBAL POSITION DISPLAY ASSY
				2		8	1900015-051	HANDLE ASSY
				9		7	1900391	BRKT CIRCUIT BOARD DOUBLE
				10		6	1900390	BRKT CIRCUIT BOARD SINGLE
				2		5	1900389	BRKT SUPPORT RELAY (INSEP) ASSY
				1		4	1900388	BRKT RELAY-LOWER (INSEP) ASSY
				1		3	1900387	BRKT RELAY-UPPER (INSEP) ASSY
				1		2	1900386	FRONT PANEL
				1		1	1900385	CHASSIS (INSEP) ASSY

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Yaticek DATE 1 JUL 63
CHECKED 9 Jul 63
APPROVAL McComas 10 Jul 63
APPROVAL
NASA APPROVAL 8-14-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL GIMBAL POSITION DRAWER ASSEMBLY

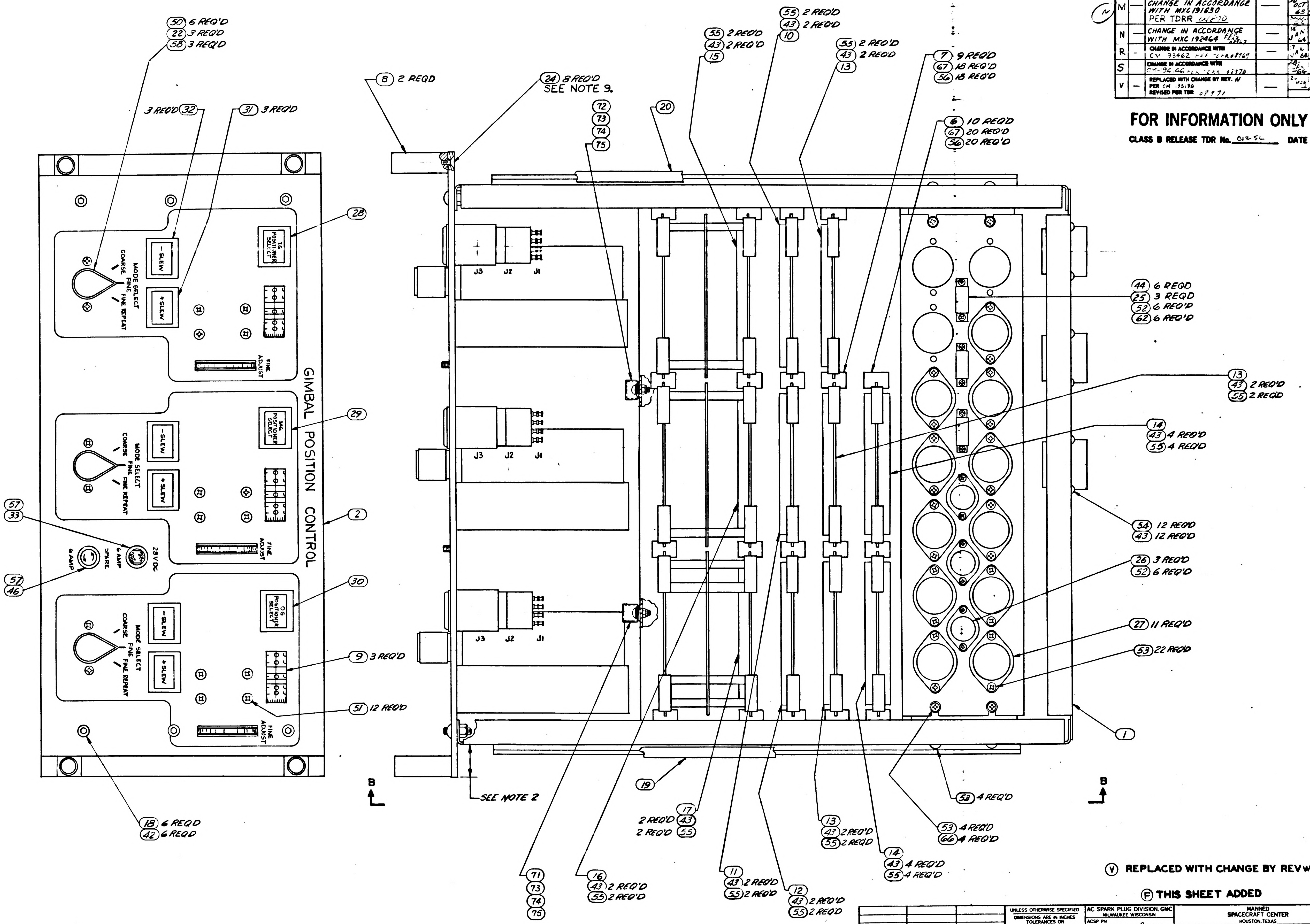
CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET 1 OF 2

V 1900054

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
F		THIS SHEET ADDED PER MXC 188220 REVISE PER TDRR 02574		30 JUL 63	C.A.M.
G		CHANGED IN ACCORDANCE WITH MXC-190116		25-SEP-63	
J		CHANGED IN ACCORDANCE WITH MXC-190553		8 OCT 63	
M	—	CHANGE IN ACCORDANCE WITH MXC 191630 PER TDRR 04870	—	30 OCT 63	EL
N	—	CHANGE IN ACCORDANCE WITH MXC 192464	—	14 JAN 64	RJF
R	-	CHANGE IN ACCORDANCE WITH CM 93462 PER TDRR 08969	—	17 JAN 64	
S		CHANGE IN ACCORDANCE WITH CM-94146 PER TDRR 08970		28-JAN-64	
V	—	REPLACED WITH CHANGE BY REV. W PER CM 195190 REVISED PER TDR 08971	—	2-MAR-64	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 **DATE**



GIMBAL POSITION CONTROL
MODE SELECT
COARSE
FINE
FINE REPEAT
-SLEW
+SLEW
IG POSITIONER SELECT
MG POSITIONER SELECT
OG POSITIONER SELECT
FINE ADJUST
28 V DC 6 AMP
SPARE 6 AMP
J3
J2
J1
(50) 6 REQ'D
(22) 3 REQ'D
(58) 3 REQ'D
3 REQ'D (32)
(31) 3 REQ'D
(28)
(29)
(30)
(2)
(57)
(33)
(57)
(46)
(9) 3 REQ'D
(51) 12 REQ'D
(18) 6 REQ'D
(42) 6 REQ'D
(8) 2 REQ'D
(24) 8 REQ'D SEE NOTE 9.
(72)
(73)
(74)
(75)
(20)
(55) 2 REQ'D
(43) 2 REQ'D
(15)
(55) 2 REQ'D
(43) 2 REQ'D
(10)
(55) 2 REQ'D
(43) 2 REQ'D
(13)
(7) 9 REQ'D
(67) 18 REQ'D
(56) 18 REQ'D
(6) 10 REQ'D
(67) 20 REQ'D
(56) 20 REQ'D
(44) 6 REQ'D
(25) 3 REQ'D
(52) 6 REQ'D
(62) 6 REQ'D
(13)
(43) 2 REQ'D
(55) 2 REQ'D
(14)
(43) 4 REQ'D
(55) 4 REQ'D
(54) 12 REQ'D
(43) 12 REQ'D
(26) 3 REQ'D
(52) 6 REQ'D
(27) 11 REQ'D
(53) 22 REQ'D
(1)
(53) 4 REQ'D
(53) 4 REQ'D
(66) 4 REQ'D
(19)
SEE NOTE 2
B
B
(17)
2 REQ'D (43)
2 REQ'D (55)
(13)
(43) 2 REQ'D
(55) 2 REQ'D
(14)
(43) 4 REQ'D
(55) 4 REQ'D
(71)
(73)
(74)
(75)
(16)
(43) 2 REQ'D
(55) 2 REQ'D
(11)
(43) 2 REQ'D
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(12)
(43) 2 REQ'D
(55) 2 REQ'D

Ⓥ **REPLACED WITH CHANGE BY REV W**

Ⓕ **THIS SHEET ADDED**

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Fitick DATE JUL 63
CHECKED 9 Jul 63
APPROVAL 10 Jul 63
APPROVAL 7/19/63
NASA APPROVAL 8-14-63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL GIMBAL POSITION DRAWER ASSEMBLY

CODE IDENT NO. | SIZE E | 1900054
SCALE FULL | SHEET 2 OF 2

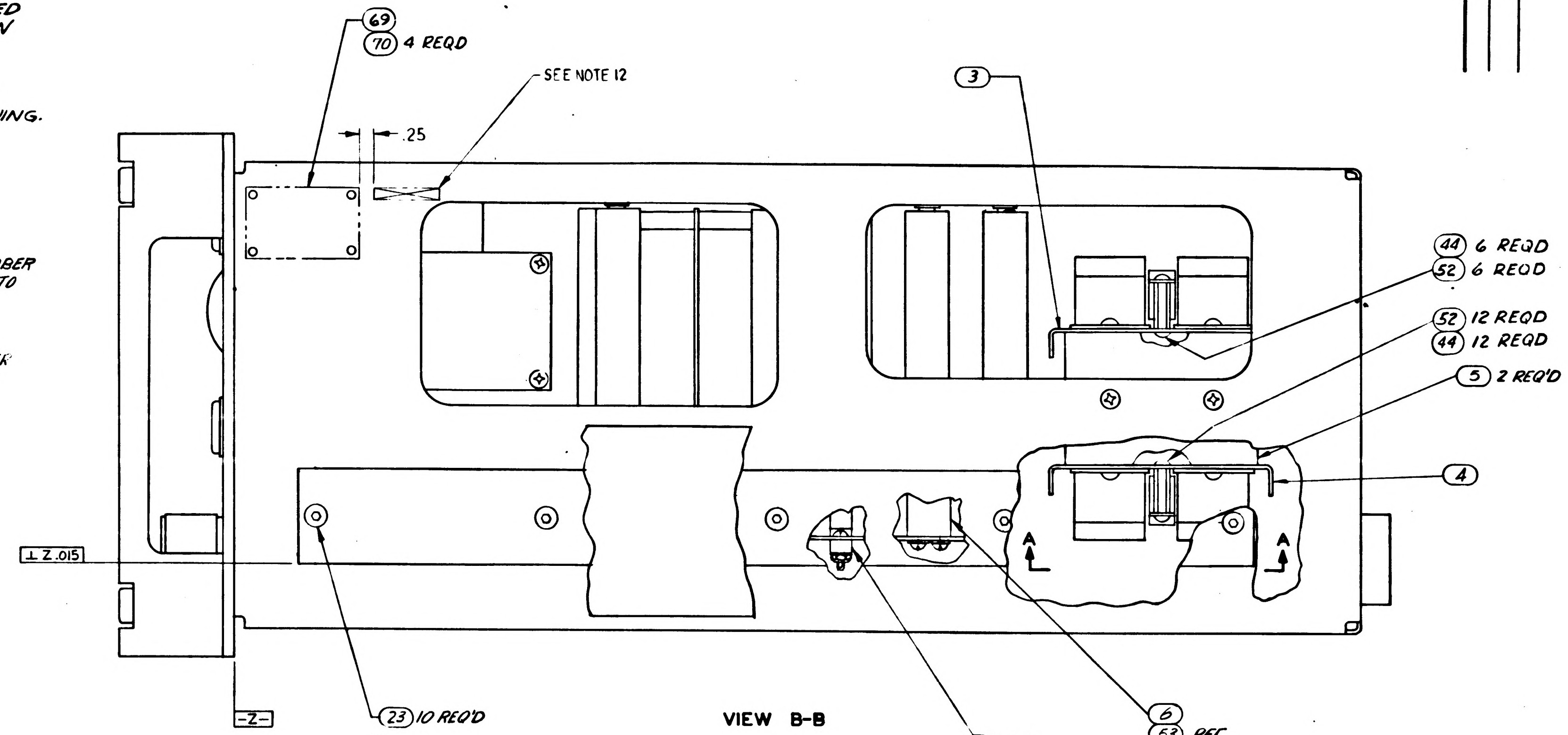
1900054

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
W		REPLACES REV. V WITH CHANGE PER CM 195 REVISED PER TDR 08371	—	[illegible]	WK
Y		CHANDE IN ACCORDANCE WITH CM 196025 PER TDRR 08972		8 APR [illegible]	MEM WK
Z		CHANGE IN ACCORDANCE WITH CM 196184 PER TDRR 08473		22 APR 64	RJW PF WK

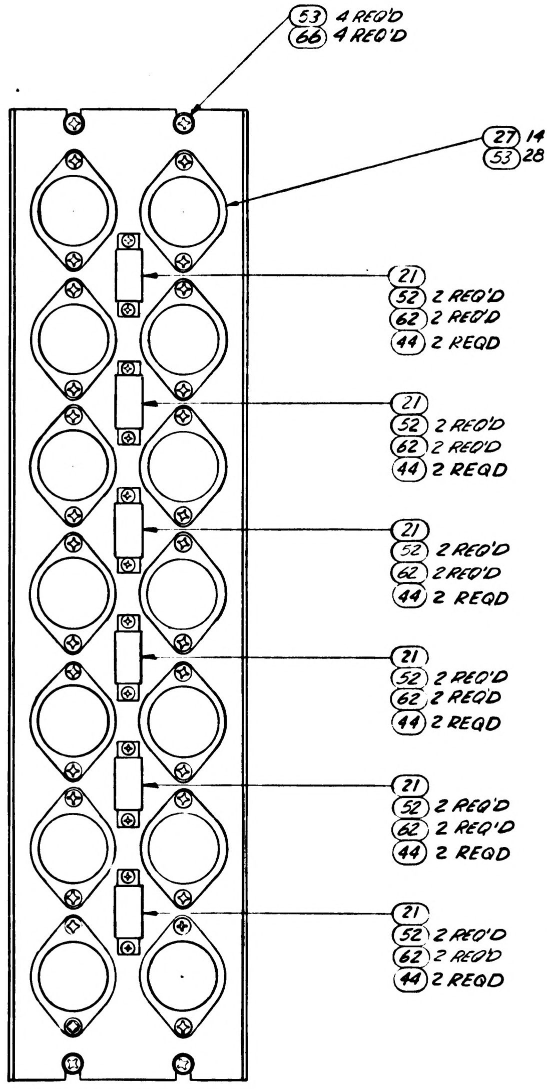
REVISIONS

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DIMENSIONS "A" AND "B" TO BE EQUAL WITHIN .040
3. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN ALL INSTALLATION
4. MARK WEIGHT OF ASSEMBLY (43 LBS) PER ND 1002123 ADJACENT TO NAMEPLATE LOCATION
5. SOLDER PER MIL-STD-440 USING ITEMS 59 AND 60
6. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.
7.
8. MARK APPLICABLE CONTRACT NO. AND SERIAL NO TO ITEM (69) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH
9. SECURE SCREWS USING ITEM (34).
10. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
11. SELECT ITEMS (71) AND (72) AS REQUIRED.
12. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.
13. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.



VIEW B-B



PARTIAL VIEW A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01256 DATE 13 MAY 63

(W) REPLACES REV V WITH CHANGE

SEE NOTE 6 & 13				AR		77	1016005-1	SHIM-LAMINATED
				╳		76	PS 1900054	PROCUREMENT SPECIFICATION
				2		75	AN363C832	(1896990-281) NUT, SELF LOCKING
				2		74	AN960C8	(1897006-008) WASHER, FLAT
				2		73	MS35216-41	SCREW, PAN HD, CROSS RECESS
SEE NOTE 11				1		72	MS21919-DG6 THRU DG8	(1897073-106 THRU 108) CLAMP CUSHIONED LOOP
SEE NOTE 11				1		71	MS21919-DG7 THRU DG9	(1897073-107 THRU 109) CLAMP CUSHIONED LOOP
				4		70	AN535-00-4	(1897109-004) SCREW, DRIVE, ROUND HEAD
				1		69	1901304-107	NAMEPLATE
				38		67	MS35216-27	SCREW PAN HD CROSS RECESS
				8		66	AN960C6L	WASHER-FLAT (1897006-036)
				╳		64	1900455	SCHEMATIC-ELECTRICAL
				1		63	1900185	WIRING HARNESS A
SEE NOTE 6				18		62	1016000-014	SPACER
						61		
				AR		60	MIL-F-14256	FLUX (ES-2798)
							QQ-S-571	FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
				AR		59	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				3		58	MS91528-2K2B	(197080-023) KNOB, POINTER
				2		57	MS90078-15-1	FUSE (2 AMP) (1897077-115)
				38		56	MS35335-30	WASHER EXT TOOTH
				26		55	MS35216-28	SCREW PAN HD CROSS RECESS
				12		54	MS35216-25	SCREW PAN HD CROSS RECESS
				62		53	MS35216-24	SCREW PAN HD CROSS RECESS
				42		52	MS35216-13	SCREW PAN HD CROSS RECESS
				12		51	MS35200-42	SCREW FL HD CROSS RECESS
				6		50	MS35200-25	SCREW FL HD CROSS RECESS
				1		46	MS26572-1	FUSE HOLDER-SPARE
				36		44	MS35335-29	WASHER, EXT TOOTH
				38		43	AN363C632	NUT-SELF LOCKING (1896990-261)
				6		42	AN363C1032	NUT-SELF LOCKING (1896990-011)
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

				AR		34	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
SEE NOTE 6				1		33	1015873-008	FUSE-HOLDER
SEE NOTE 6				3		32	1015869-717	SWITCH-LIGHT
SEE NOTE 6				3		31	1015869-716	SWITCH-LIGHT
SEE NOTE 6				1		30	1015869-715	SWITCH-LIGHT
SEE NOTE 6				1		29	1015869-714	SWITCH-LIGHT
SEE NOTE 6				1		28	1015869-713	SWITCH-LIGHT
SEE NOTE 6				25		27	1015837-001	RELAY 6 PDT
SEE NOTE 6				3		26	1015833-009	RELAY TIME DELAY
SEE NOTE 6				3		25	1015832-118	RELAY 2PDT
SEE NOTE 6				8		24	1015831-253	SCREW-FL HD
SEE NOTE 6				10		23	1015826 304	SCREW FLAT HD
SEE NOTE 6				3		22	1015825-7	SWITCH-ROTARY
SEE NOTE 6				6		21	1015802-001	RELAY 2PDT
SEE NOTE 6				1		20	1015791-010	SLIDE ASSY L.H.
SEE NOTE 6				1		19	1015791-009	SLIDE ASSY R.H.
SEE NOTE 6				6		18	1006783-45	SCREW BUTTON HD
				1		17	1900339-011	PRECISION ALIGN SERVO AMPL ASSY
				1		16	1900337-011	PRECISION ALIGN SERVO AMPL ASSY
				1		15	1900326-011	PRECISION ALIGN SERVO AMPL ASSY
				2		14	1900323-011	COMPONENT BOARD ASSY
				3		13	1900320-011	PHASE SENSITIVE ERROR DET ASSY
				1.		12	1900269-031	DUMP PROTECTION ASSY (OUTER)
				1		11	1900269-021	DUMP PROTECTION ASSY (MIDDLE)
				1		10	1900269-011	DUMP PROTECTION ASSY (INNER)
				3		9	1900300-011	GIMBAL POSITION DISPLAY ASSY
				2		8	1900015-051	HANDLE ASSY
				9		7	1900391	BRKT CIRCUIT BOARD DOUBLE
				10		6	1900390	BRKT CIRCUIT BOARD SINGLE
				2		5	1900389	BRKT SUPPORT RELAY (INSEP) ASSY
				1		4	1900388	BRKT RELAY-LOWER (INSEP) ASSY
				1		3	1900387	BRKT RELAY-UPPER (INSEP) ASSY
				1		2	1900386	FRONT PANEL
				1		1	1900385	CHASSIS (INSEP) ASSY
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

Z	Z
Y	Y
W	N
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ .020	+ —
− —	− .020	− —

DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Yatick DATE 1 JUL 63
CHECKED 9 Jul 63
APPROVAL McComas 10 Jul 63
APPROVAL
NASA APPROVAL 5-26-
KIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

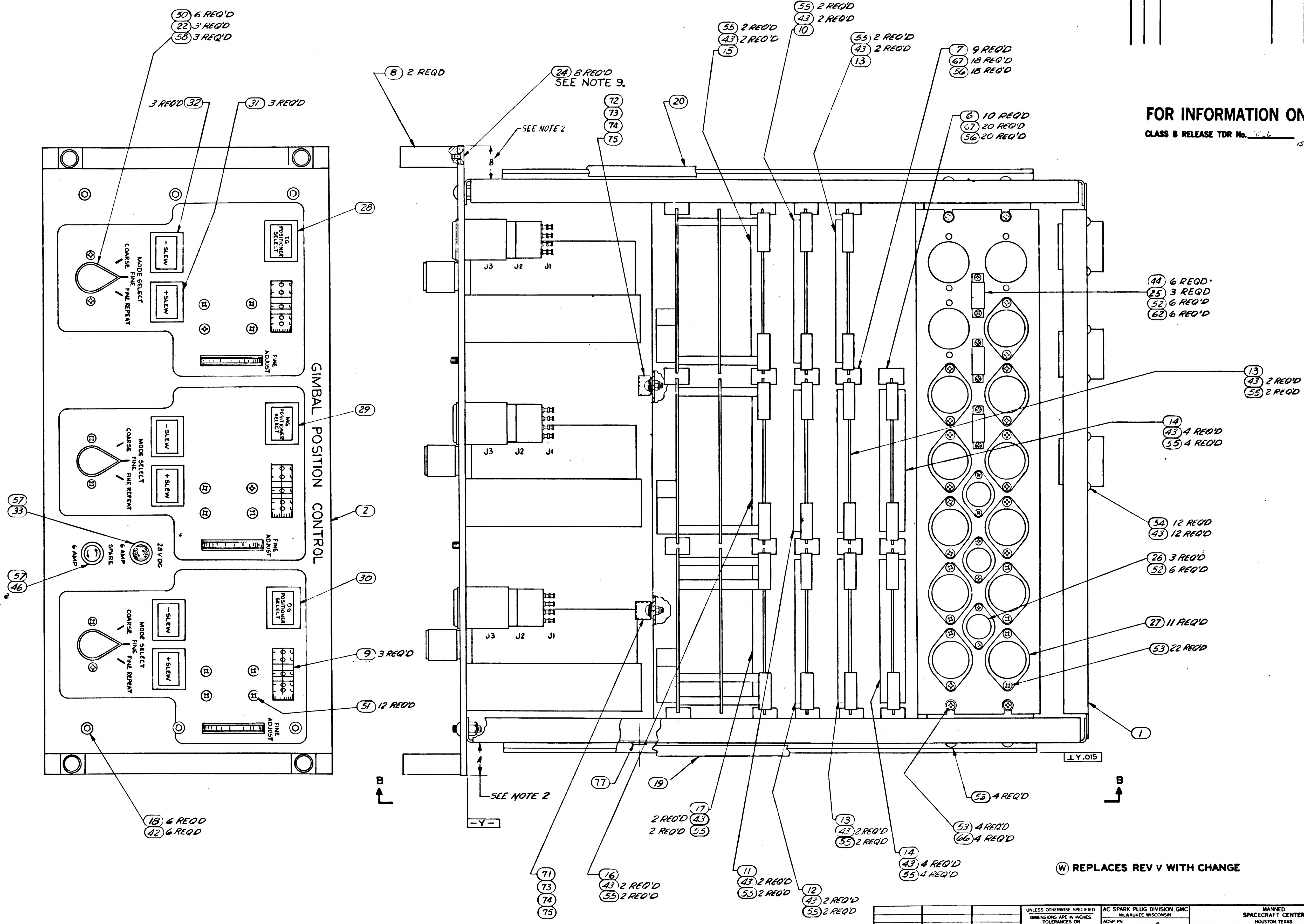
CONTROL GIMBAL POSITION DRAWER ASSEMBLY

CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET 1 OF 2

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
N		REPLACES REV. V WITH CHANGE PER CM 195120 REVISED PER TDR 04971		26 MAR 64 3-26-64	K. WR
Y		CHANGED IN ACCORDANCE WITH CM 196025 PER TDRR 08472		APR 64 5-26-64	
Z	-	CHANGE IN ACCORDANCE WITH CM 196184 PER TDRR 08473		22 APR 64 5-26-64	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. DATE 15 MAY 63



GIMBAL POSITION CONTROL
50 6 REQ'D
22 3 REQ'D
58 3 REQ'D
3 REQ'D 32
31 3 REQ'D
8 2 REQD
24 8 REQ'D SEE NOTE 9.
SEE NOTE 2
72
73
74
75
20
55 2 REQ'D
43 2 REQ'D
15
55 2 REQ'D
43 2 REQ'D
10
55 2 REQ'D
43 2 REQ'D
13
7 9 REQ'D
67 18 REQ'D
56 18 REQ'D
6 10 REQ'D
67 20 REQ'D
56 20 REQ'D
28
29
30
2
57
33
57
46
9 3 REQ'D
51 12 REQ'D
18 6 REQ'D
42 6 REQ'D
TG POSITIONER SELECT
MG POSITIONER SELECT
OG POSITIONER SELECT
MODE SELECT
COARSE
FINE
FINE REPEAT
-SLEW
+SLEW
FINE ADJUST
28 V DC
6 AMP
SPARE
6 AMP
J3
J2
J1
44 6 REQD
25 3 REQD
52 6 REQ'D
62 6 REQ'D
13
43 2 REQ'D
55 2 REQ'D
14
43 4 REQ'D
55 4 REQ'D
54 12 REQ'D
43 12 REQ'D
26 3 REQ'D
52 6 REQ'D
27 11 REQ'D
53 22 REQ'D
1
⊥Y.015
B
B
-Y-
SEE NOTE 2
77
19
53 4 REQ'D
53 4 REQ'D
66 4 REQ'D
17
2 REQ'D 43
2 REQ'D 55
13
43 2 REQ'D
55 2 REQ'D
14
43 4 REQ'D
55 4 REQ'D
71
73
74
75
16
43 2 REQ'D
55 2 REQ'D
11
43 2 REQ'D
55 2 REQ'D
12
43 2 REQ'D
55 2 REQ'D

Ⓦ REPLACES REV V WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

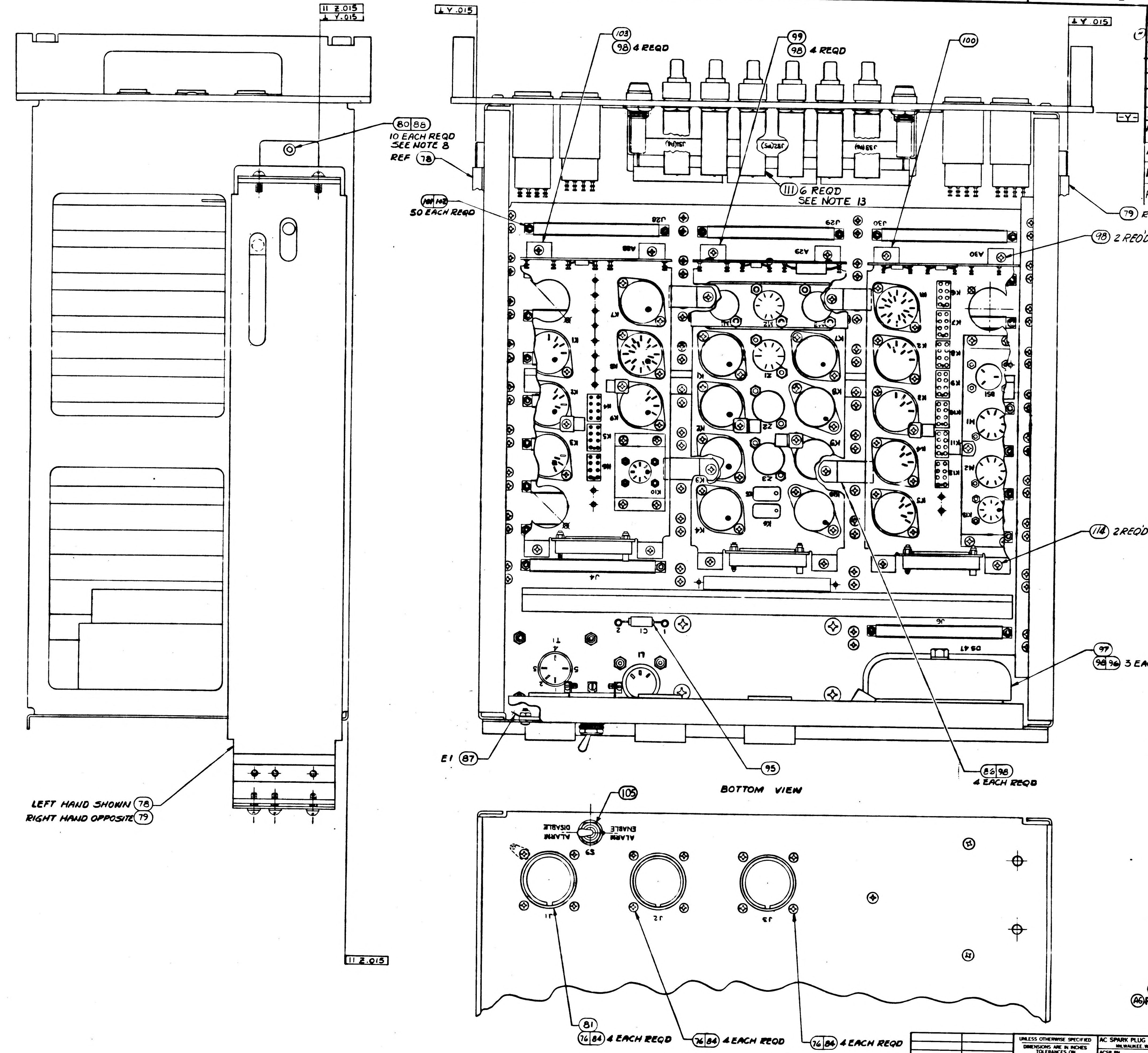
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN R. Fetical DATE 4 JUL 63
CHECKED 9 Jul 63
APPROVAL 10 Jul 63
APPROVAL 26 May 64
NASA APPROVAL 5-26-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

CONTROL GIMBAL POSITION
DRAWER ASSEMBLY

CODE IDENT NO.
SIZE E
1900054
SCALE FULL
SHEET 2 OF 2

1900054 Z


11 Z.015
⊥ Y.015
⊥ Y.015
⊥ Y.015
-Y-
103
98 4 REQD
99
98 4 REQD
100
80 88
10 EACH REQD
SEE NOTE 8
REF 78
111 6 REQD
SEE NOTE 13
79 REF
50 EACH REQD
98 2 REQ'D
114 2 REQ'D
97
98 96 3 EACH REQD
E1 87
95
86 98
4 EACH REQD
BOTTOM VIEW
LEFT HAND SHOWN 78
RIGHT HAND OPPOSITE 79
11 Z.015
105
ALARM ENABLE
ALARM DISABLE
81
76 84 4 EACH REQD
76 84 4 EACH REQD
76 84 4 EACH REQD

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
J		REPLACES REV H WITH CHANGE PER MXC 90239 REVISED PER TDR 04714		7 NOV 63	JEL
L	–	CHANGE IN ACCORDANCE WITH MXC-190652	–	27 DEC 63	M.G.
N	–	CHANGE IN ACCORDANCE WITH MXC-191379		3 JAN 64	M.G.
S		CHANGE IN ACCORDANCE WITH MXC-192369		22 JAN 64	M.G.
V		CHANGE IN ACCORDANCE WITH CM192911		3 FEB 64	MG
W		CHANGE IN ACCORDANCE WITH CM-193213		3 FEB 64	MG
AA		CHANGE IN ACCORDANCE WITH [illegible] 9395 REVISED PER TDR 01260		13 FEB 64	
AE	–	CHANGE IN ACCORDANCE WITH CM 95600 REV PER TDRR 01264	–	10 MAR 64	JM
AF		CHANGE IN ACCORDANCE WITH CM 96040 REV PER TDRR 01265		30 MAR 64	KW
AG		REPLACED WITH CHANGE BY REV AH TDR CV 9685 REVISED PER TDR 01266		APR 64	JWP

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

Ⓙ REPLACES REV "H" WITH CHANGE

(AG) REPLACED WITH CHANGE BY REV "AH"

THIS SHEET ADDED

1900004-011	1900004-011
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 4 SEPT 63
CHECKED W. Diehl 11 Sep '63
APPROVAL 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900055
SCALE FULL
SHEET 2 OF 3

1900055 AG

1900055
SH 2

NOTES:

1: INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2: MARK WEIGHT OF ASSEMBLY, (67 LBS), PER ND1002123 ADJACENT TO NAMEPLATE LOCATION.

3: CHASSIS SLIDE MOUNTING SCREWS, ITEM (80) AND FRONT PANEL MOUNTING SCREWS, ITEM (48) SHALL BE SUBJECTED TO TORQUE OF 37-40 IN.LB AT INSTALLATION.

4: DIMENSION A MUST BE EQUAL TO DIMENSION B WITHIN .040.

5: VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

6: SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEMS (89) & (90).

7:

8: SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

9: MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

10: SELECT AS REQUIRED.

11: APPLY WARNING PLATE ITEM (108) TO AREA INDICATED USING SOLVENT ACTIVATOR METHYLETHYL KETONE OR EQUIVALENT. CENTRALIZE AS SHOWN.

12: MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM (85) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH

13. SPOT TIE AS REQUIRED USING ITEM (112).

14. BEND TERMINAL NO. 2 ON THE FUSE HOLDER (ITEM (53)) 90° AWAY FROM THE BODY OF THE FUSE.

15. SECURE SCREWS USING ITEM (113).

16. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
-G		REPLACED WITH CHANGE BY REV AH PER [illegible] REVISED PER TDR 08266		16 APR 6-	JWF

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
J		REPLACES REV. H WITH CHANGE PER MXC 90239 REVISED PER TDR 04214		7-NOV-63	
K		CHANGED IN ACCORDANCE WITH MXC 190650		10 DEC 63	
L		CHANGE IN ACCORDANCE WITH MXC-190652 REVISION STATUS CHANGED		27-DEC 63	M.G.
M		CHANGE IN ACCORDANCE WITH MXC-190927 REVISION STATUS CHANGED		30-DEC 63	M.G.
N		CHANGE IN ACCORDANCE WITH MXC-191379 REVISION STATUS CHANGED		3-JAN 64	M.G.
P		CHANGE IN ACCORDANCE WITH MXC-191408 REVISION STATUS CHANGED REV PER TDRR 08254		6-JAN 64	M.G.
R		CHANGE IN ACCORDANCE WITH MXC-191976 REVISION STATUS CHANGED	REV PER TDRR 08255	21 JAN -64	M.G.
S		CHANGE IN ACCORDANCE WITH MXC-192369 REVISION STATUS CHANGED	REV PER TDRR 08256	22-JAN 64	M G
T		CHANGE IN ACCORDANCE WITH MXC-192539 REVISION STATUS CHANGED		29-JAN 64	M.G.
U		CHANGE IN ACCORDANCE WITH CM-192773 REVISION STATUS CHANGED	REV PER TDRR 08257	31-JAN -64	M G
V		CHANGE IN ACCORDANCE WITH CM-192911 REVISION STATUS CHANGED	REV PER TDRR 08258	31-JAN 64	M G
W		CHANGE IN ACCORDANCE WITH CM-193213 REVISION STATUS CHANGED		3-FEB -64	M G
Y		CHANGE IN ACCORDANCE WITH CM-193501 REVISION STATUS CHANGED		5-FEB 64	M.G
Z		CHANGE IN ACCORDANCE WITH CM-193806 REVISION STATUS CHANGED	REV PER TDRR 08259	6-FEB -64	M.G.
AA		CHANGE IN ACCORDANCE WITH CM-193931 REV PER TDRR 08260		7-FEB 64	
AB		CHANGE IN ACCORDANCE WITH CM-194123 REV PER TDRR 08261		14-FEB -64	
AC		CHANGE IN ACCORDANCE WITH CM-194147 REVISED PER TDR 08262		14-FEB -64	
AD		CHANGE IN ACCORDANCE WITH CM-195166 REVISED CUSTOMER DATA (2-64) REV PER TDRR 08263		25-FEB-64	
AE	-	CHANGE IN ACCORDANCE WITH CM-195600 REV PER TDRR 08264	-	16 MAR 64	JM
AF		CHANGE IN ACCORDANCE WITH CM 196040 REV PER TDRR 08265		30 MAR 64	

(J) REPLACES REV "H" WITH CHANGE

(AG) REPLACED WITH CHANGE BY REV AH

SHEET 1	SHEET 2	SHEET 3
AG	AG	AG
AF	AF	AF
AE	AE	AD
AD	AA	AD
AC	AA	AC
AB	AA	AA
AA	AA	AA
Z	W	W
Y	W	W
W	W	W
V	V	S
U	S	S
T	S	S
S	S	S
R	N	R

REVISION STATUS OF SHEETS

SHEET 1	SHEET 2	SHEET 3
P	N	P
N	N	M
M	L	M
L	L	L
K	J	J

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		114	MS-35216-40	SCREW MACHINE PAN HD.
	AR		113	MIL-S-40083-CL30	SEALING COMPOUND (ES-2544-5)
	AR		112	MIL-T-713	LACING TAPE TYPE P, CLASS 2 BLACK (ES-2735 NO. 18)
SEE NOTE 5.	6		111	1015864-424	INSULATION, SLEEVING, ELEC.
	X		110	1900865	SCHEMATIC DIAGRAM, ELECTRICAL

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	X		109	ATP1900055	ASSEMBLY TEST PROCEDURE
	1		108	1900617	WARNING PLATE, SELF BONDING
			107		
			106		
	1		105	MS35059-23	SWITCH - TOGGLE
	4		104	AN535-00-4	SCREW, DRIVE, ROUND HEAD
	1		103	1900783-011	RELAY BRACKET ASSEMBLY, A28
SEE NOTE 5	50		102	1016151-004	NUT- SELF LOCKING
	50		101	MS-35216-16	SCREW, MACHINE, PAN HD
	1		100	1900780-011	RELAY BRACKET ASSEMBLY, A30
	1		99	1900792-011	RELAY BRACKET ASSEMBLY, A29
	18		98	MS-35216-42	SCREW, MACHINE, PAN HD
	1		97	1901570-011	BELL, ELECTRICAL (24 VDC)
	3		96	AN363CB32 (1896990-281)	NUT, SELF LOCKING
	1		95	CS13AG180K (1896954-181)	CAPACITOR MIL-C-26655/2
	1		94	MS21919DG-2	CLAMP, CUSHIONED, SUPPORT
	18		93	1900391	BRACKET HOLDER, DOUBLE
	20		92	1900390	BRACKET HOLDER, SINGLE
	1		91	1900558	DRAWER, MONITOR PANEL (INSEP)
	AR		90	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		89	MIL-F-14256 QQ-S-571	FLUX (ES-2798) TYPE AR (ES-2175)
SEE NOTE 5	10		88	1016005-1	SHIM, SLIDE LOCATING
	1		87	MS35431-3	TERMINAL LUG
SEE NOTE 10	4 EA		86	MS21919-DG11 THRU 15	CLAMP, CUSHIONED, SUPPORT
	1		85	1901304-101	NAMEPLATE
	12		84	MS-35216-26	SCREW, MACHINE, PAN HD
			83		
	1		82	1900852	WIRING HARNESS B
	1		81	1900196	WIRING HARNESS A
SEE NOTE 5	10		80	1015826-304	SCREW, FLAT HEAD, HEX SOCKET
SEE NOTE 5	1		79	1015791-009	SLIDE ASSY, QUICK RELEASE, R.H.
SEE NOTE 5	1		78	1015791-010	SLIDE ASSY, QUICK RELEASE, L.H.
SEE NOTE 5	1		77	1016104	TRANSFORMER
	20		76	AN363C632 (1896990-261)	NUT, SELF LOCKING
SEE NOTE 5	1		75	1016085	REACTOR
	4		74	MS-35217-69	SCREW, PAN HD
	4		73	AN363C428 (1896990-041)	NUT, SELF LOCKING
SEE NOTE 5	1		72	1015944-001	BATTERY, STORAGE-24 VOLT
	1		71	1900447-011	3200 CPS FREQUENCY COMPARATOR
	76		70	MS35333-71	WASHER, LOCK, FLAT, INTERNAL TOOTH
	1		69	1900492-011	PILOT POWER SUPPLY, ±28 V DC
	1		68	1900487-011	VOLTAGE COMPARATOR, 2 VOLT, 3200 CPS
	1		67	1900707-011	VERIFICATION ASSEMBLY
	1		66	1900613-011	ENCODER ZEROING & -28VDC SENSOR
	2		65	1900370-011	WHEEL POWER & CDU MOTOR EXCITATION FAILURE SENSOR
			64		
	3		63	1900376-011	IG, MG OR OG SERVO ERROR SENSOR
	2		62	MS-90078-15-1 (1897077-115)	FUSE
	3		61	1900374-011	IMU, ACCEL OR CDU FAIL SENSOR
	3		60	1900372-011	PIPA SENSOR
	1		59	1900419-011	ENCODER EXCITATION FAILURE SENSOR ASSEMBLY
	3		58	1900373-011	IG, MG OR OG CDU ERROR SENSOR
	1		57	1900378-011	AGC SPARE, AGC POWER FAIL, ERROR DETECT & IMU DELAY SENSOR
	1		56	1900375-011	IMU TEMP. FAIL, MASTER WARNING & MASTER ALARM SENSOR
	78		55	MS-35216-27	SCREW, MACHINE, PAN HD
	1		54	1900793	BRACKET-CONNECTOR (INSEP) ASSY
SEE NOTE 5	4		53	1015873-001	FUSEHOLDER - INDICATING
	2		52	MS-26572-1	FUSEHOLDER
SEE NOTE 5	2		51	1015873-008	FUSEHOLDER - INDICATING
	6		50	MS-90078-12-1 (1897077-112)	FUSE
	6		49	AN363C1032 (1896990-011)	NUT, SELF LOCKING
SEE NOTE 5	6		48	1006783-45	SCREW, BUTTON HD, HEX SOCK
	1		47	1015869-339	LIGHT-INDICATOR & SWITCH ASSY
	1		46	1015869-520	LIGHT INDICATOR & SWITCH ASSY
	1		45	1015869-147	LIGHT-INDICATOR & SWITCH ASSY
	1		44	1015869-725	LIGHT-INDICATOR & SWITCH ASSY
	8		43	1015869-151	LIGHT-INDICATOR & SWITCH ASSY
	1		42	1015869-150	LIGHT-INDICATOR & SWITCH ASSY
	1		41	1015869-129	LIGHT-INDICATOR & SWITCH ASSY
	1		40	1015869-128	LIGHT-INDICATOR & SWITCH ASSY
	1		39	1015869-127	LIGHT-INDICATOR & SWITCH ASSY
	1		38	1015869-126	LIGHT-INDICATOR & SWITCH ASSY
	1		37	1015869-340	LIGHT INDICATOR & SWITCH ASSY
	1		36	1015869-342	LIGHT INDICATOR & SWITCH ASSY

LIST OF MATERIALS OR PARTS LIST

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		35	1015869-344	LIGHT INDICATOR & SWITCH ASSY
	1		34	1015869-158	LIGHT INDICATOR & SWITCH ASSY
	1		33	1015869-343	LIGHT INDICATOR & SWITCH ASSY
	1		32	1015869-125	LIGHT INDICATOR & SWITCH ASSY
	1		31	1015869-124	LIGHT INDICATOR & SWITCH ASSY
	1		30	1015869-123	LIGHT INDICATOR & SWITCH ASSY
	1		29	1015869-122	LIGHT INDICATOR & SWITCH ASSY
	1		28	1015869-121	LIGHT INDICATOR & SWITCH ASSY
	1		27	1015869-149	LIGHT INDICATOR & SWITCH ASSY
	1		26	1015869-146	LIGHT INDICATOR & SWITCH ASSY
	1		25	1015869-145	LIGHT INDICATOR & SWITCH ASSY
			24		
			23		
			22		
	1		21	1015869-119	LIGHT INDICATOR & SWITCH ASSY
	1		20	1015869-118	LIGHT INDICATOR & SWITCH ASSY
	1		19	1015869-117	LIGHT INDICATOR & SWITCH ASSY
	1		18	1015869-120	LIGHT INDICATOR & SWITCH ASSY
	1		17	1015869-116	LIGHT INDICATOR & SWITCH ASSY
	1		16	1015869-115	LIGHT INDICATOR & SWITCH ASSY
	1		15	1015869-141	LIGHT INDICATOR & SWITCH ASSY
	1		14	1015869-140	LIGHT INDICATOR & SWITCH ASSY
	1		13	1015869-139	LIGHT INDICATOR & SWITCH ASSY
	1		12	1015869-138	LIGHT INDICATOR & SWITCH ASSY
	1		11	1015869-137	LIGHT INDICATOR & SWITCH ASSY
	1		10	1015869-136	LIGHT INDICATOR & SWITCH ASSY
			9		
			8		
	1		7	1015869-112	LIGHT INDICATOR & SWITCH ASSY
	1		6	1015869-111	LIGHT INDICATOR & SWITCH ASSY
	1		5	1015869-110	LIGHT INDICATOR & SWITCH ASSY
	1		4	1015869-109	LIGHT INDICATOR & SWITCH ASSY
SEE NOTE 5	8		3	1015831-253	SCREW, FLAT HD 100° (HEX SOCKET)
	2		2	1900015-061	HANDLE ASSEMBLY
	1		1	1900499	PANEL, FRONT

1900055 AG

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

NEXT ASSY	USED ON	APPLICABLE DASH NO.
~~1900004-011~~	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 4 SEPT 63
CHECKED 11 SEP 63
APPROVAL 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

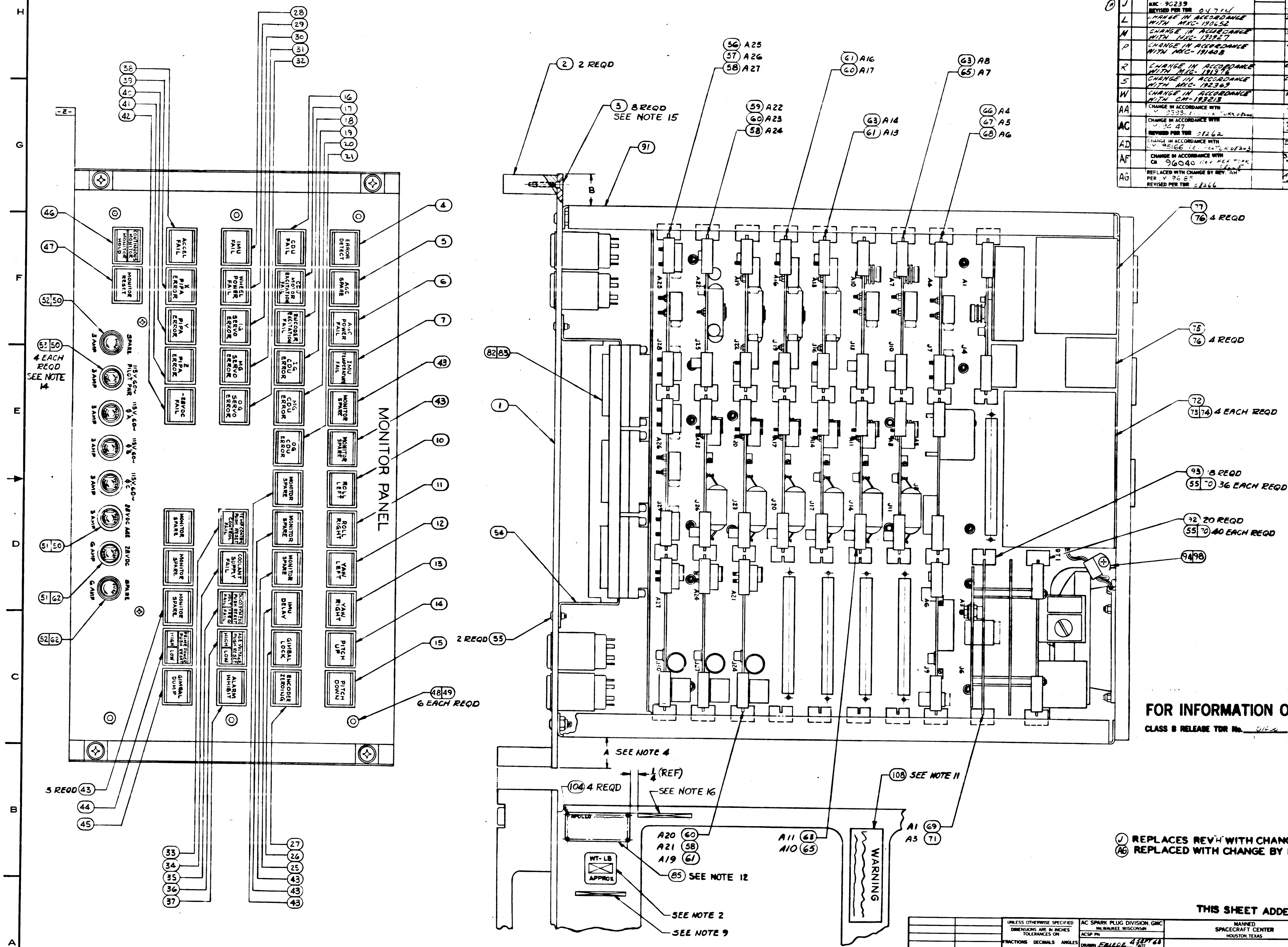
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL ASSEMBLY

CODE IDENT NO.
SIZE E
1900055
SCALE FULL
SHEET 1 OF 3

1900055 SHT 1 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
J		REPLACES REV. "H" WITH CHANGE PER MXC-90239 REVISED PER TDR 04714		7-Nov-63	JEL
L		CHANGE IN ACCORDANCE WITH MXC-190652		27-DEC-63	M.G.
M		CHANGE IN ACCORDANCE WITH MXC-190927		3-[illegible]-63	M.G.
P		CHANGE IN ACCORDANCE WITH MXC-191408		[illegible]	M.G.
R		CHANGE IN ACCORDANCE WITH MXC-191976		[illegible]-64	M.G.
S		CHANGE IN ACCORDANCE WITH MXC-192369		22-JAN-64	M.G.
W		CHANGE IN ACCORDANCE WITH CM-193213		3-[illegible]-64	M.G.
AA		CHANGE IN ACCORDANCE WITH CY-9393 [illegible] 08200		[illegible] FEB -66	[illegible]
AC		CHANGE IN ACCORDANCE WITH CY-96 47 REVISED PER TDR 08262		[illegible] FEB -22	[illegible]
AD		CHANGE IN ACCORDANCE WITH CY-95166 [illegible] 08263		25-FEB-22	[illegible]
AF		CHANGE IN ACCORDANCE WITH CM 96040 REV PER TDR [illegible]		30 MAR 64	[illegible]
AG		REPLACED WITH CHANGE BY REV. "AH" PER CY 9685 REVISED PER TDR 08266		APR [illegible]	[illegible]



MONITOR PANEL
CONTINUOUS MONITOR / MONITOR HOLD
MONITOR RESET
ACCEL FAIL
X PIPA ERROR
Y PIPA ERROR
Z PIPA ERROR
-28VDC FAIL
IMU FAIL
WHEEL POWER FAIL
IG SERVO ERROR
MG SERVO ERROR
OG SERVO ERROR
CDU FAIL
CDU MOTOR EXCITATION FAIL
ENCODER EXCITATION FAIL
IG CDU ERROR
MG CDU ERROR
OG CDU ERROR
ERROR DETECT
AGC SPARE
AGC POWER FAIL
IMU TEMPERATURE FAIL
MONITOR SPARE
ROLL LEFT
ROLL RIGHT
YAW LEFT
YAW RIGHT
PITCH UP
PITCH DOWN
TEMP CONTROL PUSH RESET CONTROL FAIL
COOLANT SUPPLY FAIL
DC-SYNCHRO PUSH RESET VOLT FAIL FREQ FAIL
AGE VOLTAGE PUSH RESET HIGH LOW
PRIME POWER PUSH RESET HIGH LOW
ALARM INHIBIT
GIMBAL DUMP
IMU DELAY
GIMBAL LOCK
ENCODER ZEROING
SPARE 3 AMP
115V 60~ PILOT PWR 3 AMP
115V 60~ ØA 3 AMP
115V 60~ ØB 3 AMP
115V 60~ ØC 3 AMP
28VDC AGE 3 AMP
28VDC 6 AMP
SPARE 6 AMP
2 2 REQD
3 8 REQD SEE NOTE 15
53 50 4 EACH REQD SEE NOTE 14
48 49 6 EACH REQD
3 REQD 43
2 REQD 55
77 76 4 REQD
75 76 4 REQD
72 73 74 4 EACH REQD
93 8 REQD
55 70 36 EACH REQD
92 20 REQD
55 70 40 EACH REQD
94 98
82 83
91
54
A SEE NOTE 4
1/4 (REF)
104 4 REQD
SEE NOTE 16
108 SEE NOTE 11
85 SEE NOTE 12
SEE NOTE 2
SEE NOTE 9
WT-LB APPROX
APOLLO
WARNING
56 A25
57 A26
58 A27
59 A22
60 A23
58 A24
61 A16
60 A17
63 A14
61 A13
63 A8
65 A7
66 A4
67 A5
68 A6
A20 60
A21 58
A19 61
A11 68
A10 65
A1 69
A3 71

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01400 DATE 5 June 63

Ⓙ REPLACES REV "H" WITH CHANGE

Ⓐ REPLACED WITH CHANGE BY REV "AH"

THIS SHEET ADDED

1900004-011	1900004-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
NEXT ASSY	USED ON	DO NOT SCALE THIS DRAWING	DRAWN FRIEDE DATE 4 SEPT 63 CHECKED 11 SEP 63 APPROVAL 17 SEP 63 APPROVAL	MONITOR PANEL ASSEMBLY
APPLICATION		MATERIAL	NASA APPROVAL	CODE IDENT NO. SIZE E 1900055
		CONTRACT NAS 9-497	MIT APPROVAL	SCALE FULL SHEET 3 OF 3

1900055 AG

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
AH		REPLACES REV. AG WITH CHANGE PER CN 96 85 REVISED PER TDR c8266		10 APR 64 5-2-64	JVP
AJ		CHANGE IN ACCORDANCE WITH CM196672 TDRR c6267		12 May 64	WK

NOTES:

1: INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2: MARK WEIGHT OF ASSEMBLY, (67 LBS), PER ND1002123 ADJACENT TO NAMEPLATE LOCATION.

3: CHASSIS SLIDE MOUNTING SCREWS, ITEM (80) AND FRONT PANEL MOUNTING SCREWS, ITEM (48) SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.

4: DIMENSION A MUST BE EQUAL TO DIMENSION B WITHIN .040.

5: VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

6: SOLDER PER MIL-S-6872 (ES 2505-1) USING ITEMS (89) & (90)

7:

8: SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

9: MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

10: SELECT AS REQUIRED.

11: APPLY WARNING PLATE ITEM (108) TO AREA INDICATED USING SOLVENT ACTIVATOR METHYLETHYL KETONE OR EQUIVALENT. CENTRALIZE AS SHOWN.

12: MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM (85) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH

13. SPOT TIE AS REQUIRED USING ITEM (112).

14. BEND TERMINAL NO. 2 ON THE FUSE HOLDER (ITEM (53)) 90° AWAY FROM THE BODY OF THE FUSE.

15. SECURE SCREWS USING ITEM (113).

16. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		114	MS 35216-40	SCREW MACHINE PAN HD.
	AR		113	MIL-S-40083-CL30	SEALING COMPOUND (ES-2544-5)
	AR		112	MIL-T-713	LACING TAPE TYPE P, CLASS 2 BLACK (ES-2735 NO. 18)
SEE NOTE 5.	6		111	1015864-424	INSULATION, SLEEVING, ELEC.
	X		110	1900865	SCHEMATIC DIAGRAM, ELECTRICAL

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	X		109	ATP1900055	ASSEMBLY TEST PROCEDURE
	1		108	1900617	WARNING PLATE, SELF BONDING
			107		
			106		
	1		105	MS35059-23	SWITCH - TOGGLE
	4		104	AN535-00-4	SCREW, DRIVE, ROUND HEAD
	1		103	1900783-011	RELAY BRACKET ASSEMBLY, A28
SEE NOTE 5	50		102	1016151-004	NUT- SELF LOCKING
	50		101	MS-35216-16	SCREW, MACHINE, PAN HD
	1		100	1900780-011	RELAY BRACKET ASSEMBLY, A30
	1		99	1900792-011	RELAY BRACKET ASSEMBLY, A29
	18		98	MS-35216-42	SCREW, MACHINE, PAN HD
	1		97	1901570-011	BELL, ELECTRICAL (24VDC)
	3		96	AN363 C832 (1896990-281)	NUT, SELF LOCKING
	1		95	CS13AG18CK (1896954-181)	CAPACITOR, MIL-C-26655-2
	1		94	MS21919 DG-2	CLAMP, CUSHIONED, SUPPORT
	18		93	1900391	BRACKET HOLDER, DOUBLE
	20		92	1900390	BRACKET HOLDER, SINGLE
	1		91	1900558	DRAWER, MONITOR PANEL (INSEP)
	AR		90	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		89	MIL-F-14256 QQ-S-571	FLUX (ES-2798) TYPE AR (ES-2175)
SEE NOTE 5	10		88	1016005-1	SHIM, SLIDE LOCATING
	1		87	MS35431-3	TERMINAL LUG
SEE NOTE 10	4EA		86	MS21919-DG8 THRU 12	CLAMP, CUSHIONED, SUPPORT
	1		85	1901304-101	NAMEPLATE
	12		84	MS-35216-26	SCREW, MACHINE, PAN HD
			83		
	1		82	1900852	WIRING HARNESS B
	1		81	1900196	WIRING HARNESS A
SEE NOTE 5	10		80	1015826-304	SCREW, FLAT HEAD, HEX SOCKET
SEE NOTE 5	1		79	1015791-009	SLIDE ASSY, QUICK RELEASE, R.H.
SEE NOTE 5	1		78	1015791-010	SLIDE ASSY, QUICK RELEASE, L.H.
SEE NOTE 5	1		77	1016104	TRANSFORMER
	20		76	AN363 C632 (1896990-261)	NUT, SELF LOCKING
SEE NOTE 5	1		75	1016085	REACTOR
	4		74	MS-35217-69	SCREW, PAN HD
	4		73	AN363 C428 (1896990-041)	NUT, SELF LOCKING
SEE NOTE 5	1		72	1015944-001	BATTERY, STORAGE-24VOLT
	1		71	1900447-011	3200CPS FREQUENCY COMPARATOR
	78		70	MS35333-71	WASHER, LOCK, FLAT, INTERNAL TOOTH
	1		69	1900492-011	PILOT POWER SUPPLY, ±28V DC
	1		68	1900487-011	VOLTAGE COMPARATOR, 2 VOLT, 3200 CPS
	1		67	1900707-011	VERIFICATION ASSEMBLY
	1		66	1900613-011	ENCODER ZEROING & -28VDC SENSOR
	2		65	1900370-011	WHEEL POWER & CDU MOTOR EXCITATION FAILURE SENSOR
			64		
	3		63	1900376-011	IG, MG OR OG SERVO ERROR SENSOR
	2		62	MS-90078-15-1 (1897077-115)	FUSE
	3		61	1900374-011	IMU, ACCEL OR CDU FAIL SENSOR
	3		60	1900372-011	PIPA SENSOR
	1		59	1900419-011	ENCODER EXCITATION FAILURE SENSOR ASSEMBLY
	3		58	1900373-011	IG, MG OR OG CDU ERROR SENSOR
	1		57	1900378-011	AGC SPARE, AGC POWER FAIL, ERROR DETECT & IMU DELAY SENSOR
	1		56	1900375-011	IMU TEMP. FAIL, MASTER WARNING & MASTER ALARM SENSOR
	78		55	MS-35216-27	SCREW, MACHINE, PAN HD
	1		54	1900793	BRACKET-CONNECTOR (INSEP) ASSY
SEE NOTE 5	4		53	1015873-001	FUSEHOLDER - INDICATING
	2		52	MS-26572-1	FUSEHOLDER
SEE NOTE 5	2		51	1015873-008	FUSEHOLDER - INDICATING
	6		50	MS-90078-12-1 (1897077-112)	FUSE
	6		49	AN363 C1032 (1896990-011)	NUT, SELF LOCKING
SEE NOTE 5	6		48	1006783-45	SCREW, BUTTON HD, HEX SOCK
	1		47	1015869-339	LIGHT-INDICATOR & SWITCH ASSY
	1		46	1015869-520	LIGHT INDICATOR & SWITCH ASSY
	1		45	1015869-147	LIGHT-INDICATOR & SWITCH ASSY
	1		44	1015869-725	LIGHT-INDICATOR & SWITCH ASSY
	8		43	1015869-151	LIGHT-INDICATOR & SWITCH ASSY
	1		42	1015869-150	LIGHT-INDICATOR & SWITCH ASSY
	1		41	1015869-129	LIGHT-INDICATOR & SWITCH ASSY
	1		40	1015869-128	LIGHT-INDICATOR & SWITCH ASSY
	1		39	1015869-127	LIGHT-INDICATOR & SWITCH ASSY
	1		38	1015869-126	LIGHT-INDICATOR & SWITCH ASSY
	1		37	1015869-340	LIGHT INDICATOR & SWITCH ASSY
	1		36	1015869-342	LIGHT INDICATOR & SWITCH ASSY

LIST OF PARTS AND MATERIALS

AH REPLACES REV AG WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

			AJ	AJ	AJ
			AH	AH	AH
SHEET 1	SHEET 2	SHEET 3	SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS			REVISION STATUS OF SHEETS		

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		35	1015869-344	LIGHT INDICATOR & SWITCH ASSY
	1		34	1015869-158	LIGHT INDICATOR & SWITCH ASSY
	1		33	1015869-343	LIGHT INDICATOR & SWITCH ASSY
	1		32	1015869-125	LIGHT INDICATOR & SWITCH ASSY
	1		31	1015869-124	LIGHT INDICATOR & SWITCH ASSY
	1		30	1015869-123	LIGHT INDICATOR & SWITCH ASSY
	1		29	1015869-122	LIGHT INDICATOR & SWITCH ASSY
	1		28	1015869-121	LIGHT INDICATOR & SWITCH ASSY
	1		27	1015869-149	LIGHT INDICATOR & SWITCH ASSY
	1		26	1015869-146	LIGHT INDICATOR & SWITCH ASSY
	1		25	1015869-145	LIGHT INDICATOR & SWITCH ASSY
			24		
			23		
			22		
	1		21	1015869-119	LIGHT INDICATOR & SWITCH ASSY
	1		20	1015869-118	LIGHT INDICATOR & SWITCH ASSY
	1		19	1015869-117	LIGHT INDICATOR & SWITCH ASSY
	1		18	1015869-120	LIGHT INDICATOR & SWITCH ASSY
	1		17	1015869-116	LIGHT INDICATOR & SWITCH ASSY
	1		16	1015869-115	LIGHT INDICATOR & SWITCH ASSY
	1		15	1015869-141	LIGHT INDICATOR & SWITCH ASSY
	1		14	1015869-140	LIGHT INDICATOR & SWITCH ASSY
	1		13	1015869-139	LIGHT INDICATOR & SWITCH ASSY
	1		12	1015869-138	LIGHT INDICATOR & SWITCH ASSY
	1		11	1015869-137	LIGHT INDICATOR & SWITCH ASSY
	1		10	1015869-136	LIGHT INDICATOR & SWITCH ASSY
			9		
			8		
	1		7	1015869-112	LIGHT INDICATOR & SWITCH ASSY
	1		6	1015869-111	LIGHT INDICATOR & SWITCH ASSY
	1		5	1015869-110	LIGHT INDICATOR & SWITCH ASSY
	1		4	1015869-109	LIGHT INDICATOR & SWITCH ASSY
SEE NOTE 5	8		3	1015831-253	SCREW, FLAT HD 100° (HEX SOCKET)
	2		2	1900015-061	HANDLE ASSEMBLY
	1		1	1900499	PANEL, FRONT

LIST OF MATERIALS OR PARTS LIST

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH ~~NUMBER THAT APPLIES~~

NEXT ASSY	USED ON	APPLICABLE DASH NO.
~~1900004-011~~	1900004-011	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 4 SEPT 63
CHECKED W. Dill 11 SEP 63
APPROVAL J. L. Williams 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900055
SCALE FULL
SHEET 1 OF 3

1900055 AJ

NOTES:

1: INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2: MARK WEIGHT OF ASSEMBLY, (67 LBS), PER ND1002123 ADJACENT TO NAMEPLATE LOCATION.

3: CHASSIS SLIDE MOUNTING SCREWS, ITEM (80) AND FRONT PANEL MOUNTING SCREWS, ITEM (48) SHALL BE SUBJECTED TO TORQUE OF 37-40 IN.LB AT INSTALLATION.

4: DIMENSION A MUST BE EQUAL TO DIMENSION B WITHIN .040.

5: VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

6: SOLDER PER MIL-S-6872(ES 2505-1) USING ITEMS (89) & (90)

7:

8: SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

9: MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

10: SELECT AS REQUIRED.

11: APPLY WARNING PLATE ITEM (108) TO AREA INDICATED USING SOLVENT ACTIVATOR METHYLETHYL KETONE OR EQUIVALENT. CENTRALIZE AS SHOWN.

12: MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM (85) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH

13. SPOT TIE AS REQUIRED USING ITEM (112).

14. BEND TERMINAL NO. 2 ON THE FUSE HOLDER (ITEM (53)) 90° AWAY FROM THE BODY OF THE FUSE.

15. SECURE SCREWS USING ITEM (113).

16. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		115	1015869-174	LIGHT INDICATOR & SWITCH ASSY
	2		114	MS 35216-40	SCREW MACHINE, PAN HD.
	AR		113	MIL-S-40083-CL30	SEALING COMPOUND (ES-2544-5)
	AR		112	MIL-T-713	LACING TAPE TYPE P, CLASS 2 BLACK (ES-2735 NO. 18)
SEE NOTE 5.	6		111	1015864-424	INSULATION, SLEEVING, ELEC.
	X		110	1900865	SCHEMATIC DIAGRAM, ELECTRICAL

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	X		109	ATP1900055	ASSEMBLY TEST PROCEDURE
	1		108	1900617	WARNING PLATE, SELF BONDING
			107		
			106		
	1		105	MS35059-23	SWITCH - TOGGLE
	4		104	AN535-00-4	SCREW, DRIVE, ROUND HEAD
	1		103	1900783-011	RELAY BRACKET ASSEMBLY, A28
SEE NOTE 5	50		102	1016151-004	NUT- SELF LOCKING
	50		101	MS-35216-16	SCREW, MACHINE, PAN HD
	1		100	1900780-011	RELAY BRACKET ASSEMBLY, A3C
	1		99	1900792-011	RELAY BRACKET ASSEMBLY, A29
	18		98	MS-35216-42	SCREW, MACHINE, PAN HD
	1		97	1901570-011	BELL, ELECTRICAL (24 VDC)
	3		96	AN363C832(1896990-281)	NUT, SELF LOCKING
	1		95	CS13AG18CK(1896954-181)	CAPACITOR, MIL-C-26655-2
	1		94	MS21919 DG-2	CLAMP, CUSHIONED, SUPPORT
	18		93	1900391	BRACKET HOLDER, DOUBLE
	20		92	1900390	BRACKET HOLDER, SINGLE
	1		91	1900558	DRAWER, MONITOR PANEL (INSEP)
	AR		90	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		89	MIL-F-14256 QQ-S-571	FLUX (ES-2798) TYPE AR (ES-2175)
SEE NOTE 5	10		88	1016005-1	SHIM, SLIDE LOCATING
	1		87	MS35431-3	TERMINAL LUG
SEE NOTE 10	4EA		86	MS21919-DG8 THRU12	CLAMP, CUSHIONED, SUPPORT
	1		85	1901304-101	NAMEPLATE
	12		84	MS-35216-26	SCREW, MACHINE, PAN HD
			83		
	1		82	1900852	WIRING HARNESS B
	1		81	1900196	WIRING HARNESS A
SEE NOTE 5	10		80	1015826-304	SCREW, FLAT HEAD, HEX SOCKET
SEE NOTE 5	1		79	1015791-009	SLIDE ASSY, QUICK RELEASE, R.H.
SEE NOTE 5	1		78	1015791-010	SLIDE ASSY, QUICK RELEASE, L.H.
SEE NOTE 5	1		77	1016104	TRANSFORMER
	20		76	AN363C632(1896990-261)	NUT, SELF LOCKING
SEE NOTE 5	1		75	1016085	REACTOR
	4		74	MS-35217-69	SCREW, PAN HD
	4		73	AN363C428(1896990-041)	NUT, SELF LOCKING
SEE NOTE 5	1		72	1015944-001	BATTERY, STORAGE-24 VOLT
	1		71	1900447-011	3200 CPS FREQUENCY COMPARATOR
	78		70	MS35333-71	WASHER LOCK, FLAT, INTERNAL TOOTH
	1		69	1900492-011	PILOT POWER SUPPLY, ±28 V DC
	1		68	1900487-011	VOLTAGE COMPARATOR, 2 VOLT, 3200 CPS
	1		67	1900707-011	VERIFICATION ASSEMBLY
	1		66	1900613-011	ENCODER ZEROING & -28V DC SENSOR
	2		65	1900370-011	WHEEL POWER & CDU MOTOR EXCITATION FAILURE SENSOR
			64		
	3		63	1900376-011	IG, MG OR OG SERVO ERROR SENSOR
	2		62	MS-90078-15-1(1897077-115)	FUSE
	3		61	1900374-011	IMU, ACCEL OR CDU FAIL SENSOR
	3		60	1900372-011	PIPA SENSOR
	1		59	1900419-011	ENCODER EXCITATION FAILURE SENSOR ASSEMBLY
	3		58	1900373-011	IG, MG OR OG CDU ERROR SENSOR
	1		57	1900378-011	AGC SPARE, AGC POWER FAIL, ERROR DETECT & IMU DELAY SENSOR
	1		56	1900375-011	IMU TEMP. FAIL, MASTER WARNING & MASTER ALARM SENSOR
	78		55	MS-35216-27	SCREW, MACHINE, PAN HD
	1		54	1900793	BRACKET-CONNECTOR (INSEP) ASSY
SEE NOTE 5	4		53	1015873-001	FUSEHOLDER - INDICATING
	2		52	MS-26572-1	FUSEHOLDER
SEE NOTE 5	2		51	1015873-008	FUSEHOLDER - INDICATING
	6		50	MS-90078-12-1(1897077-112)	FUSE
	6		49	AN363C1032(1896990-011)	NUT, SELF LOCKING
SEE NOTE 5	6		48	1006783-45	SCREW, BUTTON HD, HEX SOCK
	1		47	1015869-339	LIGHT-INDICATOR & SWITCH ASSY
	1		46	1015869-520	LIGHT INDICATOR & SWITCH ASSY
	1		45	1015869-147	LIGHT-INDICATOR & SWITCH ASSY
	1		44	1015869-725	LIGHT-INDICATOR & SWITCH ASSY
	7		43	1015869-151	LIGHT-INDICATOR & SWITCH ASSY
	1		42	1015869-150	LIGHT-INDICATOR & SWITCH ASSY
	1		41	1015869-129	LIGHT-INDICATOR & SWITCH ASSY
	1		40	1015869-128	LIGHT-INDICATOR & SWITCH ASSY
	1		39	1015869-127	LIGHT-INDICATOR & SWITCH ASSY
	1		38	1015869-126	LIGHT-INDICATOR & SWITCH ASSY
	1		37	1015869-340	LIGHT INDICATOR & SWITCH ASSY
	1		36	1015869-342	LIGHT INDICATOR & SWITCH ASSY

LIST OF PARTS AND MATERIALS

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH ~~NUMBER THAT APPLIES~~

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
AH		REPLACES REV. AG WITH CHANGE PER CM 196185 REVISED PER TDR C8266		10 APR 64 5-2-64	JWP WK
AJ		CHANGE IN ACCORDANCE WITH CM196672 TDRR 08267		12 MAY 64	WK
AK		CHANGE IN ACCORDANCE WITH CM 197019 TDRR 10278		25 MAY 64	RJW / AU
AL		CHANGE IN ACCORDANCE WITH CM 197678 TDRR 10745		6 JUN 64	GG / FK

(AH) REPLACES REV "AG" WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

SHEET 1	SHEET 2	SHEET 3
AL	AJ	AK
AK	AJ	AK
AJ	AJ	AJ
AH	AH	AH

REVISION STATUS OF SHEETS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		35	1015869-344	LIGHT INDICATOR & SWITCH ASSY
	1		34	1015869-158	LIGHT INDICATOR & SWITCH ASSY
	1		33	1015869-343	LIGHT INDICATOR & SWITCH ASSY
	1		32	1015869-125	LIGHT INDICATOR & SWITCH ASSY
	1		31	1015869-124	LIGHT INDICATOR & SWITCH ASSY
	1		30	1015869-123	LIGHT INDICATOR & SWITCH ASSY
	1		29	1015869-122	LIGHT INDICATOR & SWITCH ASSY
	1		28	1015869-121	LIGHT INDICATOR & SWITCH ASSY
	1		27	1015869-149	LIGHT INDICATOR & SWITCH ASSY
	1		26	1015869-175	LIGHT INDICATOR & SWITCH ASSY
	1		25	1015869-145	LIGHT INDICATOR & SWITCH ASSY
			24		
			23		
			22		
	1		21	1015869-119	LIGHT INDICATOR & SWITCH ASSY
	1		20	1015869-118	LIGHT INDICATOR & SWITCH ASSY
	1		19	1015869-117	LIGHT INDICATOR & SWITCH ASSY
	1		18	1015869-120	LIGHT INDICATOR & SWITCH ASSY
	1		17	1015869-116	LIGHT INDICATOR & SWITCH ASSY
	1		16	1015869-115	LIGHT INDICATOR & SWITCH ASSY
	1		15	1015869-141	LIGHT INDICATOR & SWITCH ASSY
	1		14	1015869-140	LIGHT INDICATOR & SWITCH ASSY
	1		13	1015869-139	LIGHT INDICATOR & SWITCH ASSY
	1		12	1015869-138	LIGHT INDICATOR & SWITCH ASSY
	1		11	1015869-137	LIGHT INDICATOR & SWITCH ASSY
	1		10	1015869-136	LIGHT INDICATOR & SWITCH ASSY
			9		
			8		
	1		7	1015869-112	LIGHT INDICATOR & SWITCH ASSY
	1		6	1015869-111	LIGHT INDICATOR & SWITCH ASSY
	1		5	1015869-110	LIGHT INDICATOR & SWITCH ASSY
	1		4	1015869-109	LIGHT INDICATOR & SWITCH ASSY
SEE NOTE 5	8		3	1015831-253	SCREW, FLAT HD 100° (HEX SOCKET)
	2		2	1900015-061	HANDLE ASSEMBLY
	1		1	1900499	PANEL, FRONT

LIST OF MATERIALS OR PARTS LIST

NEXT ASSY	USED ON	APPLICABLE DASH NO.
~~1900004-011~~	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 4 SEPT 63
CHECKED W. Diehl 11 SEP 63
APPROVAL Williams 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL ASSEMBLY

CODE IDENT NO.
SIZE E
1900055
SCALE FULL
SHEET 1 OF 3

1900055AL

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
AH		REPLACES REV. AG WITH CHANGE PER CM 96185 REVISED PER TDR 08266		10 APR 64	JWP
Ⓜ AJ		CHANGE IN ACCORDANCE WITH CM196672 TDRR 08267		12 MAY 64	WK
AK		CHANGE IN ACCORDANCE WITH CM 197019 TDRR 10278		25 MAY 64	RJW AU
Ⓜ AL		CHANGE IN ACCORDANCE WITH CM 197678 TDRR 10745		6 JUN 64	GG FK
AM		REVISED PER TDRR 10873		20 JUL 64	RJF

NOTES:

1: INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2: MARK WEIGHT OF ASSEMBLY, (67 LBS), PER ND1002123 ADJACENT TO NAMEPLATE LOCATION.

3: CHASSIS SLIDE MOUNTING SCREWS, ITEM (80) AND FRONT PANEL MOUNTING SCREWS, ITEM (48) SHALL BE SUBJECTED TO TORQUE OF 37-40 IN.LB AT INSTALLATION.

4: DIMENSION A MUST BE EQUAL TO DIMENSION B WITHIN .040.

5: VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

6: SOLDER PER MIL-S-6872 (ES 2505-1) USING ITEMS (89) & (90)

7:

8: SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

9: MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

10: SELECT AS REQUIRED.

11: APPLY WARNING PLATE ITEM (108) TO AREA INDICATED USING SOLVENT ACTIVATOR METHYLETHYL KETONE OR EQUIVALENT. CENTRALIZE AS SHOWN.

12: MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM (85) IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH

13. SPOT TIE AS REQUIRED USING ITEM (112).

14. BEND TERMINAL NO. 2 ON THE FUSE HOLDER (ITEM (53)) 90° AWAY FROM THE BODY OF THE FUSE.

15. SECURE SCREWS USING ITEM (113).

16. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		115	1015869-174	LIGHT INDICATOR & SWITCH ASSY
	2		114	MS 35216-40	SCREW MACHINE, PAN HD.
	AR		113	MIL-S-40083-CL30	SEALING COMPOUND (ES-2544-5)
	AR		112	MIL-T-713	LACING TAPE TYPE P, CLASS 2 BLACK (ES-2735 NO. 18)
SEE NOTE 5.	6		111	1015864-424	INSULATION, SLEEVING, ELEC.
	X		110	1900865	SCHEMATIC DIAGRAM, ELECTRICAL

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	X		109	ATP1900055	ASSEMBLY TEST PROCEDURE
	1		108	1900617	WARNING PLATE, SELF BONDING
			107		
			106		
	1		105	MS35059-23	SWITCH - TOGGLE
	4		104	AN535-00-4	SCREW, DRIVE, ROUND HEAD
	1		103	1900783-011	RELAY BRACKET ASSEMBLY, A28
SEE NOTE 5	50		102	1016151-004	NUT- SELF LOCKING
	50		101	MS-35216-16	SCREW, MACHINE, PAN HD
	1		100	1900780-011	RELAY BRACKET ASSEMBLY, A3C
	1		99	1900792-011	RELAY BRACKET ASSEMBLY, A29
	18		98	MS-35216-42	SCREW, MACHINE, PAN HD
	1		97	1901570-011	BELL, ELECTRICAL (24VDC)
	3		96	AN363C832 (1896990-281)	NUT, SELF LOCKING
	1		95	CS13AG18CK (1896954-181)	CAPACITOR, MIL-C-26655-2
	1		94	MS21919DG-2	CLAMP, CUSHIONED, SUPPORT
	18		93	1900391	BRACKET HOLDER, DOUBLE
	20		92	1900390	BRACKET HOLDER, SINGLE
	1		91	1900558	DRAWER, MONITOR PANEL (INSEP)
	AR		90	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		89	MIL-F-14256 QQ-S-571	FLUX (ES-2798) TYPE AR (ES-2175)
SEE NOTE 5	10		88	1016005-1	SHIM, SLIDE LOCATING
	1		87	MS35431-3	TERMINAL LUG
SEE NOTE 10	4EA		86	MS21919-DG8 THRU 12	CLAMP, CUSHIONED, SUPPORT
	1		85	1901304-101	NAMEPLATE
	12		84	MS-35216-26	SCREW, MACHINE, PAN HD
			83		
	1		82	1900852	WIRING HARNESS B
	1		81	1900196	WIRING HARNESS A
SEE NOTE 5	10		80	1015826-304	SCREW, FLAT HEAD, HEX SOCKET
SEE NOTE 5	1		79	1015791-009	SLIDE ASSY, QUICK RELEASE, R.H.
SEE NOTE 5	1		78	1015791-010	SLIDE ASSY, QUICK RELEASE, L.H.
SEE NOTE 5	1		77	1016104	TRANSFORMER
	20		76	AN363C632 (1896990-261)	NUT, SELF LOCKING
SEE NOTE 5	1		75	1016085	REACTOR
	4		74	MS-35217-69	SCREW, PAN HD
	4		73	AN363C428 (1896990-041)	NUT, SELF LOCKING
SEE NOTE 5	1		72	1015944-001	BATTERY, STORAGE-24VOLT
	1		71	1900447-011	3200CPS FREQUENCY COMPARATOR
	78		70	MS35333-71	WASHER, LOCK, FLAT, INTERNAL TOOTH
	1		69	1900492-011	PILOT POWER SUPPLY, ±28V DC
	1		68	1900487-011	VOLTAGE COMPARATOR, 2 VOLT, 3200 CPS
	1		67	1900707-011	VERIFICATION ASSEMBLY
	1		66	1900613-011	ENCODER ZEROING & -28VDC SENSOR
	2		65	1900370-011	WHEEL POWER & CDU MOTOR EXCITATION FAILURE SENSOR
			64		
	3		63	1900376-011	IG, MG OR OG SERVO ERROR SENSOR
	2		62	MS-90078-15-1 (1897077-115)	FUSE
	3		61	1900374-011	IMU, ACCEL OR CDU FAIL SENSOR
	3		60	1900372-011	PIPA SENSOR
	1		59	1900419-011	ENCODER EXCITATION FAILURE SENSOR ASSEMBLY
	3		58	1900373-011	IG, MG OR OG CDU ERROR SENSOR
	1		57	1900378-011	AGC SPARE, AGC POWER FAIL, ERROR DETECT & IMU DELAY SENSOR
	1		56	1900375-011	IMU TEMP. FAIL, MASTER WARNING & MASTER ALARM SENSOR
	78		55	MS-35216-27	SCREW, MACHINE, PAN HD
	1		54	1900793	BRACKET-CONNECTOR (INSEP) ASSY
SEE NOTE 5	4		53	1015873-001	FUSEHOLDER-INDICATING
	2		52	MS-26572-1	FUSEHOLDER
SEE NOTE 5	2		51	1015873-008	FUSEHOLDER-INDICATING
	6		50	MS-90078-12-1 (1897077-112)	FUSE
	6		49	AN363C1032 (1896990-011)	NUT, SELF LOCKING
SEE NOTE 5	6		48	1006783-45	SCREW, BUTTON HD, HEX SOCK
	1		47	1015869-339	LIGHT-INDICATOR & SWITCH ASSY
	1		46	1015869-520	LIGHT INDICATOR & SWITCH ASSY
	1		45	1015869-147	LIGHT-INDICATOR & SWITCH ASSY
	1		44	1015869-725	LIGHT-INDICATOR & SWITCH ASSY
	7		43	1015869-151	LIGHT-INDICATOR & SWITCH ASSY
	1		42	1015869-150	LIGHT-INDICATOR & SWITCH ASSY
	1		41	1015869-129	LIGHT-INDICATOR & SWITCH ASSY
	1		40	1015869-128	LIGHT-INDICATOR & SWITCH ASSY
	1		39	1015869-127	LIGHT-INDICATOR & SWITCH ASSY
	1		38	1015869-126	LIGHT-INDICATOR & SWITCH ASSY
	1		37	1015869-340	LIGHT INDICATOR & SWITCH ASSY
	1		36	1015869-342	LIGHT INDICATOR & SWITCH ASSY

LIST OF PARTS AND MATERIALS

Ⓐⓗ REPLACES REV "AG" WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

SHEET 1	SHEET 2	SHEET 3

REVISION STATUS OF SHEETS

AM	AJ	AK
AL	AJ	AK
AK	AJ	AK
AJ	AJ	AJ
AH	AH	AH
SHEET 1	SHEET 2	SHEET 3

REVISION STATUS OF SHEETS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		35	1015869-344	LIGHT INDICATOR & SWITCH ASSY
	1		34	1015869-158	LIGHT INDICATOR & SWITCH ASSY
	1		33	1015869-343	LIGHT INDICATOR & SWITCH ASSY
	1		32	1015869-125	LIGHT INDICATOR & SWITCH ASSY
	1		31	1015869-124	LIGHT INDICATOR & SWITCH ASSY
	1		30	1015869-123	LIGHT INDICATOR & SWITCH ASSY
	1		29	1015869-122	LIGHT INDICATOR & SWITCH ASSY
	1		28	1015869-121	LIGHT INDICATOR & SWITCH ASSY
	1		27	1015869-149	LIGHT INDICATOR & SWITCH ASSY
	1		26	1015869-175	LIGHT INDICATOR & SWITCH ASSY
	1		25	1015869-145	LIGHT INDICATOR & SWITCH ASSY
			24		
			23		
			22		
	1		21	1015869-119	LIGHT INDICATOR & SWITCH ASSY
	1		20	1015869-118	LIGHT INDICATOR & SWITCH ASSY
	1		19	1015869-117	LIGHT INDICATOR & SWITCH ASSY
	1		18	1015869-120	LIGHT INDICATOR & SWITCH ASSY
	1		17	1015869-116	LIGHT INDICATOR & SWITCH ASSY
	1		16	1015869-115	LIGHT INDICATOR & SWITCH ASSY
	1		15	1015869-141	LIGHT INDICATOR & SWITCH ASSY
	1		14	1015869-140	LIGHT INDICATOR & SWITCH ASSY
	1		13	1015869-139	LIGHT INDICATOR & SWITCH ASSY
	1		12	1015869-138	LIGHT INDICATOR & SWITCH ASSY
	1		11	1015869-137	LIGHT INDICATOR & SWITCH ASSY
	1		10	1015869-136	LIGHT INDICATOR & SWITCH ASSY
			9		
			8		
	1		7	1015869-112	LIGHT INDICATOR & SWITCH ASSY
	1		6	1015869-111	LIGHT INDICATOR & SWITCH ASSY
	1		5	1015869-110	LIGHT INDICATOR & SWITCH ASSY
	1		4	1015869-109	LIGHT INDICATOR & SWITCH ASSY
Ⓐⓜ SEE NOTE 5	8		3	AN507C832R12	(1897003-568) SCREW, FLAT HD, 100°
	2		2	1900015-061	HANDLE ASSEMBLY
	1		1	1900499	PANEL, FRONT

LIST OF MATERIALS OR PARTS LIST

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH ~~NUMBER THAT APPLIES~~

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	-011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 4 SEPT 63
CHECKED W. Diehl 11 SEP 63
APPROVAL V. Williams 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900055
SCALE FULL
SHEET 1 OF 3

1900055 AM

SYM	ZONE	REVISIONS DESCRIPTION	CHG NO.	DATE	APPD.
AH		REPLACES REV. AG WITH CHANGE PER CM 96 85 REVISED PER TDR 08266		10 APR 64 5-2-64	JWP WK
Ⓜ AJ		CHANGE IN ACCORDANCE WITH CM 196672 TDRR 0E267		12 May 64	WK
AK		CHANGE IN ACCORDANCE WITH CM 97019 TDRR 10278		25 MAY 64	RJW AU
Ⓜ AL		CHANGE IN ACCORDANCE WITH CM 197678 TDRR 0745		6 JUN 64	GG FK
Ⓜ AM		REVISED PER TDRR 10873		20 JUL 64	RJF
AN		REVISED PER TDRR 3083		OCT 64	JWP

NOTES:

1: INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2: MARK WEIGHT OF ASSEMBLY, (67 LBS), PER ND1002123 ADJACENT TO NAMEPLATE LOCATION.

3: CHASSIS SLIDE MOUNTING SCREWS, ITEM (80) AND FRONT PANEL MOUNTING SCREWS, ITEM (48) SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.

4: DIMENSION A MUST BE EQUAL TO DIMENSION B WITHIN .040.

5: VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

6: SOLDER PER MIL-S-6872 (ES 2505-1) USING ITEMS (89) & (90)

7:

8: SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

9: MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

10: SELECT AS REQUIRED.

11: APPLY WARNING PLATE ITEM (108) TO AREA INDICATED USING SOLVENT ACTIVATOR METHYLETHYL KETONE OR EQUIVALENT. CENTRALIZE AS SHOWN.

12: MARK APPLICABLE CONTRACT NO. AND SERIAL NO. TO ITEM (85) IN ACCORDANCE WITH ND 1002023. LETTERS AND, NUMERALS TO BE .06 HIGH

13. SPOT TIE AS REQUIRED USING ITEM (112).

14. BEND TERMINAL NO. 2 ON THE FUSE HOLDER (ITEM (53)) 90° AWAY FROM THE BODY OF THE FUSE.

15. SECURE SCREWS USING ITEM (113).

16. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				X		116	1901597	RUNNING LIST
				1		115	1015869-174	LIGHT INDICATOR & SWITCH ASSY
				2		114	MS 35216-40	SCREW MACHINE PAN HD.
				AR		113	MIL-S-40083-CL30	SEALING COMPOUND (ES-2544-5)
				AR		112	MIL-T-713	LACING TAPE TYPE P, CLASS 2 BLACK (ES-2735 NO. 18)
SEE NOTE 5.				6		111	1015864-424	INSULATION, SLEEVING, ELEC.
				X		110	1900865	SCHEMATIC DIAGRAM, ELECTRICAL

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				X		109	ATP1900055	ASSEMBLY TEST PROCEDURE
				1		108	1900617	WARNING PLATE, SELF BONDING
						107		
						106		
				1		105	MS35059-23	SWITCH - TOGGLE
				4		104	AN535-00-4	SCREW, DRIVE, ROUND HEAD
				1		103	1900783-011	RELAY BRACKET ASSEMBLY, A28
SEE NOTE 5				50		102	1016151-004	NUT- SELF LOCKING
				50		101	MS-35216-16	SCREW, MACHINE, PAN HD
				1		100	1900780-011	RELAY BRACKET ASSEMBLY, A3C
				1		99	1900792-011	RELAY BRACKET ASSEMBLY, A29
				18		98	MS-35216-42	SCREW, MACHINE, PAN HD
				1		97	1901570-011	BELL, ELECTRICAL (24 VDC)
				3		96	AN363C832 (1896990-281)	NUT, SELF LOCKING
				1		95	CS13AG18CK (1896954-181)	CAPACITOR, MIL-C-26655-2
				1		94	MS21919DG-2	CLAMP, CUSHIONED, SUPPORT
				18		93	1900391	BRACKET HOLDER, DOUBLE
				20		92	1900390	BRACKET HOLDER, SINGLE
				1		91	1900558	DRAWER, MONITOR PANEL (INSEP)
				AR		90	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				AR		89	MIL-F-14256 QQ-S-571	FLUX (ES-2798) TYPE AR (ES-2175)
SEE NOTE 5				10		88	1016005-1	SHIM, SLIDE LOCATING
				1		87	MS35431-3	TERMINAL LUG
SEE NOTE 10				4 EA		86	MS21919-DG8 THRU 12	CLAMP, CUSHIONED, SUPPORT
				1		85	1901304-101	NAMEPLATE
				12		84	MS-35216-26	SCREW, MACHINE, PAN HD
						83		
				1		82	1900852	WIRING HARNESS B
				1		81	1900196	WIRING HARNESS A
SEE NOTE 5				10		80	1015826-304	SCREW, FLAT HEAD, HEX SOCKET
SEE NOTE 5				1		79	1015791-009	SLIDE ASSY, QUICK RELEASE, R.H.
SEE NOTE 5				1		78	1015791-010	SLIDE ASSY, QUICK RELEASE, L.H.
SEE NOTE 5				1		77	1016104	TRANSFORMER
				20		76	AN363C632 (1896990-261)	NUT, SELF LOCKING
SEE NOTE 5				1		75	1016085	REACTOR
				4		74	MS-35217-69	SCREW, PAN HD
				4		73	AN363C428 (1896990-041)	NUT, SELF LOCKING
SEE NOTE 5				1		72	1015944-001	BATTERY, STORAGE-24 VOLT
				1		71	1900447-011	3200 CPS FREQUENCY COMPARATOR
				78		70	MS35333-71	WASHER, LOCK, FLAT, INTERNAL TOOTH
				1		69	1900492-011	PILOT POWER SUPPLY, ±28 V DC
				1		68	1900487-011	VOLTAGE COMPARATOR, 2 VOLT, 3200 CPS
				1		67	1900707-011	VERIFICATION ASSEMBLY
				1		66	1900613-011	ENCODER ZEROING & -28V DC SENSOR
				2		65	1900370-011	WHEEL POWER & CDU MOTOR EXCITATION FAILURE SENSOR
						64		
				3		63	1900376-011	IG, MG OR OG SERVO ERROR SENSOR
				2		62	MS-90078-15-1 (1897077-115)	FUSE
				3		61	1900374-011	IMU, ACCEL OR CDU FAIL SENSOR
				3		60	1900372-011	PIPA SENSOR
				1		59	1900419-011	ENCODER EXCITATION FAILURE SENSOR ASSEMBLY
				3		58	1900373-011	IG, MG OR OG CDU ERROR SENSOR
				1		57	1900378-011	AGC SPARE, AGC POWER FAIL, ERROR DETECT & IMU DELAY SENSOR
				1		56	1900375-011	IMU TEMP. FAIL, MASTER WARNING & MASTER ALARM SENSOR
				78		55	MS-35216-27	SCREW, MACHINE, PAN HD
				1		54	1900793	BRACKET-CONNECTOR (INSEP) ASSY
SEE NOTE 5				4		53	1015873-001	FUSEHOLDER-INDICATING
				2		52	MS-26572-1	FUSEHOLDER
SEE NOTE 5				2		51	1015873-008	FUSEHOLDER-INDICATING
				6		50	MS-90078-12-1 (1897077-112)	FUSE
				6		49	AN363C1032 (1896990-011)	NUT, SELF LOCKING
SEE NOTE 5				6		48	1006783-45	SCREW, BUTTON HD, HEX SOCK
				1		47	1015869-339	LIGHT-INDICATOR & SWITCH ASSY
				1		46	1015869-520	LIGHT INDICATOR & SWITCH ASSY
				1		45	1015869-147	LIGHT-INDICATOR & SWITCH ASSY
				1		44	1015869-725	LIGHT-INDICATOR & SWITCH ASSY
				7		43	1015869-151	LIGHT-INDICATOR & SWITCH ASSY
				1		42	1015869-150	LIGHT-INDICATOR & SWITCH ASSY
				1		41	1015869-129	LIGHT-INDICATOR & SWITCH ASSY
				1		40	1015869-128	LIGHT-INDICATOR & SWITCH ASSY
				1		39	1015869-127	LIGHT-INDICATOR & SWITCH ASSY
				1		38	1015869-126	LIGHT-INDICATOR & SWITCH ASSY
				1		37	1015869-340	LIGHT INDICATOR & SWITCH ASSY
				1		36	1015869-342	LIGHT INDICATOR & SWITCH ASSY

LIST OF PARTS AND MATERIALS

Ⓐⓗ REPLACES REV AG WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

			AM	AJ	AK
			AL	AJ	AK
			AK	AJ	AK
			AJ	AJ	AJ
AN	AJ	AK	AH	AH	AH
SHEET 1	SHEET 2	SHEET 3	SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS			REVISION STATUS OF SHEETS		

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1		35	1015869-344	LIGHT INDICATOR & SWITCH ASSY
				1		34	1015869-158	LIGHT INDICATOR & SWITCH ASSY
				1		33	1015869-343	LIGHT INDICATOR & SWITCH ASSY
				1		32	1015869-125	LIGHT INDICATOR & SWITCH ASSY
				1		31	1015869-124	LIGHT INDICATOR & SWITCH ASSY
				1		30	1015869-123	LIGHT INDICATOR & SWITCH ASSY
				1		29	1015869-122	LIGHT INDICATOR & SWITCH ASSY
				1		28	1015869-121	LIGHT INDICATOR & SWITCH ASSY
				1		27	1015869-149	LIGHT INDICATOR & SWITCH ASSY
				1		26	1015869-175	LIGHT INDICATOR & SWITCH ASSY
				1		25	1015869-145	LIGHT INDICATOR & SWITCH ASSY
						24		
						23		
						22		
				1		21	1015869-119	LIGHT INDICATOR & SWITCH ASSY
				1		20	1015869-118	LIGHT INDICATOR & SWITCH ASSY
				1		19	1015869-117	LIGHT INDICATOR & SWITCH ASSY
				1		18	1015869-120	LIGHT INDICATOR & SWITCH ASSY
				1		17	1015869-116	LIGHT INDICATOR & SWITCH ASSY
				1		16	1015869-115	LIGHT INDICATOR & SWITCH ASSY
				1		15	1015869-141	LIGHT INDICATOR & SWITCH ASSY
				1		14	1015869-140	LIGHT INDICATOR & SWITCH ASSY
				1		13	1015869-139	LIGHT INDICATOR & SWITCH ASSY
				1		12	1015869-138	LIGHT INDICATOR & SWITCH ASSY
				1		11	1015869-137	LIGHT INDICATOR & SWITCH ASSY
				1		10	1015869-136	LIGHT INDICATOR & SWITCH ASSY
						9		
						8		
				1		7	1015869-112	LIGHT INDICATOR & SWITCH ASSY
				1		6	1015869-111	LIGHT INDICATOR & SWITCH ASSY
				1		5	1015869-110	LIGHT INDICATOR & SWITCH ASSY
				1		4	1015869-109	LIGHT INDICATOR & SWITCH ASSY
Ⓐⓜ SEE NOTE 5				8		3	AN507C832R12	(1897003-568) SCREW, FLAT HD, 100°
				2		2	1900015-061	HANDLE ASSEMBLY
				1		1	1900499	PANEL, FRONT

LIST OF MATERIALS OR PARTS LIST

1900055 AN

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH ~~NUMBER THAT APPLIES~~

NEXT ASSY	USED ON	APPLICABLE DASH NO.
~~1900004-011~~	1900004-011	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± —— ± —— ± ——
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

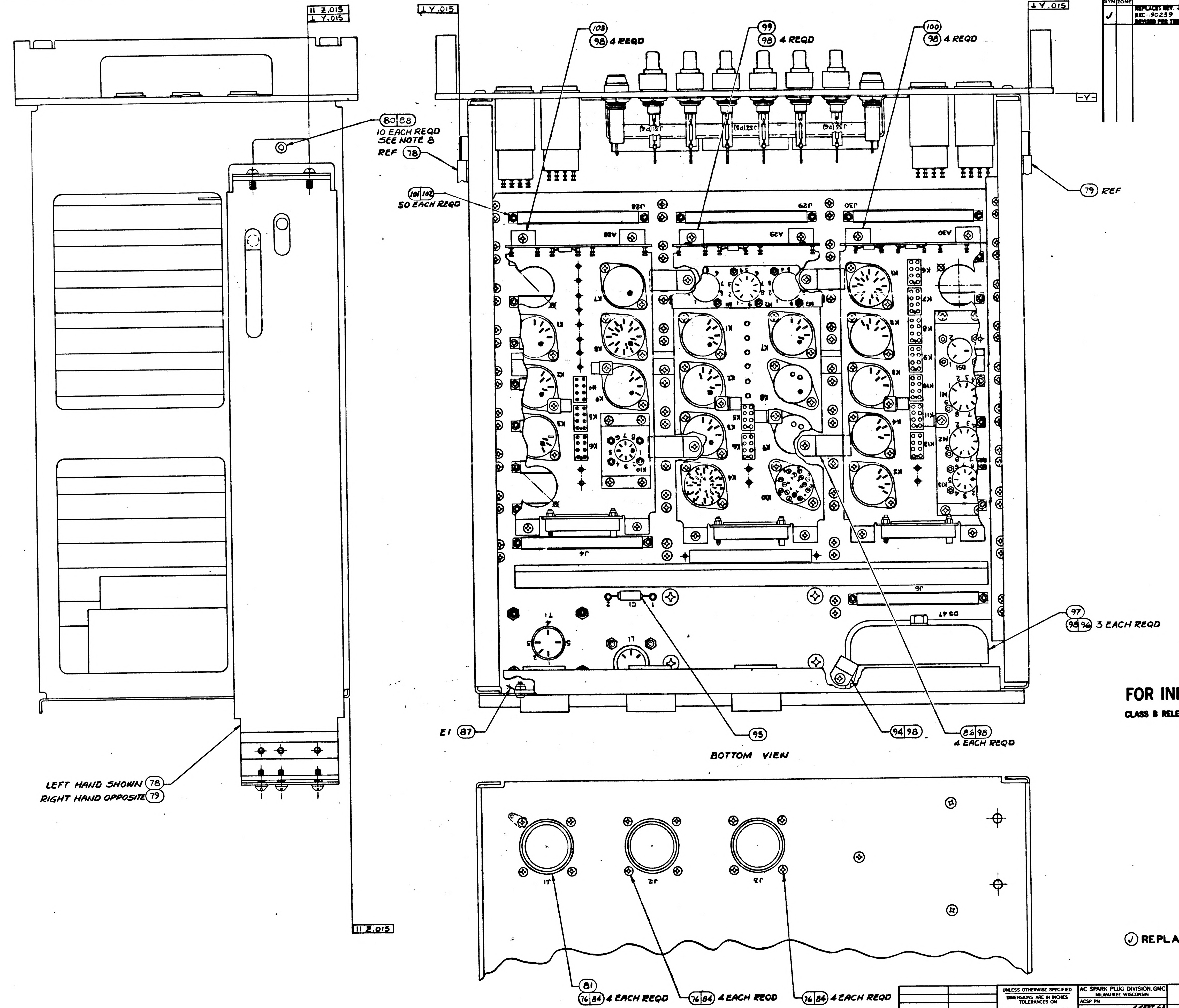
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 4 SEPT 63
CHECKED W. Dill 11 SEP 63
APPROVAL L. V. Williams 17 SEP 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL
ASSEMBLY

CODE IDENT NO.
SIZE E
1900055
SCALE FULL
SHEET 1 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
J		REPLACES REV. H WITH CHANGE PER RXC-90239 REVISED PER TDR 04714		[illegible] 63	[illegible]



II Z.015
⊥ Y.015
⊥ Y.015
⊥ Y.015
-Y-
108
98 4 REQD
99
98 4 REQD
100
98 4 REQD
80 88
10 EACH REQD
SEE NOTE 8
REF 78
79 REF
101 102
50 EACH REQD
J28
J29
J30
A28
A29
A30
J4
J6
DS41
C1
T1
L1
97
98 96 3 EACH REQD
E1 87
95
94 98
86 98
4 EACH REQD
BOTTOM VIEW
LEFT HAND SHOWN 78
RIGHT HAND OPPOSITE 79
II Z.015
J1
J2
J3
81
76 84 4 EACH REQD
76 84 4 EACH REQD
76 84 4 EACH REQD

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

Ⓙ REPLACES REV H WITH CHANGE

THIS SHEET ADDED

1900004-011	1900004-011	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± ± ±	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
NEXT ASSY	USED ON	DO NOT SCALE THIS DRAWING	DRAWN FRIEDE DATE 4 SEPT 63 CHECKED W. Diehl 11 Sep '63 APPROVAL [illegible] 17 SEP 63 APPROVAL [illegible]	MONITOR PANEL ASSEMBLY
APPLICATION		MATERIAL —	NASA APPROVAL [illegible]	CODE IDENT NO. SIZE E 1900055
		CONTRACT NAS 9-497	MIT APPROVAL [illegible]	SCALE FULL SHEET 2 OF 3

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		CHANGE IN ACCORDANCE WITH MXC 187709		1 JUN 63	WLG / EFB
B		CHANGE IN ACCORDANCE WITH MXC 188100		19 JUL 63	
C		CHANGE IN ACCORDANCE WITH MXC 188472		5 AUG 63	JGL
D		CHANGE IN ACCORDANCE WITH MXC 188860		21 AUG 63	DKD CFP
E		CHANGE IN ACCORDANCE WITH MXC 189122		9 SEP 63	
F		CHANGE IN ACCORDANCE WITH MXC 189217 PER TDRR 03715		13 SEPT 63	EL

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0466 DATE

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			200			1015818-624	CRIMP TYPE SOCKET CONTACTS
			200			1015817-624	CRIMP TYPE PIN CONTACTS
			1			1015818-620	CRIMP TYPE SOCKET CONTACTS
			1			1015817-620	CRIMP TYPE PIN CONTACTS
			3			1015818-660	CONNECTOR-PLUG, ELEC
			1			1900419-011	ENCODER EXCITATION FAIL SENSOR
			3			1015817-660	CONNECTOR-RECEPTACLE, ELEC
			1			1900707-011	VERIFICATION ASSEMBLY
			1			1900613-011	ENCODER ZEROING & -28VDC SENSOR
			15			IN645	(1896966-004) DIODE
			3			IN649	(1896966-006) DIODE
			1			1015957-166	CONNECTOR, RECEP, ELECTRICAL
			1			1900487-011	3200 CPS VOLTAGE COMPARATOR
			1			1900492-011	±28VDC PILOT POWER SUPPLY
			4			1015873-001	FUSEHOLDER-INDICATING
			2			1015873-008	FUSEHOLDER-INDICATING
			2			MS26572-1	FUSEHOLDER
			8			MS90078-12-1	FUSE, 3 AMP
			1			MS3127E-24-61PX	CONNECTOR, RECEP. ELEC. CRIMP TYPE
			9			1016024-001	RELAY-ARMATURE
			11			1015802-1	RELAY-ARMATURE
			1			1015833-9	RELAY-THERMAL TIME DELAY
			3			1015914-001	RELAY-ARMATURE
			9			1015837-001	RELAY-ARMATURE
			1			1015833-201	RELAY-THERMAL TIME DELAY
			1			1015869-349	LIGHT-INDICATOR
			1			1015869-151	LIGHT-INDICATOR
			1			1015869-150	LIGHT-INDICATOR
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			20			1900391	BRACKET, CIRCUIT BOARD, SINGLE
			17			1900390	BRACKET, CIRCUIT BOARD, DOUBLE
			1			1015957-188	CONNECTOR, RECEPTACLE, ELEC.
			1			-185	
			3			-184	
			3			-183	
			3			-182	
			3			-181	
			3			-180	
			1			-179	
			2			-178	
			1			-177	
			1			-176	
			1			-175	
			1			1015957-174	CONNECTOR, RECEPTACLE, ELEC.
			1			1015869-520	LIGHT-INDICATOR, SWITCH
			1			-344	
			1			-343	
			1			-342	
			1			-341	
			1			-340	
			1			1015869-339	LIGHT-INDICATOR, SWITCH
			1			1015869-149	LIGHT-INDICATOR
			1			-147	
			1			-146	
			1			-145	
			1			-144	
			1			-143	
			1			-142	
			1			-141	
			1			-140	
			1			-139	
			1			-138	
			1			-137	
			1			-136	
			1			-129	
			1			-128	
			1			-127	
			1			-126	
			1			-125	
			1			-124	
			1			-123	
			1			-122	
			1			-121	
			1			-120	
			1			-119	
			1			-118	
			1			-117	
			1			-116	
			1			-115	
			1			-114	
			1			-113	
			1			-112	
			1			-111	
			1			-110	
			1			1015869-109	LIGHT-INDICATOR
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			1900447-011	FREQUENCY COMPARATOR
			2			1900370-011	WHEEL POWER & CDU MOTOR EXC FAIL SENSOR
			3			1900371-011	ENGINE SEQUENCE START, ENGINE START, OR CUTOFF SENSOR
			3			1900372-011	X, Y, OR Z PIPA SENSOR
			3			1900373-011	IG, MG, OR OG CDU ERROR SENSOR
			3			1900374-011	IMU, ACCEL, OR CDU FAIL SENSOR
			1			1900375-011	IMU TEMP FAIL, MASTER WARNING & MASTER ALARM SENSOR
			3			1900376-011	IG, MG, OR OG SERVO ERROR SENSOR
			1			1900377-011	IMU DELAY & GIMBAL LOCK SENSOR
			1			1900378-011	AGC FAIL, AGC POWER FAIL & ERROR DETECT SENSOR
			1			MS3127E-24-61PW	CONNECTOR, RECEP. ELEC. CRIMP TYPE
			1			MS3127E-24-61P	CONNECTOR, RECEP. ELEC. CRIMP TYPE
			10			1015826-296	SCREW, FLAT HEAD, HEX. SOCKET
			10			1015798-010	NUT, ANCHOR, FLOATING
			1			1015791-010	CHASSIS SLIDE ASSY, LEFT HAND
			1			1015791-009	CHASSIS SLIDE ASSY, RIGHT HAND
			2			1900015-061	HANDLE ASSY
			1			1015944	BATTERY, STORAGE (24V)
			1			MIL-S-8372	BELL, ELECTRICAL (24V) TYPE J-3
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thick DATE 9 APR 63
CHECKED W.D. 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 6/5/63
C. Gedemyn 6/1/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL ASSEMBLY

CODE IDENT NO.
SIZE D
1900055
SCALE
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

H 1900055

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		CHANGE IN ACCORDANCE WITH MXC 187709		1 JUN 63	
B		CHANGE IN ACCORDANCE WITH MXC 188100		19 JUL 63	
C		CHANGE IN ACCORDANCE WITH MXC 188472		5 AUG 63	JGL
D		CHANGE IN ACCORDANCE WITH MXC 188860		21 AUG 63	DKD CJP
E		CHANGE IN ACCORDANCE WITH MXC 189122		9 SEP 63	
F		CHANGE IN ACCORDANCE WITH MXC 189217 PER TDRR 03715		13 SEPT 63	EL
G		CHANGE IN ACCORDANCE WITH MXC-189583		6-NOV-63	JEL EJS
H		REPLACED WITH CHANGE BY REV, "J" PER MXC 190239 REVISED PER TDRR 04414		6 NOV 63	EL EJS

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 04466 DATE

(H) REPLACED WITH CHANGE BY REV "J"

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1			1016085	INDUCTOR
336			1015818-424	SOCKET CONTACTS, CRIMP TYPE
336			1015817-424	PIN CONTACTS, CRIMP TYPE
3			1015817-660	CONNECTOR, RECEPTACLE
3			1015818-500	CONNECTOR, PLUG
3			1015817-500	CONNECTOR, RECEPTACLE
1			1016104	TRANSFORMER
1			1015925-002	FLASHER
1			CS13AC180K	(1896954-181) CAPACITOR
12			1015818-620	CRIMP TYPE SOCKET CONTACTS
12			1015817-620	CRIMP TYPE PIN CONTACTS
3			1015818-660	CONNECTOR-PLUG, ELEC
1			1900419-011	ENCODER EXCITATION FAIL SENSOR
3			1015817-660	CONNECTOR-RECEPTACLE, ELEC
1			1900707-011	VERIFICATION ASSEMBLY
1			1900613-011	ENCODER ZEROING & -28VDC SENSOR
15			IN645	(1896966-004) DIODE
3			IN649	(1896966-006) DIODE
1			1015357-166	CONNECTOR, RECEP, ELECTRICAL
1			1900487-011	3200 CPS VOLTAGE COMPARATOR
1			1900492-011	±28VDC PILOT POWER SUPPLY
4			1015873-001	FUSEHOLDER-INDICATING
2			1015873-008	FUSEHOLDER-INDICATING
2			MS26572-1	FUSEHOLDER
8			MS90078-12-1	FUSE, 3 AMP
1			MS3127E-24-61PX	CONNECTOR, RECEP. ELEC. CRIMP TYPE
9			1016024-001	RELAY-ARMATURE
11			1015802-1	RELAY-ARMATURE
1			1015833-9	RELAY-THERMAL TIME DELAY
3			1015914-001	RELAY-ARMATURE
9			1015837-001	RELAY-ARMATURE
1			1015833-201	RELAY-THERMAL TIME DELAY
1			1015869-349	LIGHT-INDICATOR
1			1015869-151	LIGHT-INDICATOR
1			1015869-150	LIGHT-INDICATOR

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
20			1900391	BRACKET, CIRCUIT BOARD, SINGLE
17			1900390	BRACKET, CIRCUIT BOARD, DOUBLE
1			1015957-188	CONNECTOR, RECEPTACLE, ELEC.
1			-185	
3			-184	
3			-183	
3			-182	
3			-181	
3			-180	
1			-179	
2			-178	
1			-177	
1			-176	
1			-175	
1			1015957-174	CONNECTOR, RECEPTACLE, ELEC.
1			1015869-520	LIGHT-INDICATOR, SWITCH
1			-344	
1			-343	
1			-342	
1			-341	
1			-340	
1			1015869-339	LIGHT-INDICATOR, SWITCH
1			1015869-149	LIGHT-INDICATOR
1			-147	
1			-146	
1			-145	
1			-144	
1			-143	
1			-142	
1			-141	
1			-140	
1			-139	
1			-138	
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1			-136	
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1			-125	
1			-124	
1			-123	
1			-122	
1			-121	
1			-120	
1			-119	
1			-118	
1			-117	
1			-116	
1			-115	
1			-114	
1			-113	
1			-112	
1			-111	
1			-110	
1			1015869-109	LIGHT-INDICATOR

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
1			1900447-011	FREQUENCY COMPARATOR
2			1900370-011	WHEEL POWER & CDU MOTOR EXC FAIL SENSOR
3			1900371-011	ENGINE SEQUENCE START, ENGINE START, OR CUTOFF SENSOR
3			1900372-011	X, Y, OR Z PIPA SENSOR
3			1900373-011	IG, MG, OR OG CDU ERROR SENSOR
3			1900374-011	IMU, ACCEL, OR CDU FAIL SENSOR
1			1900375-011	IMU TEMP FAIL, MASTER WARNING & MASTER ALARM SENSOR
3			1900376-011	IG, MG, OR OG SERVO ERROR SENSOR
1			1900378-011	AGC FAIL, AGC POWER FAIL & ERROR DETECT SENSOR
1			MS3127E-24-61PW	CONNECTOR, RECEP. ELEC. CRIMP TYPE
1			MS3127E-24-61P	CONNECTOR, RECEP. ELEC. CRIMP TYPE
10			1015826-296	SCREW, FLAT HEAD, HEX. SOCKET
10			1015798-010	NUT, ANCHOR, FLOATING
1			1015791-010	CHASSIS SLIDE ASSY, LEFT HAND
1			1015791-009	CHASSIS SLIDE ASSY, RIGHT HAND
2			1900015-061	HANDLE ASSY
1			1015944	BATTERY, STORAGE (24V)
1			MIL-S-8372	BELL, ELECTRICAL (24V) TYPE J-3

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+ —	+ —	+ —
− —	− —	− —

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN W. Thiel DATE 9 APR 63
CHECKED 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 6/5/0
C. Gedemyn 6/1/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL ASSEMBLY

CODE IDENT NO.
SIZE D 1900055
SCALE
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900022

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
J		REPLACES REV. H WITH CHANGE PER MXC-190239 REVISED PER TDR 01714		7-NOV-63 18 SEPT 63	

NOTES:

1: INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

2: MARK WEIGHT OF ASSEMBLY PER ND 1002123 ADJACENT TO NAMEPLATE LOCATION.

3: CHASSIS SLIDE MOUNTING SCREWS, ITEM (80) AND FRONT PANEL MOUNTING SCREWS, ITEM (48) SHALL BE SUBJECTED TO TORQUE OF 37-40 IN.LB AT INSTALLATION.

4: PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010

5: VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING.

6: SOLDER PER MIL-S-6872(ES-2505-1) USING ITEMS (89) & (90).

7: SERIALIZE PER ND 1002023.

8: SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.

9: MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

10: SELECT AS REQUIRED.

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		103	1900783-011	RELAY BRACKET ASSEMBLY, A28
SEE NOTE 5	50		102	1010617-4	NUT, HEX, SELF LOCKING
	50		101	MS-35216-16	SCREW, MACHINE, PAN HD
	1		100	1900780-011	RELAY BRACKET ASSEMBLY, A30
	1		99	1900792-011	RELAY BRACKET ASSEMBLY, A29
	20		98	MS-35216-42	SCREW, MACHINE, PAN HD
	1		97		BELL, ELECTRICAL (24VDC)
	7		96	AN363C832(1896990-281)	NUT, SELF LOCKING
	1		95	CS13AG180K(1896954-181)	CAPACITOR, MIL-C-26655-2
	1		94	MS21919DG-2	CLAMP, CUSHIONED, SUPPORT
	18		93	1900391	BRACKET HOLDER, DOUBLE
	20		92	1900390	BRACKET HOLDER, SINGLE
	1		91	1900558	DRAWER, MONITOR PANEL (INSEP)
	AR		90	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		89	MIL-F-14256, QQ-S-571	FLUX (ES-2798) TYPE AR (ES-2175)
	10		88	1016005-1	SHIM, SLIDE LOCATING
	1		87	MS35431-3	TERMINAL LUG
SEE NOTE 10	4EA		86	MS21919-DG11 THRU 15	CLAMP, CUSHIONED, SUPPORT
	1		85		NAMEPLATE
	12		84	MS-35216-26	SCREW, MACHINE, PAN HD
	1		83	1900856	WIRE LIST BB
	1		82	1900852	WIRING HARNESS B
	1		81	1900196	WIRING HARNESS A
	10		80	1015826-296	SCREW, FLAT HEAD, HEX SOCKET
SEE NOTE 5	1		79	1015791-009	SLIDE ASSY, QUICK RELEASE, R.H.
SEE NOTE 5	1		78	1015791-010	SLIDE ASSY, QUICK RELEASE, L.H.
SEE NOTE 5	1		77	1016104	TRANSFORMER
			76	AN363C632(1896990-261)	NUT, SELF LOCKING
SEE NOTE 5	1		75	1016085	REACTOR
	4		74	MS-35217-69	SCREW, PAN HD
	4		73	AN363C428(1896990-041)	NUT, SELF LOCKING
SEE NOTE 5	1		72	1015944-001	BATTERY, STORAGE-24VOLT
	1		71	1900447-011	3200CPS FREQUENCY COMPARATOR
	76		70	MS35333-71	WASHER, LOCK, FLAT, INTERNAL TOOTH
	1		69	1900492-011	PILOT POWER SUPPLY, ±28VDC
	1		68	1900487-011	VOLTAGE COMPARATOR, 2 VOLT, 3200 CPS
	1		67	1900707-011	VERIFICATION ASSEMBLY
	1		66	1900613-011	ENCODER ZEROING & -28VDC SENSOR
	2		65	1900370-011	WHEEL POWER & CDU MOTOR EXCITATION FAILURE SENSOR
	3		64	1900371-011	ENGINE ON, THRUST COMMAND AND THRUST OFF ASSEMBLY
	3		63	1900376-011	IG, MG OR OG SERVO ERROR SENSOR
	2		62	MS-90078-15-1(1897077-115)	FUSE
	3		61	1900374-011	IMU, ACCEL OR CDU FAIL SENSOR
	3		60	1900372-011	PIPA SENSOR
	1		59	1900419-011	ENCODER EXCITATION FAILURE SENSOR ASSEMBLY
	3		58	1900373-011	IG, MG OR OG CDU ERROR SENSOR
	1		57	1900378-011	AGC SPARE, AGC POWER FAIL, ERROR DETECT & IMU DELAY SENSOR
	1		56	1900375-011	IMU TEMP. FAIL, MASTER WARNING & MASTER ALARM SENSOR
	78		55	MS-35216-27	SCREW, MACHINE, PAN HD
	1		54	1900793	BRACKET-CONNECTOR (INSEP) ASSY
SEE NOTE 5	4		53	1015873-001	FUSEHOLDER-INDICATING
	2		52	MS-26572-1	FUSEHOLDER
SEE NOTE 5	2		51	1015873-008	FUSEHOLDER-INDICATING
	6		50	MS-90078-12-1(1897077-112)	FUSE
	6		49	AN363C1032(1896990-011)	NUT, SELF LOCKING
SEE NOTE 5	6		48	1006783-45	SCREW, BUTTON HD, HEX SOCK
	1		47	1015869-339	LIGHT-INDICATOR & SWITCH ASSY
	1		46	1015869-520	LIGHT INDICATOR & SWITCH ASSY
	1		45	1015869-147	LIGHT-INDICATOR & SWITCH ASSY
	1		44	1015869-341	LIGHT-INDICATOR & SWITCH ASSY
	3		43	1015869-151	LIGHT-INDICATOR & SWITCH ASSY
	1		42	1015869-150	LIGHT-INDICATOR & SWITCH ASSY
	1		41	1015869-129	LIGHT-INDICATOR & SWITCH ASSY
	1		40	1015869-128	LIGHT-INDICATOR & SWITCH ASSY
	1		39	1015869-127	LIGHT-INDICATOR & SWITCH ASSY
	1		38	1015869-126	LIGHT-INDICATOR & SWITCH ASSY
	1		37	1015869-340	LIGHT INDICATOR & SWITCH ASSY
	1		36	1015869-342	LIGHT INDICATOR & SWITCH ASSY
SEE NOTE 5	1		35	1015869-344	LIGHT INDICATOR & SWITCH ASSY
	1		34	1015869-349	LIGHT INDICATOR & SWITCH ASSY
	1		33	1015869-343	LIGHT INDICATOR & SWITCH ASSY
	1		32	1015869-125	LIGHT INDICATOR & SWITCH ASSY
	1		31	1015869-124	LIGHT INDICATOR & SWITCH ASSY
	1		30	1015869-123	LIGHT INDICATOR & SWITCH ASSY
	1		29	1015869-122	LIGHT INDICATOR & SWITCH ASSY
	1		28	1015869-121	LIGHT INDICATOR & SWITCH ASSY
	1		27	1015869-149	LIGHT INDICATOR & SWITCH ASSY
	1		26	1015869-146	LIGHT INDICATOR & SWITCH ASSY
	1		25	1015869-145	LIGHT INDICATOR & SWITCH ASSY
	1		24	1015869-144	LIGHT INDICATOR & SWITCH ASSY
	1		23	1015869-143	LIGHT INDICATOR & SWITCH ASSY
	1		22	1015869-142	LIGHT INDICATOR & SWITCH ASSY
	1		21	1015869-119	LIGHT INDICATOR & SWITCH ASSY
	1		20	1015869-118	LIGHT INDICATOR & SWITCH ASSY
	1		19	1015869-117	LIGHT INDICATOR & SWITCH ASSY
	1		18	1015869-120	LIGHT INDICATOR & SWITCH ASSY
	1		17	1015869-116	LIGHT INDICATOR & SWITCH ASSY
	1		16	1015869-115	LIGHT INDICATOR & SWITCH ASSY
	1		15	1015869-141	LIGHT INDICATOR & SWITCH ASSY
	1		14	1015869-140	LIGHT INDICATOR & SWITCH ASSY
	1		13	1015869-139	LIGHT INDICATOR & SWITCH ASSY
	1		12	1015869-138	LIGHT INDICATOR & SWITCH ASSY
	1		11	1015869-137	LIGHT INDICATOR & SWITCH ASSY
	1		10	1015869-136	LIGHT INDICATOR & SWITCH ASSY
	1		9	1015869-114	LIGHT INDICATOR & SWITCH ASSY
	1		8	1015869-113	LIGHT INDICATOR & SWITCH ASSY
	1		7	1015869-112	LIGHT INDICATOR & SWITCH ASSY
	1		6	1015869-111	LIGHT INDICATOR & SWITCH ASSY
	1		5	1015869-110	LIGHT INDICATOR & SWITCH ASSY
	1		4	1015869-109	LIGHT INDICATOR & SWITCH ASSY
	8		3	1015831-257	SCREW, FLAT HD 100° HEX SOCKET
	2		2	1900015-061	HANDLE ASSEMBLY
	1		1	1900499	PANEL, FRONT

LIST OF PARTS AND MATERIALS / LIST OF MATERIALS OR PARTS LIST

QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

(J) REPLACES REV "H" WITH CHANGE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01466 DATE 5 June 63

✓	✓	✓
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004-011	1900004-011	-011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN FRIEDE DATE 4 SEPT 63
CHECKED W. Dicke 11 Sep 63
APPROVAL 17 SEP 63
APPROVAL Johnson 11/11/63
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

MONITOR PANEL
ASSEMBLY

CODE IDENT NO. SIZE E 1900055
SCALE FULL SHEET 1 OF 3

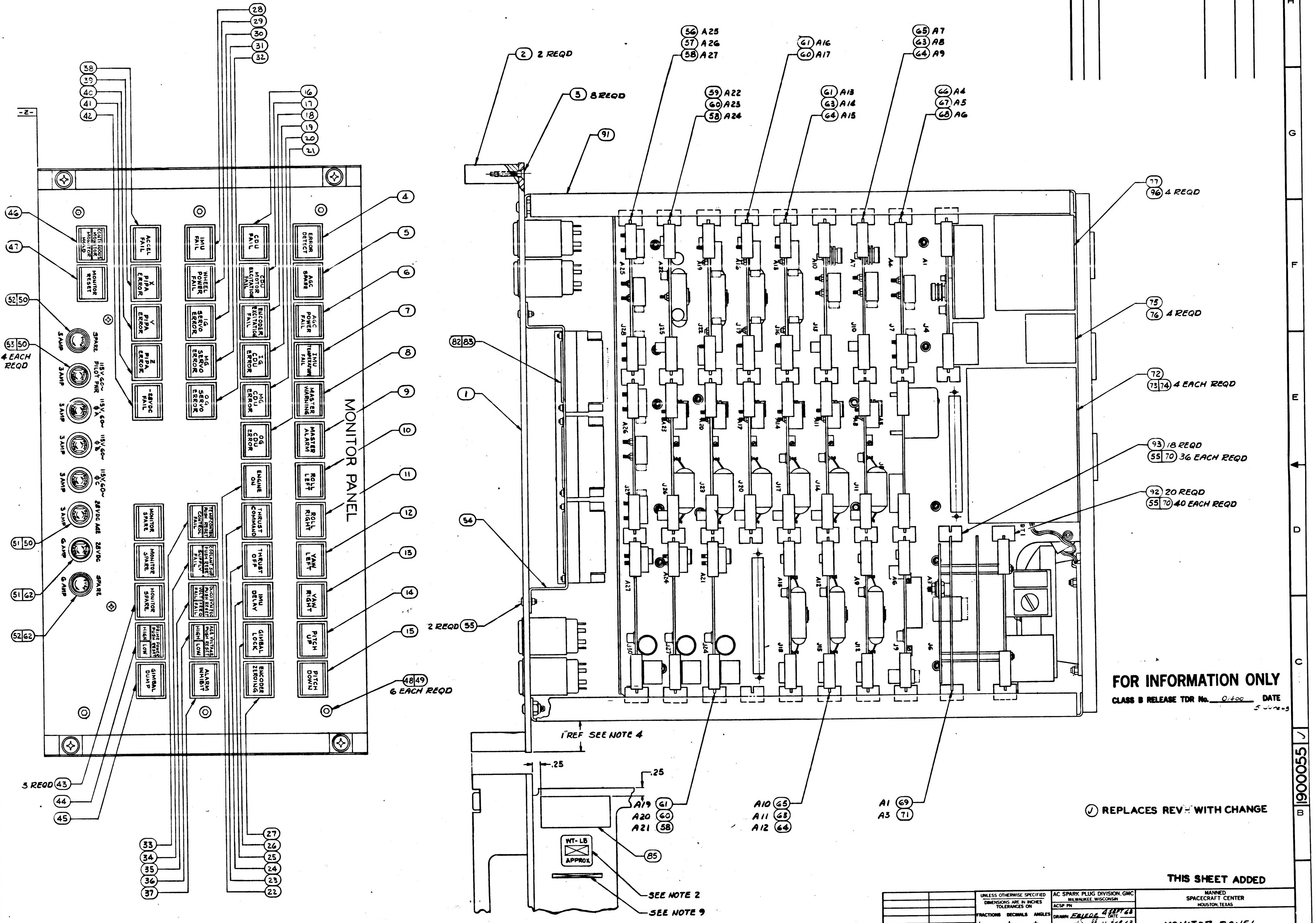
1900055 J

1900055 SHT 1 OF 3

MIL 1051E D 11.19.62

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
J		REPLACES REV. "H" WITH CHANGE PER MXC-190239 REVISED PER TDR 04714		-33	JEL



MONITOR PANEL
CONTINUOUS MONITOR / MONITOR HOLD
MONITOR RESET
ACCEL FAIL
X PIPA ERROR
Y PIPA ERROR
Z PIPA ERROR
-28VDC FAIL
IMU FAIL
WHEEL POWER FAIL
IG SERVO ERROR
MG SERVO ERROR
OG SERVO ERROR
CDU FAIL
CDU MOTOR EXCITATION FAIL
ENCODER EXCITATION FAIL
IG CDU ERROR
MG CDU ERROR
OG CDU ERROR
ENGINE ON
THRUST COMMAND
THRUST OFF
IMU DELAY
GIMBAL LOCK
ENCODER ZEROING
ERROR DETECT
AGC SPARE
AGC POWER FAIL
IMU TEMPERATURE FAIL
MASTER WARNING
MASTER ALARM
ROLL LEFT
ROLL RIGHT
YAW LEFT
YAW RIGHT
PITCH UP
PITCH DOWN
MONITOR SPARE
MONITOR SPARE
MONITOR SPARE
PRIME POWER PUSH RESET HIGH LOW
GIMBAL DUMP
TEMP CONTROL PUSH RESET CONTROL FAIL
COOLANT SUP PUSH RESET SUPPLY FAIL
DUCOSYN EXC PUSH RESET VOLT FAIL FREQ FAIL
AGE VOLTAGE PUSH RESET HIGH LOW
ALARM INHIBIT
SPARE 3 AMP
115V, 60~ PILOT PWR 3 AMP
115V, 60~ ΦA 3 AMP
115V, 60~ ΦB 3 AMP
115V, 60~ ΦC 3 AMP
28VDC AGE 3 AMP
28VDC 6 AMP
SPARE 6 AMP
-Z-
46
47
52 50
53 50 4 EACH REQD
51 50
51 62
52 62
3 REQD 43
44
45
38
39
40
41
42
28
29
30
31
32
16
17
18
19
20
21
4
5
6
7
8
9
10
11
12
13
14
15
48 49 6 EACH REQD
33
34
35
36
37
27
26
25
24
23
22
2 2 REQD
3 8 REQD
91
56 A25
57 A26
58 A27
59 A22
60 A23
58 A24
61 A16
60 A17
61 A13
63 A14
64 A15
65 A7
63 A8
64 A9
66 A4
67 A5
68 A6
77
96 4 REQD
75
76 4 REQD
72
73 74 4 EACH REQD
93 18 REQD
55 70 36 EACH REQD
92 20 REQD
55 70 40 EACH REQD
82 83
1
54
2 REQD 55
1" REF SEE NOTE 4
.25
.25
A19 61
A20 60
A21 58
A10 65
A11 63
A12 64
A1 69
A3 71
85
WT-LB APPROX
SEE NOTE 2
SEE NOTE 9
A25 A22 A19 A16 A13 A10 A7 A4 A1
J28 J25 J22 J19 J16 J13 J10 J7 J4
A26 A23 A20 A17 A14 A11 A8 A5 A2
J29 J26 J23 J20 J17 J14 J11 J8
A27 A24 A21 A18 A12 A9 A6 A3
J30 J27 J24 J21 J18 J15 J12 J9 J6

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01400 DATE 5 June 63

Ⓙ REPLACES REV H WITH CHANGE

THIS SHEET ADDED

1900004-011 | 1900004-011 NEXT ASSY | USED ON APPLICATION	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± — DO NOT SCALE THIS DRAWING MATERIAL CONTRACT NAS 9-497	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN DRAWN FRIEDE DATE 4 SEPT 63 CHECKED W. Diehl 11 SEP 63 APPROVAL W. Williams 17 SEP 63 APPROVAL NASA APPROVAL MIT APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS MONITOR PANEL ASSEMBLY CODE IDENT NO. SCALE FULL	SIZE E 1900055 SHEET 3 OF 3

1900055 J

1800022 SH 3

1900055

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. a466 **DATE**

			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			MS3127E-24-61PW	CONNECTOR, RECEP. ELEC. CRIMP TYPE
			1			MS3127E-24-61P	CONNECTOR, RECEP. ELEC. CRIMP TYPE
			10			1015826-296	SCREW, FLAT HEAD, HEX. SOCKET
			10			1015798-010	NUT, ANCHOR, FLOATING
			1			1015791-010	CHASSIS SLIDE ASSY, LEFT HAND
			1			1015791-009	CHASSIS SLIDE ASSY, RIGHT HAND
			2			1900015-061	HANDLE ASSY
			1			1015944	BATTERY, STORAGE (24V)
			1			MIL-S-8372	BELL, ELECTRICAL (24V) TYPE J-3
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + — − — DECIMALS + — − — ANGLES + — − —
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Thiel DATE 9 APR 63
CHECKED [illegible] 10 APR 63
APPROVAL [illegible] 10 APR 63
APPROVAL [illegible] 10 APR 63
NASA APPROVAL [illegible] 6/5/0
C. Gedurman 6/3/63
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

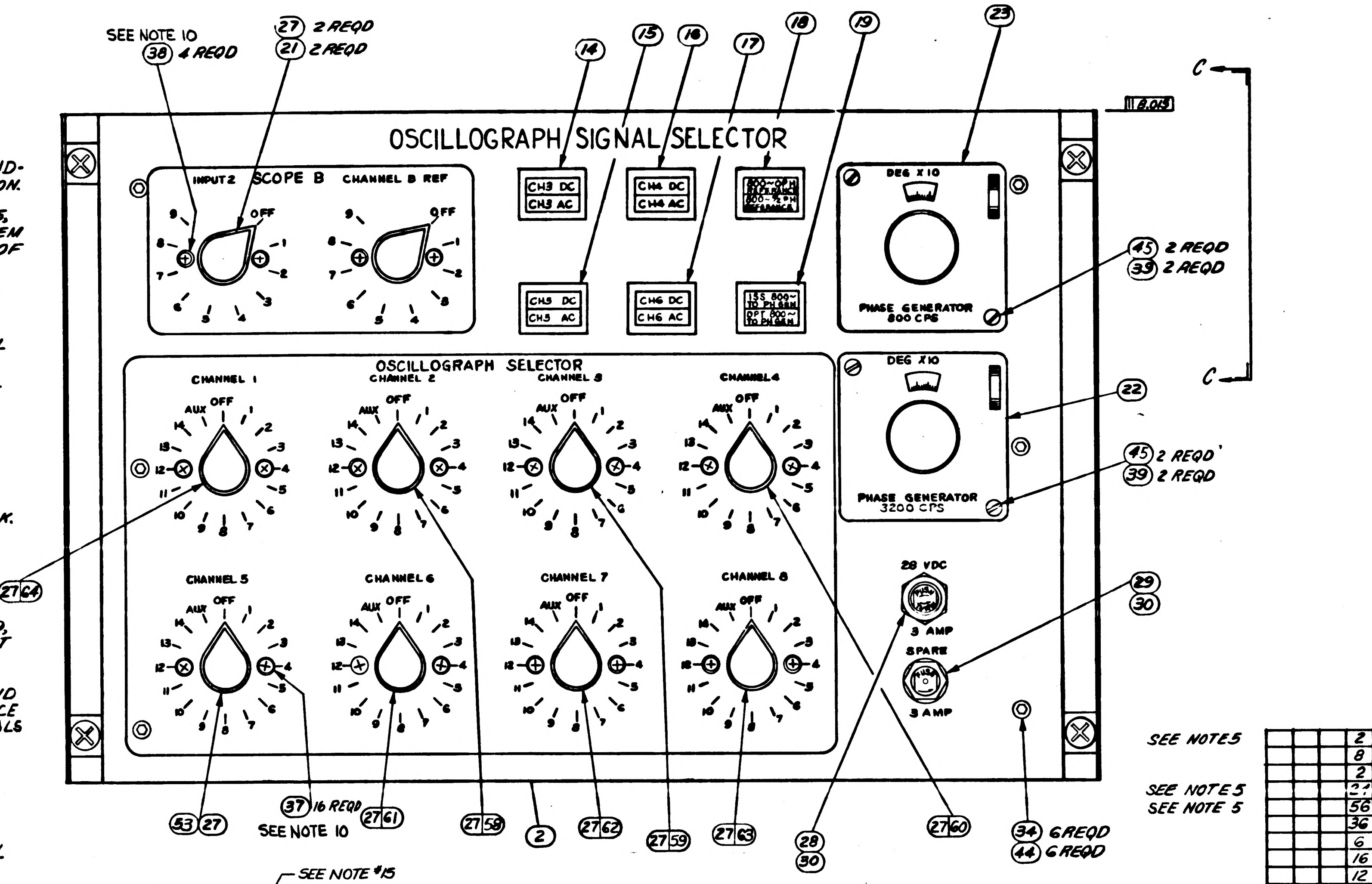
MONITOR PANEL
ASSEMBLY

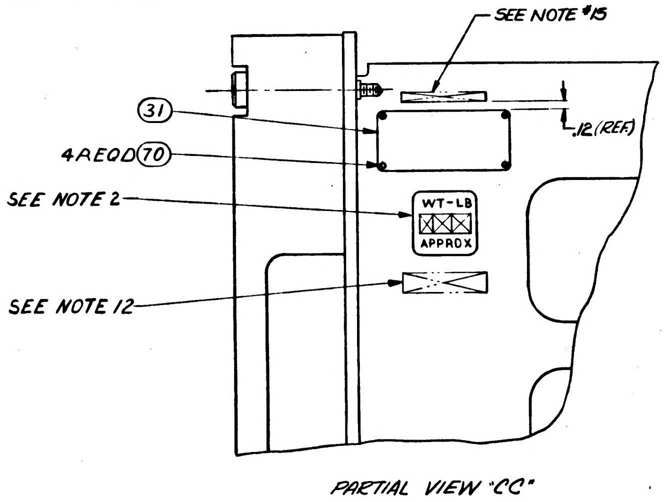
CODE IDENT NO.
SIZE D
1900055
SCALE
SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
2. MARK WEIGHT OF ASSEMBLY (50 LBS) PER ND-1002123 ADJACENT TO NAMEPLATE LOCATION.
3. CHASSIS SLIDE MOUNTING SCREWS, ITEM 35, AND FRONT PANEL MOUNTING SCREWS, ITEM 34, SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.
4. DIMENSION A SHALL BE EQUAL TO DIMENSION B WITHIN .040 IN.
5. VENDOR ITEM-SEE SPECIFICATION CONTROL DRAWING.
6. ASSEMBLE RELAYS, ITEM 47, WITH RED DOT IN POSITION SHOWN-24 PLACES.
7. SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM 55 AND 56.
8. SELECT AS REQUIRED.
9. SHIM TO FIT PEEL OFF EXCESS SHIM STOCK.
10. SECURE ITEMS 37 AND 38 USING ITEM 54.
11.
12. MARK "SCHEM " AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND-1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
13. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER ON ITEM 31 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
14. SECURE SCREWS USING ITEM (73).
15. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND-1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.





PARTIAL VIEW "CC"

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
T		REPLACES REV. S WITH CHANGE PER MXC 191622 REVISED PER TDR		23 DEC 63	RD JEL
U		CHANGE IN ACCORDANCE WITH CM 193006 PER TORR 07672		9 JAN	GM JF
V		CHANGE IN ACCORDANCE WITH CM 192214 PER TORR 07673		10 JAN	GM F
W		CHANGE IN ACCORDANCE WITH CM 194148 PER TORR 07676		64	F
Y		CHANGE IN ACCORDANCE WITH CM 19567 PER TORR 09710		2 APR 64	EF
Z		CHANGE IN ACCORDANCE WITH CM 19592 PER TORR 09710		29 APR 64	RB
AA		CHANGE IN ACCORDANCE WITH CM 195962 PER TORR 09711		MAY 64	RS MEM

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 6 MAY 63

	011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		78	MS21919DG 5 THRU 6	(1897073-105 THRU 106) CLAMP
	1		77	MS21919DG 3 THRU 4	(1897073-103 THRU 104) CLAMP
	2		76	MS21919DG 21 THRU 23	(1897073-121 THRU 123) CLAMP
	2		75	MS21919DG 19 THRU 21	(1897073-119 THRU 121) CLAMP
	2		74	MS21919DG 17 THRU 19	(1897073-117 THRU 119) CLAMP
	AR		73	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
	4		72	MS35333-71	WASHER, LOCK, INT. T.
	6		71	AN960-C6	(1897006-026) WASHER, FLAT
	4		70	AN535-00-4	(1897109-004) SCREW, DRIVE, ROUND HEAD
	1		69	1900864	BRKT, REL & CONN (INSEP ASSY)
	2		68	1900863	BRACKET, SUPPORT
	2		67	AN363C832	(1896990-281) NUT-HEX
	1		66	1900648	ELEC SCHEM-OSCILLOGRAPH SIG SEL
	X		65	ATP-1900056	SPECIFICATIONS
	1		64	1900490-011	
	1		63	1900490-081	
	1		62	1900490-071	
	1		61	1900490-061	
	1		60	1900490-041	
	1		59	1900490-031	
	1		58	1900490-021	SWITCH AND CONNECTOR ASSY
SEE NOTE 9	10		57	1016005-1	SHIM, SLIDE, LOCATING
	AR		56	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
	AR		55	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		54	MIL-S-40083 (ORD) CL 20	SEALING & RETAINING COMP (ES-2554-3)
	1		53	1900490-051	SWITCH & CONNECTOR ASSY
	1		52	1900394	WIRING HARNESS B
	1		51	1900097	WIRING HARNESS A
SEE NOTE 5	2		50	1015842	TRANSFORMER
	8		49	AN500AD4-7	(1897012-425) SCREW, MACHINE FIL HD
	2		48	MS35216-27	SCREW, MACHINE, PAN HD
SEE NOTE 5	24		47	1015802-004	RELAY ARMATURE
SEE NOTE 5	56		46	1016151-004	NUT-SELF-LOCKING
	36		45	AN363C632	(1896990-261) NUT-SELF-LOCKING
	6		44	AN363C1032	(1896990-011) NUT-SELF-LOCKING
	16		43	MS35216-45	SCREW, MACHINE, PAN HD
	12		42	MS35216-42	SCREW, MACHINE, PAN HD
	6		41	MS35216-41	SCREW, MACHINE, PAN HD
	32		40	MS35216-26	SCREW, MACHINE, PAN HD
	4		39	MS35216-32	SCREW, MACHINE, PAN HD
	8		38	AN507C632 R6	(1897003-534) SCREW, MACHINE, FLAT HD, 100°
	16		37	AN507C832 R6	(1897003-564) SCREW, MACHINE, FLAT HD, 100°
SEE NOTES 5	8		36	1015831-253	SCREW, FLAT HD 100° (HEX SOC)
SEE NOTES 5	10		35	1015826-304	SCREW, FLAT HD (HEX SOC)
SEE NOTES 5	6		34	1006783-45	SCREW, BUTTON HD, HEX SOC
SEE NOTES 5	16		33	1015860-007	SPACER
SEE NOTE 8			32		
	1		31	1901304-120	NAMEPLATE, APOLLO, GEN
	2		30	MS90078-12-1	(1897077-112) FUSE
	1		29	MS26572-1	FUSEHOLDER-CARTRIDGE
	1		28	1015873-008	FUSEHOLDER-(LIGHT IND TYPE)
	10		27	MS91528-2K2B	(1897080-023) KNOB, CONTROL
	2		26	1900015-071	HANDLE ASSY
SEE NOTES 5	1		25	1015791-010	SLIDE ASSY QUICK RELEASE
SEE NOTES 5	1		24	1015791-009	SLIDE ASSY QUICK RELEASE
SEE NOTES 5	1		23	1015820	PHASE GENERATOR 800 CPS
SEE NOTES 5	1		22	1015821	PHASE GENERATOR 3200 CPS
SEE NOTES 5	2		21	1015825-4	SWITCH ROTARY
	4		20	1015981-003	STAND-OFF, HEX
SEE NOTES 5	1		19	1015869-803	LIGHT INDICATOR ASSY
SEE NOTES 5	1		18	1015869-804	LIGHT INDICATOR ASSY
SEE NOTES 5	1		17	1015869-516	LIGHT INDICATOR ASSY
SEE NOTE 5	1		16	1015869-514	LIGHT INDICATOR ASSY
SEE NOTE 5	1		15	1015869-515	LIGHT-INDICATOR ASSY
SEE NOTE 5	1		14	1015869-513	LIGHT-INDICATOR ASSY
	1		13	1900194	PLATE
	2		12	1900191	BRACKET, AMPL (INSEP ASSY)
	1		11	1900190	BRACKET, AMPL (INSEP ASSY)
	1		10	1900189	BRACKET, AMPL (INSEP ASSY)
	24		9	AN526C832 R7	(1897083-757) SCREW, MACHINE, TRUSS HD
	2		8	1900181-011	BUFFER AMPL 800 CPS LO° ASSY
	2		7	1900138-011	BUFFER AMPLIFIER ASSY
	1		6	1900132-011	BUFFER AMPLIFIER ASSY
	1		5	1900140-011	BUFFER AMPL ASSY 3200 CPS
			4		
			3		
	1		2	1900188	PANEL, FRONT
	1		1	1900199	DRAWER, SEL, SIG, OSCILLOGRAPH

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

AA	AA
Z	Z
Y	W
W	W
V	V
U	T
T	T
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

Ⓣ REPLACES REV "S" WITH CHANGE

1900004	1900004
NEXT ASSY	USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Wunderlich DATE 9 APR 63
CHECKED Zaulen JUL 63
APPROVAL Farley 2 JUL 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

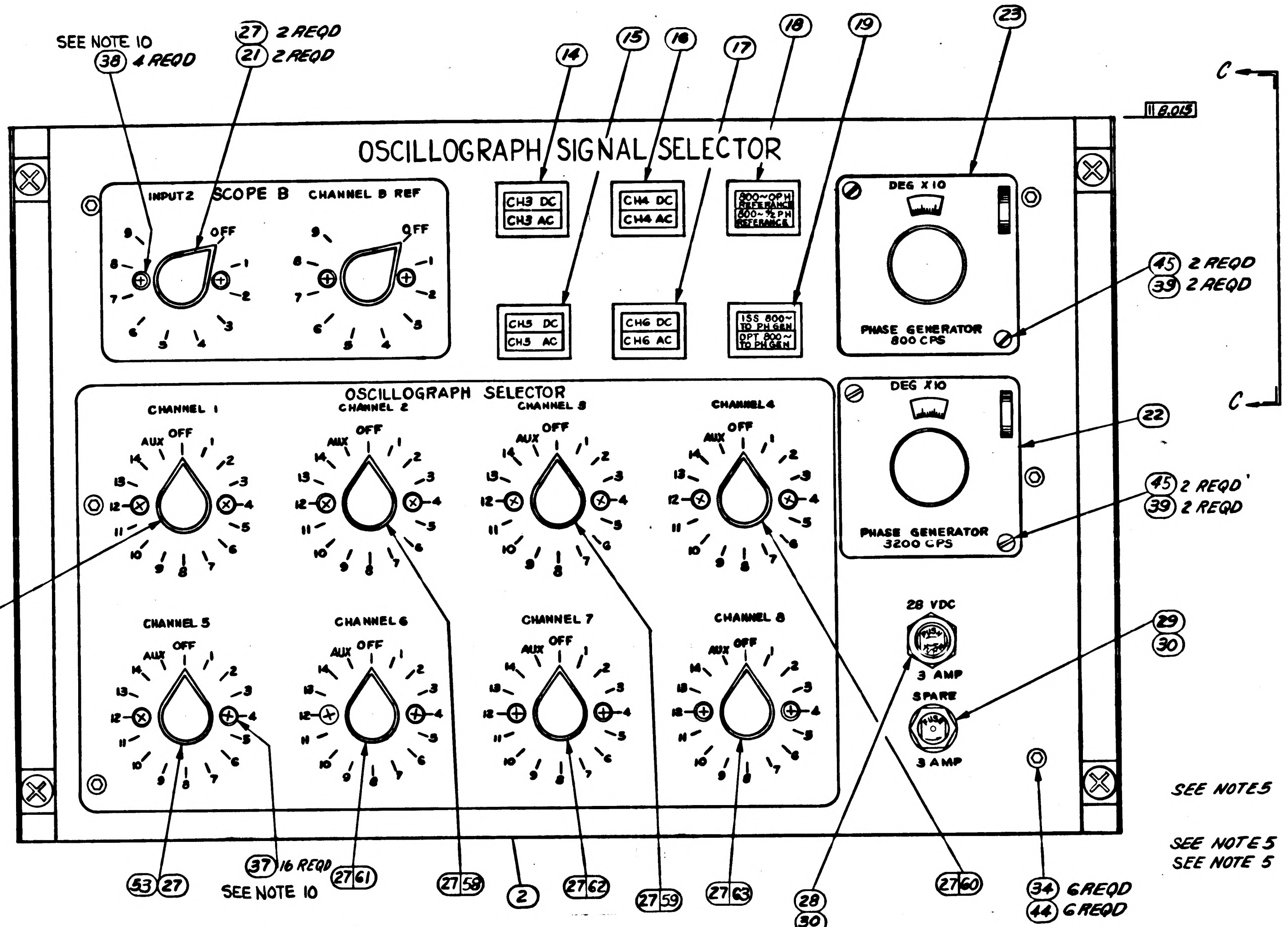
SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY

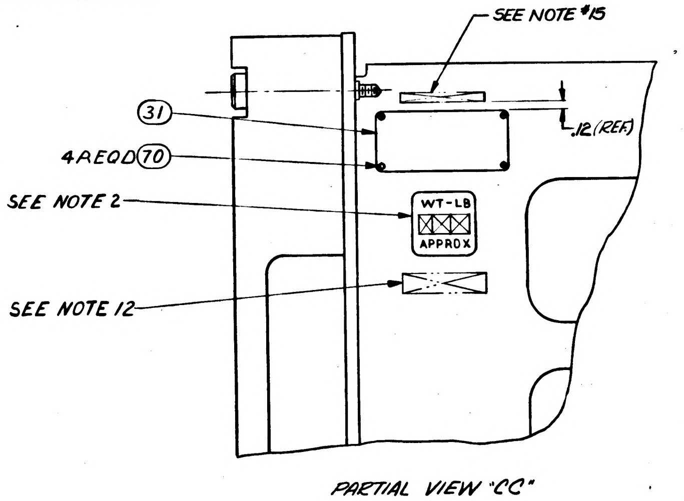
CODE IDENT NO. SIZE E 1900056
SCALE FULL SHEET 1 OF 2

AH 1900056

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
2. MARK WEIGHT OF ASSEMBLY (50 LBS) PER ND-1002123 ADJACENT TO NAMEPLATE LOCATION.
3. CHASSIS SLIDE MOUNTING SCREWS, ITEM 35, AND FRONT PANEL MOUNTING SCREWS, ITEM 34, SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.
4. DIMENSION A SHALL BE EQUAL TO DIMENSION B WITHIN .040 IN.
5. VENDOR ITEM-SEE SPECIFICATION CONTROL DRAWING.
6. ASSEMBLE RELAYS, ITEM 47, WITH RED DOT IN POSITION SHOWN-24 PLACES.
7. SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM 55 AND 56.
8. SELECT AS REQUIRED.
9. SHIM TO FIT PEEL OFF EXCESS SHIM STOCK.
10. SECURE ITEMS 37 AND 38 USING ITEM 54.
11.
12. MARK "SCHEM " AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND-1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
13. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER ON ITEM 31 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
14. SECURE SCREWS USING ITEM (73).
15. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND-1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.





PARTIAL VIEW "CC"

SEE NOTE 9

Note	Qty (011)	Item No.	Part or Identifying Number	Nomenclature or Description
	1	78	MS21919DG 5 THRU 6	(1897073-105 THRU 106) CLAMP
	1	77	MS21919DG 3 THRU 4	(1897073-103 THRU 104) CLAMP
	2	76	MS21919DG 21 THRU 23	(1897073-121 THRU 123) CLAMP
	2	75	MS21919DG 19 THRU 21	(1897073-119 THRU 121) CLAMP
	2	74	MS21919DG 17 THRU 19	(1897073-117 THRU 119) CLAMP
	AR	73	MIL-S-40083-C130	(ES-[illegible]) SEALING COMPOUND
	4	72	MS35333-71	WASHER LO[illegible]VT. T.
	6	71	AN960-C6	(1897006-0[illegible] R, FLAT
	4	70	AN535-00-4	(1897109-00[illegible] SCREW, DRIVE, ROUND HEAD
	1	69	1900864	BRKT, REL & CONN (INSEP ASSY)
	2	68	1900863	BRACKET, SUPPORT
	2	67	AN363C832	(1896990-281) NUT-HEX
	1	66	1900648	ELEC SCHEM-OSCILLOGRAPH SIG SEL
	X	65	ATP-1900056	SPECIFICATIONS
	1	64	1900490-011	↑
	1	63	1900490-081	↑
	1	62	1900490-071	↑
	1	61	1900490-061	↑
	1	60	1900490-041	↑
	1	59	1900490-031	↑
	1	58	1900490-021	SWITCH AND CONNECTOR ASSY
SEE NOTE 9	10	57	1016005-1	SHIM, SLIDE, LOCATING
	AR	56	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
	AR	55	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR	54	MIL-S-40083 (ORD) CL20	SEALING & RETAINING COMP (ES-2554-3)
	1	53	1900490-051	SWITCH & CONNECTOR ASSY
	1	52	1900394	WIRING HARNESS B
	1	51	1900097	WIRING HARNESS A

QUANTITY REQUIRED — EFFECTIVITY — LIST OF PARTS AND MATERIALS

AB	AA
AA	AA
Z	Z
Y	W
W	W
V	V
U	T
T	T
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

Ⓣ REPLACES REV "S" WITH CHANGE

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
T		REPLACES REV. "S" WITH CHANGE PER MXC 191622 REVISED PER TDR		23 DEC 63	RD JEL
U		CHANGE IN ACCORDANCE WITH CM 193006 PER TDRR 07672		9 JAN	GM
V		CHANGE IN ACCORDANCE WITH CM 192214 PER TDRR 07673		10 JAN	GM
Ⓜ W		CHANGE IN ACCORDANCE WITH CM 194148 PER TDRR 07676			
Y		CHANGE IN ACCORDANCE WITH CM 195167 PER TDRR 09710		2 APR 64	
Z		CHANGE IN ACCORDANCE WITH CM 95192 PER TDRR 09710		29 APR 64	RB
Ⓜ AA		CHANGE IN ACCORDANCE WITH CM 195962 PER TDRR 09711		11 MAY 64	RS
AB		REVISED PER TDRR 10873		20 JUN 64	

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01210 DATE 8 MAY 63

Note	Qty (011)	Item No.	Part or Identifying Number	Nomenclature or Description
SEE NOTE 5	2	50	1015842	TRANSFORMER
	8	49	AN500AD4-7	(1897012-425) SCREW, MACHINE FIL HD
	2	48	MS35216-27	SCREW, MACHINE, PAN HD
SEE NOTE 5	24	47	[illegible]	RELAY, ARMATURE
SEE NOTE 5	56	46	1016151-004	NUT-SELF-LOCKING
	36	45	AN363C632	(1896990-261) NUT-SELF-LOCKING
	6	44	AN363C1032	(1896990-011) NUT-SELF-LOCKING
	16	43	MS35216-45	SCREW, MACHINE, PAN HD
	12	42	MS35216-42	SCREW, MACHINE, PAN HD
	6	41	MS35216-41	SCREW, MACHINE, PAN HD
	32	40	MS35216-26	SCREW, MACHINE, PAN HD
	4	39	MS35216-32	SCREW, MACHINE, PAN HD
	8	38	AN501C632 R6	(1897003-534) SCREW, MACHINE, FLAT HD, 100°
	16	37	AN507C832 R6	(1897003-564) SCREW, MACHINE, FLAT HD, 100°
(AB) SEE NOTE 5	8	36	AN507C832 R12	(1897003-568) SCREW, FLAT HD. 100°
SEE NOTE 5	10	35	1015826-304	SCREW, FLAT HD (HEX SOC)
SEE NOTE 5	6	34	1006783-45	SCREW, BUTTON HD, HEX SOC
SEE NOTE 5	16	33	1015860-007	SPACER
SEE NOTE 8		32		
	1	31	1901304-120	NAMEPLATE, APOLLO, GEN
	2	30	MS90078-12-1	(1897077-112) FUSE
	1	29	MS26572-1	FUSEHOLDER-CARTRIDGE
	1	28	1015873-008	FUSEHOLDER-(LIGHT IND TYPE)
	10	27	MS91528-2K2B	(1897080-023) KNOB, CONTROL
	2	26	1900015-071	HANDLE ASSY
SEE NOTE 5	1	25	1015791-010	SLIDE ASSY QUICK RELEASE
SEE NOTE 5	1	24	1015791-009	SLIDE ASSY QUICK RELEASE
SEE NOTE 5	1	23	1015820	PHASE GENERATOR 800 CPS
SEE NOTE 5	1	22	1015821	PHASE GENERATOR 3200 CPS
SEE NOTE 5	2	21	1015825-4	SWITCH ROTARY
	4	20	1015981-003	STAND-OFF, HEX
SEE NOTE 5	1	19	1015869-803	LIGHT INDICATOR ASSY
SEE NOTE 5	1	18	1015869-804	LIGHT INDICATOR ASSY
SEE NOTE 5	1	17	1015869-516	LIGHT INDICATOR ASSY
SEE NOTE 5	1	16	1015869-514	LIGHT INDICATOR ASSY
SEE NOTE 5	1	15	1015869-515	LIGHT-INDICATOR ASSY
SEE NOTE 5	1	14	1015869-513	LIGHT-INDICATOR ASSY
	1	13	1900194	PLATE
	2	12	1900191	BRACKET, AMPL (INSEP ASSY)
	1	11	1900190	BRACKET, AMPL (INSEP ASSY)
	1	10	1900189	BRACKET, AMPL (INSEP ASSY)
	24	9	AN526C832 R7	(1897083-757) SCREW, MACHINE, TRUSS HD
	2	8	1900181-011	BUFFER AMPL 800 CPS LO° ASSY
	2	7	1900138-011	BUFFER AMPLIFIER ASSY
	1	6	1900132-011	BUFFER AMPLIFIER ASSY
	1	5	1900140-011	BUFFER AMPL ASSY 3200 CPS
		4		
		3		
	1	2	1900188	PANEL, FRONT
	1	1	1900199	DRAWER, SEL, SIG, OSCILLOGRAPH

QUANTITY REQUIRED — EFFECTIVITY — LIST OF PARTS AND MATERIALS

1900056 AB

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-477

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Kunderlich DATE 9 APR 63
CHECKED Zeelen JUL 63
APPROVAL Farley A. S. 2 Jul 63
APPROVAL W. Johnson 3/26/64
NASA APPROVAL 4/7/64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900056
SCALE FULL
SHEET 1 OF 2

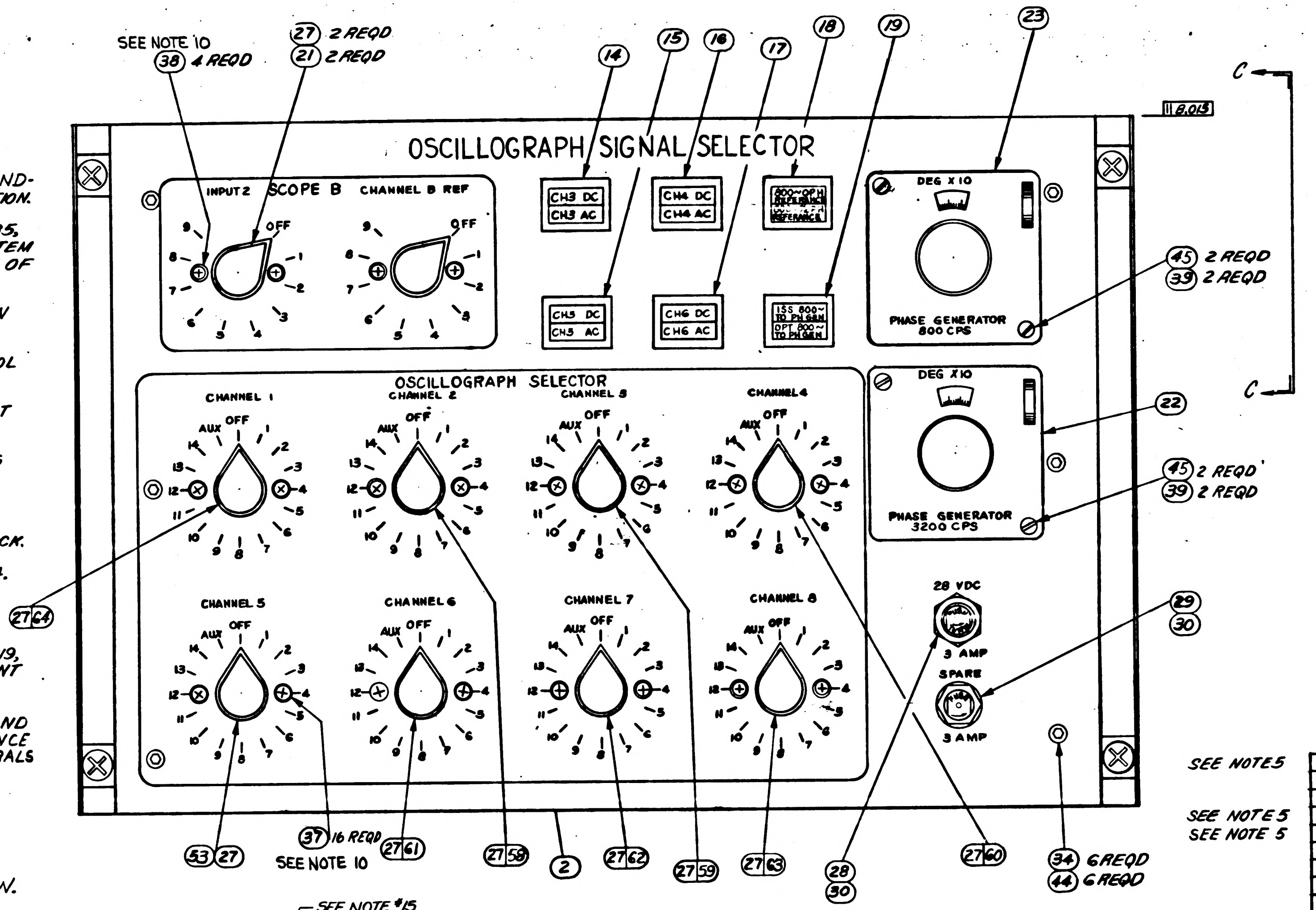
REVISIONS

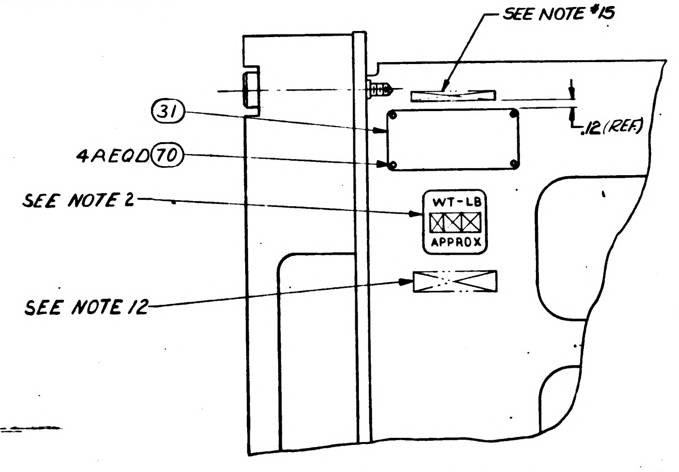
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
T		REPLACES REV. S WITH CHANGE PER MXC 181622 REVISED PER TDR		23 DEC 63	RD JEL
U		CHANGE IN ACCORDANCE WITH CM 193006 PER TDRR 07472		9 JAN 64 3-7-64	GM JF WK
V		CHANGE IN ACCORDANCE WITH CM 192214 PER TDRR 07473		10 JAN 64 3-7-64	GM JF WK
W		CHANGE IN ACCORDANCE WITH CM 194148 PER TDRR 07474		28 JAN 64 4-7-64	JF WK
Y		CHANGE IN ACCORDANCE WITH CM 195167 PER TDRR 09710		21 APR 64	NC EF
Z		CHANGE IN ACCORDANCE WITH CM 195192 PER TDRR 09710		29 APR 64	RB
AA		CHANGE IN ACCORDANCE WITH CM 195962 PER TDRR 09711		11 MAY 64	RS MEM
AB		REVISED PER TDRR 10873		20 JUL 64	RJF
AC		REVISED PER TDRR 11365		11 AUG 64	JWP

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. G1210 DATE 8 MAY 65

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
2. MARK WEIGHT OF ASSEMBLY (50 LBS) PER ND-1002123 ADJACENT TO NAMEPLATE LOCATION.
3. CHASSIS SLIDE MOUNTING SCREWS, ITEM 35, AND FRONT PANEL MOUNTING SCREWS, ITEM 34, SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.
4. DIMENSION A SHALL BE EQUAL TO DIMENSION B WITHIN .040 IN.
5. VENDOR ITEM-SEE SPECIFICATION CONTROL DRAWING.
6. ASSEMBLE RELAYS, ITEM 47, WITH RED DOT IN POSITION SHOWN-24 PLACES.
7. SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM 55 AND 56.
8. SELECT AS REQUIRED.
9. SHIM TO FIT PEEL OFF EXCESS SHIM STOCK.
10. SECURE ITEMS 37 AND 38 USING ITEM 54.
11.
12. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND-1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
13. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER ON ITEM 31 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
14. SECURE SCREWS USING ITEM (73).
15. MARK "DWG REV LTR" AND APPLICABLE DRAWING REVISION LETTER PER ND-1002019, .12 HIGH, COLOR BLACK, IN LOCATION SHOWN.





PARTIAL VIEW "CC"

SHEET 1	SHEET 2
AC	AA
AB	AA
AA	AA
Z	Z
Y	W
W	W
V	V
U	T
T	T

REVISION STATUS OF SHEETS

(T) REPLACES REV'S WITH CHANGE.

SEE NOTE 9

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			X		79	1901627	RUNNING LIST
			1		78	MS21919DG 5 THRU 6	(1897073-105 THRU 106) CLAMP
			1		77	MS21919DG 3 THRU 4	(1897073-103 THRU 104) CLAMP
			2		76	MS21919DG 21 THRU 23	(1897073-121 THRU 123) CLAMP
			2		75	MS21919DG 19 THRU 21	(1897073-119 THRU 121) CLAMP
			2		74	MS21919DG 17 THRU 19	(1897073-117 THRU 119) CLAMP
			AR		73	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
			4		72	MS35333-71	WASHER, LOCK, INT. T.
			6		71	AN960-C6	(1897006-026) WASHER, FLAT
			4		70	AN535-00-4	(1897109-004) SCREW, DRIVE, ROUND HEAD
			1		69	1900864	BRKT, REL & CONN (INSEP ASSY)
			2		68	1900863	BRACKET, SUPPORT
			2		67	AN363C832	(1896990-281) NUT-HEX
			1		66	1900648	ELEC SCHEM-OSCILLOGRAPH SIG SEL
			X		65	ATP-1900056	SPECIFICATIONS
			1		64	1900490-011	
			1		63	1900490-081	
			1		62	1900490-071	
			1		61	1900490-061	
			1		60	1900490-041	
			1		59	1900490-031	
			1		58	1900490-021	SWITCH AND CONNECTOR ASSY
			10		57	1016005-1	SHIM, SLIDE, LOCATING
			AR		56	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
			AR		55	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
			AR		54	MIL-S-40083 (ORD) CL20	SEALING & RETAINING COMP (ES-2554-3)
			1		53	1900490-051	SWITCH & CONNECTOR ASSY
			1		52	1900394	WIRING HARNESS B
			1		51	1900097	WIRING HARNESS A

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTES 5				2		50	1015842	TRANSFORMER
				8		49	AN500AD4-7	(1897012-425) SCREW, MACHINE FIL HD
				2		48	MS35216-27	SCREW, MACHINE, PAN HD
SEE NOTE 5				24		47	1015802-004	RELAY, ARMATURE
SEE NOTE 5				56		46	1016157-004	NUT-SELF-LOCKING
				36		45	AN363C632	(1896990-261) NUT-SELF-LOCKING
				6		44	AN363C1032	(1896990-011) NUT-SELF-LOCKING
				16		43	MS35216-45	SCREW, MACHINE, PAN HD
				12		42	MS35216-42	SCREW, MACHINE, PAN HD
				6		41	MS35216-41	SCREW, MACHINE, PAN HD
				32		40	MS35216-26	SCREW, MACHINE, PAN HD
				4		39	MS35216-32	SCREW, MACHINE, PAN HD
				8		38	AN507C632 R6	(1897003-534) SCREW, MACHINE, FLAT HD, 100°
				16		37	AN507C832 R6	(1897003-564) SCREW, MACHINE, FLAT HD, 100°
(AB) SEE NOTES 5				8		36	AN507C832R12	(1897003-568) SCREW, FLAT HD. 100°
SEE NOTES 5				10		35	1015826-304	SCREW, FLAT HD (HEX SOC)
SEE NOTES 5				6		34	1006783-45	SCREW, BUTTON HD, HEX SOC
SEE NOTE 5				16		33	1015866-007	SPACER
SEE NOTE 8						32		
				1		31	1901304-120	NAMEPLATE, APOLLO GEN
				2		30	MS90078-12-1	(1897077-112) FUSE
				1		29	MS26572-1	FUSEHOLDER-CARTRIDGE
				1		28	1015873-008	FUSEHOLDER (LIGHT IND TYPE)
				10		27	MS91528-2K2B	(1897080-023) KNOB, CONTROL
				2		26	1900015-071	HANDLE ASSY
SEE NOTES 5				1		25	1015791-010	SLIDE ASSY QUICK RELEASE
SEE NOTES 5				1		24	1015791-009	SLIDE ASSY QUICK RELEASE
SEE NOTES 5				1		23	1015820	PHASE GENERATOR 800 CPS
SEE NOTES 5				1		22	1015821	PHASE GENERATOR 3200 CPS
SEE NOTES 5				2		21	1015825-4	SWITCH ROTARY
				4		20	1015981-003	STAND-OFF, HEX
SEE NOTES 5				1		19	1015869-803	LIGHT INDICATOR ASSY
SEE NOTES 5				1		18	1015869-804	LIGHT INDICATOR ASSY
SEE NOTES 5				1		17	1015869-516	LIGHT INDICATOR ASSY
SEE NOTES 5				1		16	1015869-514	LIGHT INDICATOR ASSY
SEE NOTES 5				1		15	1015869-515	LIGHT-INDICATOR ASSY
SEE NOTES 5				1		14	1015869-513	LIGHT-INDICATOR ASSY
				1		13	1900194	PLATE
				2		12	1900191	BRACKET, AMPL (INSEP ASSY)
				1		11	1900190	BRACKET, AMPL (INSEP ASSY)
				1		10	1900189	BRACKET, AMPL (INSEP ASSY)
				24		9	AN526C832 R7	(1897083-757) SCREW, MACHINE, TRUSS HD
				2		8	1900181-011	BUFFER AMPL 800 CPS LO° ASSY
				2		7	1900138-011	BUFFER AMPLIFIER ASSY
				1		6	1900132-011	BUFFER AMPLIFIER ASSY
				1		5	1900140-011	BUFFER AMPL ASSY 3200 CPS
						4		
						3		
				1		2	1900188	PANEL, FRONT
				1		1	1900199	DRAWER, SEL, SIG, OSCILLOGRAPH

AC 1900056

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-377

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Wunderlich DATE 9 APR 63
CHECKED Zeiler 1 JUL 63
APPROVAL Farley A.S. 2 Jul 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO. SIZE E 1900056
SCALE FULL SHEET 1 OF 2

1900056 C

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
A		ADDED ITEMS IN LIST OF MATERIAL	DO 51456	16 APR 63	LS
B		LIST OF MATERIALS REVISED	DO 51483	19 APR 63	WET
C		ADDED SLIDES, HANDLE ASSY IN LIST OF MATERIALS.		7 MAY 63	

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
						TBA	HANDLE ASSY
						TBA	SLIDES
			2			CTM 474 VAK	CAPACITOR (MIL-C-27287)
			2			RC20GF103J	↑
			2			RC20GF245J	RESISTOR, COMPOSITION (MIL-R-11D)
			2			1010397	TRANSISTOR 2N930
			1			1015834	ISOLATION TRANSFORMER
			6			1010270	TRANSISTOR - 2N1613
			2			1010316-21	CAPACITOR, FIXED POLYSTYRENE
			7			CS15BF6R8K	CAPACITOR, TANTALUM (MIL-C-29655)
			3			CS15BD220K	CAPACITOR, TANTALUM (MIL-C-29655)
			1			CL33CH100MN3	↑
			2			CL33CH030MN3	↑
			2			CL33CH300MN3	CAPACITOR, TANTALUM-NON POLAR (MIL-C-3965B
			1			CY20C472J	↑
			3			CY20C202J	↑
		2	1			CY20C272J	↑
			2			CY30C103J	CAPACITOR, GLASS (MIL-C-11272-B
			3			RC42GF101J	↑
			2			RC42GF182J	↑
			4			RC20GF201J	↑
			1			RC20GF511J	↑
			1			RC20GF332J	↑
			3			RC20GF301J	RESISTOR, COMPOSITION (MIL-R-11D)
			2			RN60C4023F	↑
			1			RN75C1471F	↑
			2			RN60C2802F	↑
			1			RN60C1001F	↑
			1			RN60C3010F	↑
			1			RN60C2432F	↑
			2			RN60C3402F	↑
			2			RN60C3321F	↑
			4			RN60C2002F	↑
			2			RN60C6192F	↑
			1			RN65C3200F	↑
			1			RN65C5111F	↑
			2			RN65C1052F	RESISTOR, FIXED FILM (MIL-R-10509D)
			24			1015802-004	RELAY, ARMATURE
			8			1015825-001	ROTARY SWITCH
			11			MS91528-2P2B	KNOB
			1			1015820	PHASE GENERATOR - 800 CPS
			1			1015821	PHASE GENERATOR - 3200 CPS

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 9 APR 63
CHECKED 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 5/8/63
L Gedeman 5/8/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH

CODE IDENT NO.
SIZE D
1900056
SCALE
SHEET

MIL 10780-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1900056 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
		SEE SHEET 1 FOR REVISION RECORD			
D				7/4/63	WK

						TBA	HANDLE ASSY
						TBA	SLIDE
			1			MS 90078-12-1	FUSE, STYLE F02
			1			1015873-008	FUSEHOLDER, INDICATING
			2			1015927-25	CAPACITOR-FIXED, POLYSTYRENE
			2			1015920	TRANSFORMER, POWER
			2			1015913	TRANSFORMER, ISOLATION
			1			MS 26572-1	FUSEHOLDER-CARTRIDGE, EXTRACTOR POST
			8			1015818-660	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			8			1015817-660	CONNECTOR-RECP. ELEC. CRIMP TYPE
			588			1015817-424	PIN CONTACTS
			588			1015818-424	SOCKET CONTACTS
			3			1015867-140	CONNECTOR-RECP. ELEC. CRIMP TYPE
			3			1015867-200	CONNECTOR-RECP. ELEC. CRIMP TYPE
			3			1015868-140	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			3			1015868-200	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			2			1015825-4	SWITCH ROTARY
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004	011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Dluik DATE 9 APR 63
CHECKED Kawaler 10 APR 63
APPROVAL 10 APR 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR
SIGNAL, OSCILLOGRAPH

CODE IDENT NO.
SIZE D
1900056
SCALE —
SHEET 2

MIL 10780-F

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

D 1900056

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		ADDED ITEMS IN LIST OF MATERIAL	DO 51456	16 APR 63	LS
B		LIST OF MATERIALS REVISED	DO 51483	19 APR 63	
Ⓜ C		ADDED SLIDES, HANDLE ASSY IN LIST OF MATERIALS.		7 MAY 63	WR
C-1		CHANGE IN ACCORDANCE WITH MXC-186287	MXC-186287	21 MAY-63	M.G.
C-2		CHANGE IN ACCORDANCE WITH MXC-186523	MXC-186523	21 MAY-63	M.G.
C3		CHANGED IN ACCORDANCE WITH MXC-186894		5 JUN 63	R.D.
C4		CHANGED IN ACCORDANCE WITH MXC-186925		5 JUN 63	R.D
D		REPLACED WITH CHANGE BY REVISION "E" PER MXC187687	02181	3 JUL 63	GCS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			2			RC32GF6R2J	
			2			RC20GF200J	
			2			RC32GF162J	
			2			RC20GF821J	RESISTOR, COMPOSITION (MIL-R-11)
			2			1015850	POWER TRANSFORMER
			7			1015872-1	HEAT SINK, TRANSISTOR
			12			1015870-1	INSULATED DISK, TRANSISTOR
			2			1015930-2	TRANSISTOR
			6			CS13AF220K	CAPACITOR, NON POLAR TANTALUM (MIL-C-26655)
			4			CS13AFR47K	CAPACITOR, NON POLAR TANTALUM (MIL-C-26655)
			2			CTM103VBK	CAPACITOR, FIXED (MIL-C-27287)
			2			CM15F201J03	CAPACITOR, FIXED (MIL-C-5)
			1			RT12C2L103	RESISTOR, VAR. (MIL-R-27208)
			1			RT12C2L502	RESISTOR, VAR. (MIL-R-27208)
			1			RN60B2152F	
			2			RN60B1183F	
			2			RN60B6192F	
			2			RN65B7150F	
			1			RN60B6042F	
			1			RN60B2492F	
			5			RN60B1002F	
			2			RN60C1623C	
			2			RN60B9092F	
			2			RN60B3652F	
			2			RN60B7150F	
			2			RN60B2000F	
			4			RN70B3320F	
			4			RN70B3321F	
			2			RN60C1643C	
			4			RN60B1001F	
			4			RN75B23R7F	RESISTOR, FIXED FILM (MIL-R-10509)
			2			RC20GF204J	RESISTOR, COMPOSITION (MIL-R-11)
			4			RC20GF302J	RESISTOR, COMPOSITION (MIL-R-11)
			660			1015818-424	SOCKET CONTACTS
			10			1015818-660	CONNECTOR-PLUG ELEC
			660			1015817-424	PIN CONTACTS
			10			1015817-660	CONNECTOR-RECEPTACLE ELEC
			2			1900015-071	HANDLE ASSY.
			1			1015791-010	CHASSIS SLIDE ASSY
			1			1015791-009	CHASSIS SLIDE ASSY
			1			MS3127E-22-55PZ	
			1			MS3127E-22-55PY	
			1			MS3127E-22-55PX	
			1			MS3127E-22-55PW	
			1			MS3127E-22-55P	CONNECTOR-ELEC. CRIMP TYPE

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			2			CTM474VAK	CAPACITOR (MIL-C-27287)
			2			RC20GF103J	
			2			RC20GF245J	RESISTOR, COMPOSITION (MIL-R-11D)
			4			1015935-1	TRANSISTOR
			1			1015834	ISOLATION TRANSFORMER
			12			1015938	TRANSISTOR
			2			1010316-21	CAPACITOR, FIXED POLYSTYRENE
			13			CS13AF6R8K	CAPACITOR, TANTALUM (MIL-C-26655)
			1			CS13AD220K	CAPACITOR, TANTALUM (MIL-C-26655)
			1			CL33CH100MN3	
			2			CL33CH030MN3	
			2			CL33CH300MN3	CAPACITOR, TANTALUM-NON POLAR (MIL-C-3965B
			1			CY20C472J	
			3			CY20C202J	
		2	1			CY20C272J	
			2			CY30C103J	CAPACITOR, GLASS (MIL-C-11272-B
			3			RC42GF101J	
			2			RC42GF182J	
			4			RC20GF201J	
			1			RC20GF511J	
			1			RC20GF332J	
			3			RC20GF301J	RESISTOR, COMPOSITION (MIL-R-11D)
			2			RN60C4023F	
			1			RN75C1471F	
			2			RN60C2802F	
			1			RN60C1001F	
			1			RN60C3010F	
			1			RN60C2432F	
			2			RN60C3402F	
			2			RN60C3321F	
			4			RN60C2002F	
			2			RN60C6192F	
			1			RN65C3200F	
			1			RN65C5111F	
			2			RN65C1052F	RESISTOR, FIXED FILM (MIL-R-10509D)
			32			1015802-004	RELAY, ARMATURE
			8			1015825-001	ROTARY SWITCH
			11			MS91528-2K2B	KNOB
			1			1015820	PHASE GENERATOR-800 CPS
			1			1015821	PHASE GENERATOR-3200 CPS

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

(D) REPLACED WITH CHANGE BY REVISION "E" PER MXC187687
PER TDRR 02181

1900004	1900004	011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. Fleck DATE 9 APR 63
CHECKED 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 5/8/63
L Gedeman 5/8/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH

CODE IDENT NO.
SIZE D
1900056
SCALE —
SHEET 1 OF 2

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

1900056

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		REPLACES REVISION "D" WITH CHANGE PER MXC187687 WAS SHEET 1 OF 2 TDRR 02181		3 JUL 63	

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 **DATE** 8 may 63

QUANTITY REQUIRED				EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			011				
			1			1900132	BUFFER AMPLIFIER ASSY
			2			1900138	BUFFER AMPLIFIER ASSY
			2			1900181	BUFFER AMPLIFIER ASSY-800 CPS
			1			1900140	BUFFER AMPLIFIER ASSY-3200 CPS
						TBA	HANDLE ASSY
						TBA	SLIDE
			1			MS90078-12-1	FUSE, STYLE F02
			1			1015873-008	FUSEHOLDER, INDICATING
			1			MS26572-1	FUSEHOLDER-CARTRIDGE, EXTRACTOR POST
			8			1015818-660	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			8			1015817-660	CONNECTOR-RECP. ELEC. CRIMP TYPE
			3			1015867-140	CONNECTOR RECP. ELEC. CRIMP TYPE
			3			1015867-200	CONNECTOR-RECP. ELEC. CRIMP TYPE
			3			1015868-140	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			3			1015868-200	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			2			1015825-4	SWITCH, ROTARY
			558			1015818-424	SOCKET CONTACTS
			10			1015818-660	CONNECTOR-PLUG ELEC.
			558			1015817-424	PIN CONTACTS
			10			1015817-660	CONNECTOR-RECEPTACLE ELEC.
			2			1900015-071	HANDLE ASSY.
			1			1015791-010	CHASSIS SLIDE ASSY
			1			1015791-009	CHASSIS SLIDE ASSY
			1			MS3127E-22-55PZ	↑
			1			MS3127E-22-55PY	↑
			1			MS3127E-22-55PX	↑
			1			MS3127E-22-55PW	↑
			1			MS3127E-22-55P	CONNECTOR-ELEC. CRIMP TYPE
			32			1015802-004	RELAY, ARMATURE
			8			1015825-001	ROTARY SWITCH
			11			MS91528-2K2B	KNOB
			1			1015820	PHASE GENERATOR-800 CPS
			1			1015821	PHASE GENERATOR-3200 CPS

LIST OF PARTS AND MATERIALS

REPLACES REV(D)WITH CHANGE
PER TDRR 02181

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. RHICK DATE 9 APR 63
CHECKED MALEKOWSKI 10 APR 63
APPROVAL D. CARPENTER 10 APR 63
APPROVAL 7/24/63
NASA APPROVAL 7/24/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR,
SIGNAL, OSCILLOGRAPH

CODE IDENT NO.
SIZE D 1900056
SCALE —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
E		REPLACES REVISION "D" WITH CHANGE PER MXC187687 WAS SHEET 1 OF 2 TDRR 02181		7/24/63 3 JUL 63	LIE73
F		CHANGED IN ACCORDANCE WITH MXC 187769		5 AUG 63	JEL RLW
G		(1) REPLACED BY REV H WITH CHANGE	MXC 187852	9 AUG 63	RGB EM
		TDRR 02939		6 Sept 63	wk.

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

QUANTITY REQUIRED							LIST OF PARTS AND MATERIALS
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			2			1015842	TRANSFORMER, ISOLATION
			1			1900132	BUFFER AMPLIFIER ASSY
			2			1900138	BUFFER AMPLIFIER ASSY
			2			1900181	BUFFER AMPLIFIER ASSY-800 CPS 60°
			1			1900140	BUFFER AMPLIFIER ASSY-3200 CPS
						TBA	HANDLE ASSY
						TBA	SLIDE
			1			MS90078-12-1	FUSE, STYLE F02
			1			1015873-008	FUSEHOLDER, INDICATING
			1			MS26572-1	FUSEHOLDER-CARTRIDGE, EXTRACTOR POST
			8			1015818-660	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			8			1015817-660	CONNECTOR-RECP. ELEC. CRIMP TYPE
			3			1015867-140	CONNECTOR RECP. ELEC. CRIMP TYPE
			3			1015867-200	CONNECTOR-RECP. ELEC. CRIMP TYPE
			3			1015868-140	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			3			1015868-200	CONNECTOR-PLUG, ELEC. CRIMP TYPE
			2			1015825-4	SWITCH, ROTARY
			558			1015818-424	SOCKET CONTACTS
			10			1015818-660	CONNECTOR-PLUG ELEC.
			558			1015817-424	PIN CONTACTS
			10			1015817-660	CONNECTOR-RECEPTACLE ELEC.
			2			1900015-071	HANDLE ASSY.
			1			1015791-010	CHASSIS SLIDE ASSY
			1			1015791-009	CHASSIS SLIDE ASSY
			1			MS3127E-22-55PZ	↑
			1			MS3127E-22-55PY	↑
			1			MS3127E-22-55PX	↑
			1			MS3127E-22-55PW	↑
			1			MS3127E-22-55P	CONNECTOR-ELEC. CRIMP TYPE
			32			1015802-004	RELAY, ARMATURE
			8			1015825-001	ROTARY SWITCH
			11			MS91528-2K2B	KNOB
			1			1015820	PHASE GENERATOR-800 CPS
			1			1015821	PHASE GENERATOR-3200 CPS

Ⓖ REPLACED BY REV.H. WITH CHANGE

REPLACES REV(D) WITH CHANGE PER TDRR 02181

APPLICATION		
NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + − DECIMALS + − ANGLES + −
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN W. RHICK DATE 9 APR 63
CHECKED MALEKOWSKI 10 APR 63
APPROVAL D. CARPENTER 10 APR 63
APPROVAL 7/24/63
NASA APPROVAL 7/24/63
MIT APPROVAL 24 Jul 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR,
SIGNAL, OSCILLOGRAPH

CODE IDENT NO.
SIZE D
1900056
SCALE —
SHEET 1 OF 1

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
H_3		(1) REPLACES REV.G WITH CHANGE PER MXC-187852 & ADDED SHEET 2 (2) ADDED PICTURE (3) ADDED REV STATUS BLOCK		9 AUG 63	RCB / JM
		TDRR 02939		5 SEP 63	

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

MARK WEIGHT OF ASSEMBLY PER ND ADJACENT TO NAMEPLATE LOCATION.

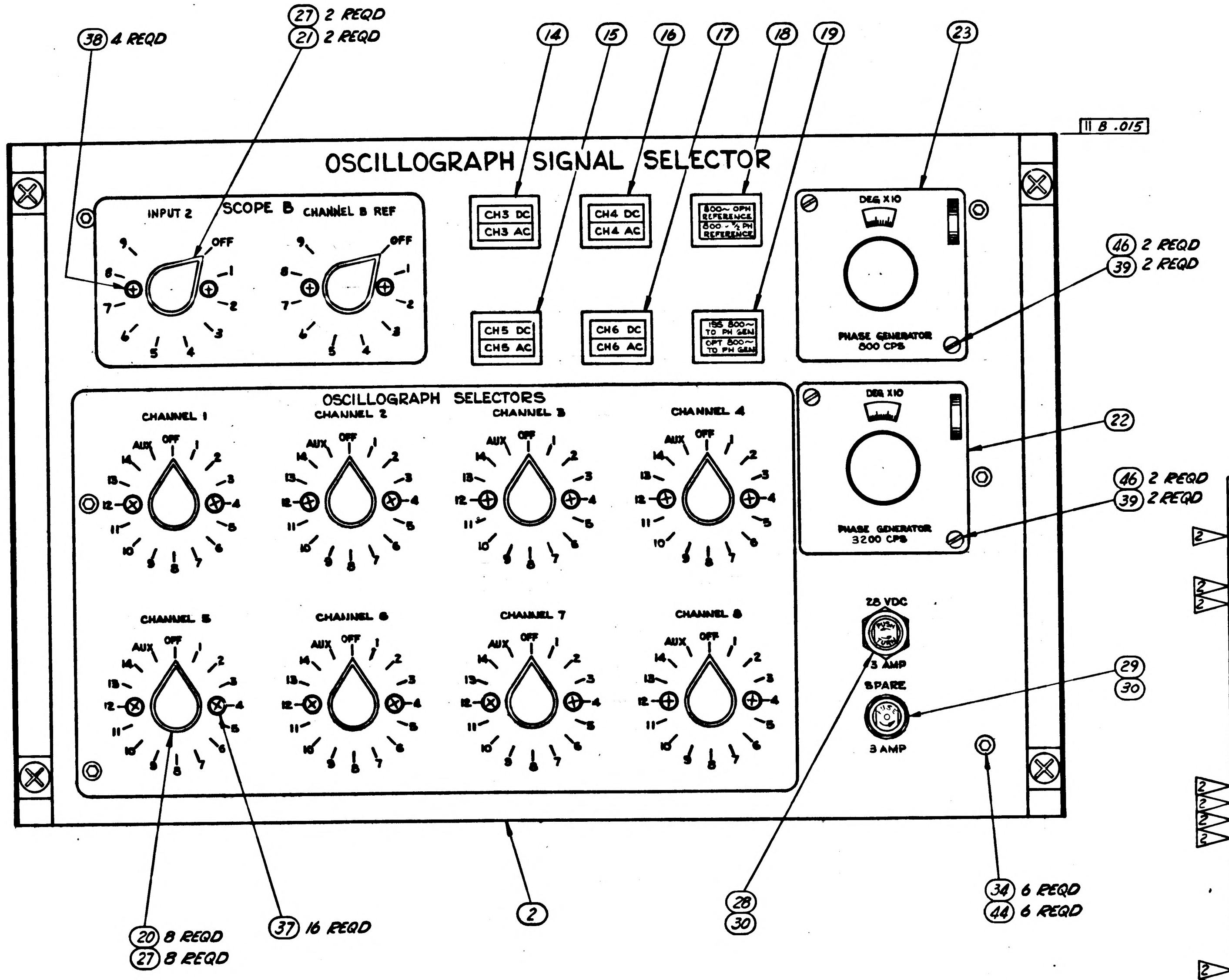
CHASSIS SLIDE MOUNTING SCREWS, ITEM 35, AND FRONT PANEL MOUNTING SCREWS, ITEM 34, SHALL BE SUBJECTED TO TORQUE OF 37-40 LB/IN AT INSTALLATION.

1 ▷ PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010.

2 ▷ VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING

3 ▷ ASSEMBLE RELAYS, ITEM 48, WITH RED DOT IN POSITION SHOWN - 32 PLACES.

SOLDER PER MIL-S-6872 USING ITEMS 45 AND 53.



(27) 2 REQD
(21) 2 REQD
(38) 4 REQD
(14)
(15)
(16)
(17)
(18)
(19)
(23)
1 B .015
OSCILLOGRAPH SIGNAL SELECTOR
INPUT 2
SCOPE B
CHANNEL B REF
OFF
CH3 DC
CH3 AC
CH4 DC
CH4 AC
800~ OPH REFERENCE
800~ ½ PH REFERENCE
CH5 DC
CH5 AC
CH6 DC
CH6 AC
1SS 800~ TO PH GEN
OPT 800~ TO PH GEN
DEG X10
PHASE GENERATOR 800 CPS
(46) 2 REQD
(39) 2 REQD
OSCILLOGRAPH SELECTORS
CHANNEL 1
CHANNEL 2
CHANNEL 3
CHANNEL 4
CHANNEL 5
CHANNEL 6
CHANNEL 7
CHANNEL 8
AUX
(22)
PHASE GENERATOR 3200 CPS
(46) 2 REQD
(39) 2 REQD
28 VDC
3 AMP
SPARE
3 AMP
(29)
(30)
(20) 8 REQD
(27) 8 REQD
(37) 16 REQD
(2)
(28)
(30)
(34) 6 REQD
(44) 6 REQD

SHEET 1	SHEET 2
H	H

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 1 May 63

(H) REPLACES REV. G WITH CHANGE

					011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
					1		54	1900394	WIRING HARNESS B
					AR		53	QQ-S-571 SN 60	SOLDER
					1		52	1900097	WIRING HARNESS A
2 ▷					2		51	1015842	TRANSFORMER
					8		50	AN500U4-7	SCREW, MACHINE, FILLISTER HD
					4		49	MS35216-27	SCREW, MACHINE, PAN HD
2 ▷					32		48	1015802-004	RELAY, ARMATURE
2 ▷					72		47	1010617-4	NUT-SELF-LOCKING
					40		46	AN363C632	NUT-SELF-LOCKING
					AR		45	AR	FLUX
					6		44	AN363C1032	NUT-SELF-LOCKING
					16		43	MS35216-45	SCREW, MACHINE, PAN HD
					10		42	MS35216-42	SCREW, MACHINE, PAN HD
					8		41	MS35216-41	SCREW, MACHINE, PAN HD
					28		40	MS35216-26	SCREW, MACHINE, PAN HD
					4		39	MS35216-32	SCREW, MACHINE, PAN HD
					4		38	AN507C632 R6	SCREW, MACHINE, FLAT HD, 100°
					16		37	AN507C832 R6	SCREW, MACHINE, FLAT HD, 100°
2 ▷					8		36	1015831-257	SCREW, FLAT HD 100° (HEX SOCKET)
2 ▷					10		35	1015826-304	SCREW, FLAT HD (HEX SOCKET)
2 ▷					6		34	1006783-45	SCREW, BUTTON HD, HEX SOCKET
2 ▷					16		33	1015860-007	SPACER
					14		32	MS21919-	CLAMP LOOP
					1		31		NAME PLATE
					2		30	MS90078-12-1	FUSE
					1		29	MS26572-1	FUSEHOLDER - CARTRIDGE
					1		28	1015873-008	FUSEHOLDER-(LIGHT INDICATING TYPE)
					10		27	MS91528-2K2B	KNOB, CONTROL
					2		26	1900015-071	HANDLE ASSY
2 ▷					1		25	1015791-010	SLIDE ASSY QUICK RELEASE
2 ▷					1		24	1015791-009	SLIDE ASSY QUICK RELEASE
2 ▷					1		23	1015820	PHASE GENERATOR 300 CPS
2 ▷					1		22	1015821	PHASE GENERATOR 3200 CPS
2 ▷					2		21	1015825-4	SWITCH ROTARY
					8		20	1900221-021	SWITCH & CONNECTOR ASSY
2 ▷					1		19	1015869-803	LIGHT-INDICATOR ASSY
2 ▷					1		18	1015869-804	LIGHT-INDICATOR ASSY
2 ▷					1		17	1015869-516	LIGHT-INDICATOR ASSY
2 ▷					1		16	1015869-514	LIGHT-INDICATOR ASSY
2 ▷					1		15	1015869-515	LIGHT-INDICATOR ASSY
2 ▷					1		14	1015869-513	LIGHT-INDICATOR ASSY
					1		13	1900194	PLATE
					2		12	1900191	BRACKET, AMPLIFIER (INSEP ASSY)
					1		11	1900190	BRACKET, AMPLIFIER (INSEP ASSY)
					1		10	1900189	BRACKET, AMPLIFIER (INSEP ASSY)
					24		9	AN526C832R7	SCREW, MACHINE, TRUSS HD
					2		8	1900181-011	BUFFER AMPLIFIER 300 CPS (Ø) ASSY
					2		7	1900138-011	BUFFER AMPLIFIER ASSY
					1		6	1900132-011	BUFFER AMPLIFIER ASSY
					1		5	1900140-011	BUFFER AMPLIFIER ASSY 3200 CPS
					1		4	1900193	BRACKET, CONNECTOR
					1		3	1900192	BRACKET, RELAY (INSEP ASSY)
					1		2	1900188	PANEL, FRONT
					1		1	1900199	DRAWER, SELECTOR, SIGNAL, OSCILLOGRAPH
	QUANTITY REQUIRED							LIST OF PARTS AND MATERIALS	

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Wunderlich DATE 9 APR 63
CHECKED Zaufer 1 JUL 63
APPROVAL Farley A.S. 2 Jul 63
APPROVAL L G Beeman 9/3/63
NASA APPROVAL 9/5/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

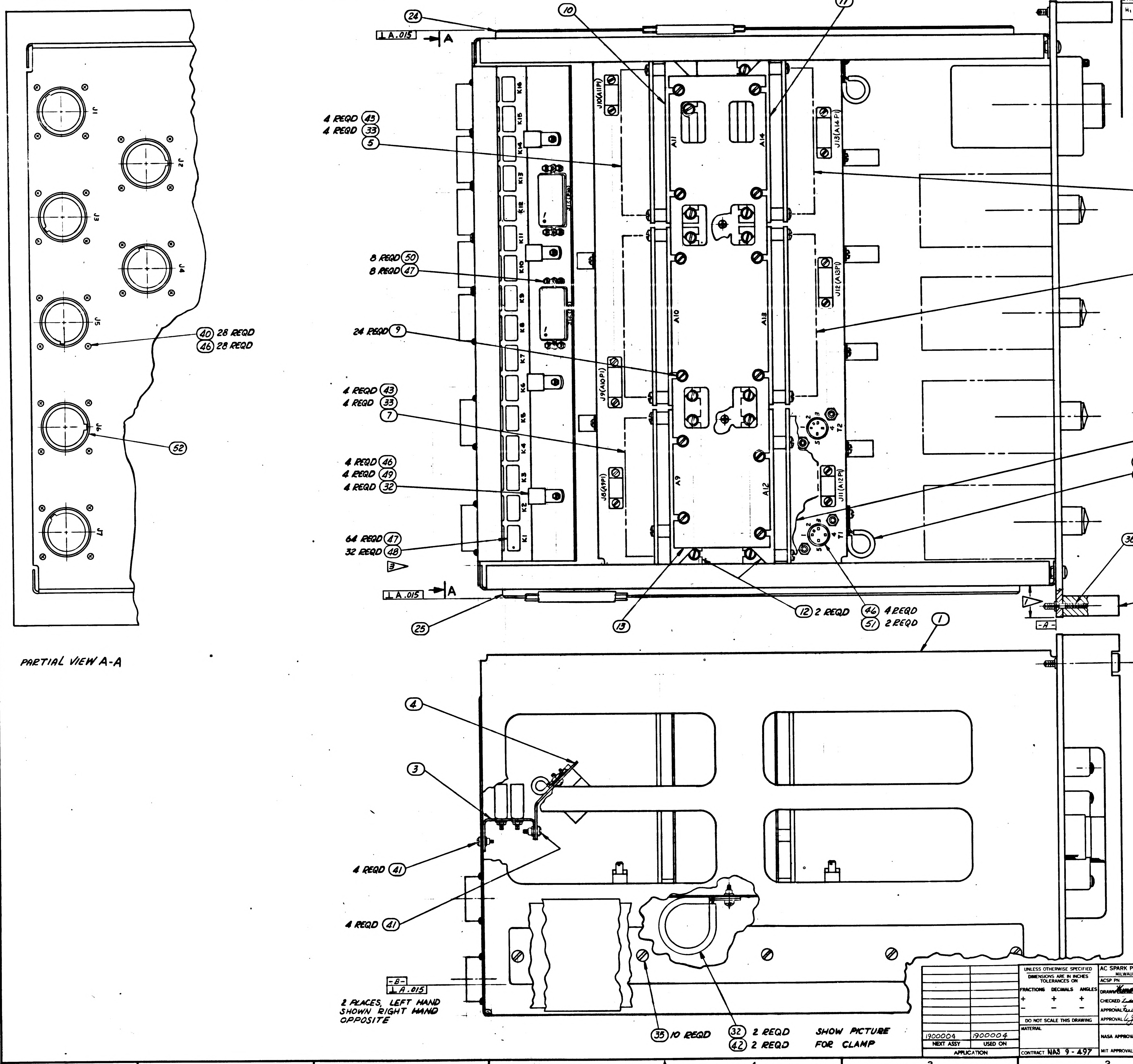
SELECTOR, SIGNAL, OSCILLOGRAPH
ASSEMBLY

CODE IDENT NO.
SIZE E
1900056
SCALE FULL
SHEET 1 OF 2

1900056

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
REVISIONS					
H₁		(H₁) ADDED THIS SHEET	MKC 187852	9 Apr 63	CGS
		TDRR 02939			



PARTIAL VIEW A-A
J1
J2
J3
J4
J5
J6
J7
(40) 28 REQD
(46) 28 REQD
(52)
(24)
(25)
(10)
(11)
(13)
(1)
(3)
(4)
A.015
A
4 REQD (43)
4 REQD (33)
(5)
8 REQD (50)
8 REQD (47)
24 REQD (9)
4 REQD (43)
4 REQD (33)
(7)
4 REQD (46)
4 REQD (49)
4 REQD (32)
64 REQD (47)
32 REQD (48)
(45) 4 REQD
(43) 4 REQD
(33) 4 REQD
(6)
(8) 2 REQD
(45) 4 REQD
(43) 4 REQD
(33) 4 REQD
(7)
(42) 8 REQD
(32) 8 REQD
(36) 8 REQD
(26) 2 REQD
(12) 2 REQD
(46) 4 REQD
(51) 2 REQD
-A-
K1
K2
K3
K4
K5
K6
K7
K8
K9
K10
K11
K12
K13
K14
K15
K16
J10(A11P1)
J9(A10P1)
J8(A9P1)
J13(A14P1)
J12(A13P1)
J11(A12P1)
A9
A10
A11
A12
A13
A14
T1
T2
4 REQD (41)
4 REQD (41)
-B-
A.015
2 PLACES, LEFT HAND SHOWN RIGHT HAND OPPOSITE
(35) 10 REQD
(32) 2 REQD
(42) 2 REQD
SHOW PICTURE FOR CLAMP

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ______ DATE

(H₁) ADDED THIS SHEET

1900004	1900004	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS + − DECIMALS + − ANGLES + − DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN ACSP PN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
NEXT ASSY	USED ON	MATERIAL	DRAWN Hunderlich DATE 3 APR 63 CHECKED 11 JUL 63 APPROVAL 2 JUL 63 APPROVAL 9/2/63	SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY	
APPLICATION		CONTRACT NAS 9-497	NASA APPROVAL 9/6/63 MIT APPROVAL Sep 63	CODE IDENT NO.	SIZE E 1900056
				SCALE FULL	SHEET 2 OF 2

1900056

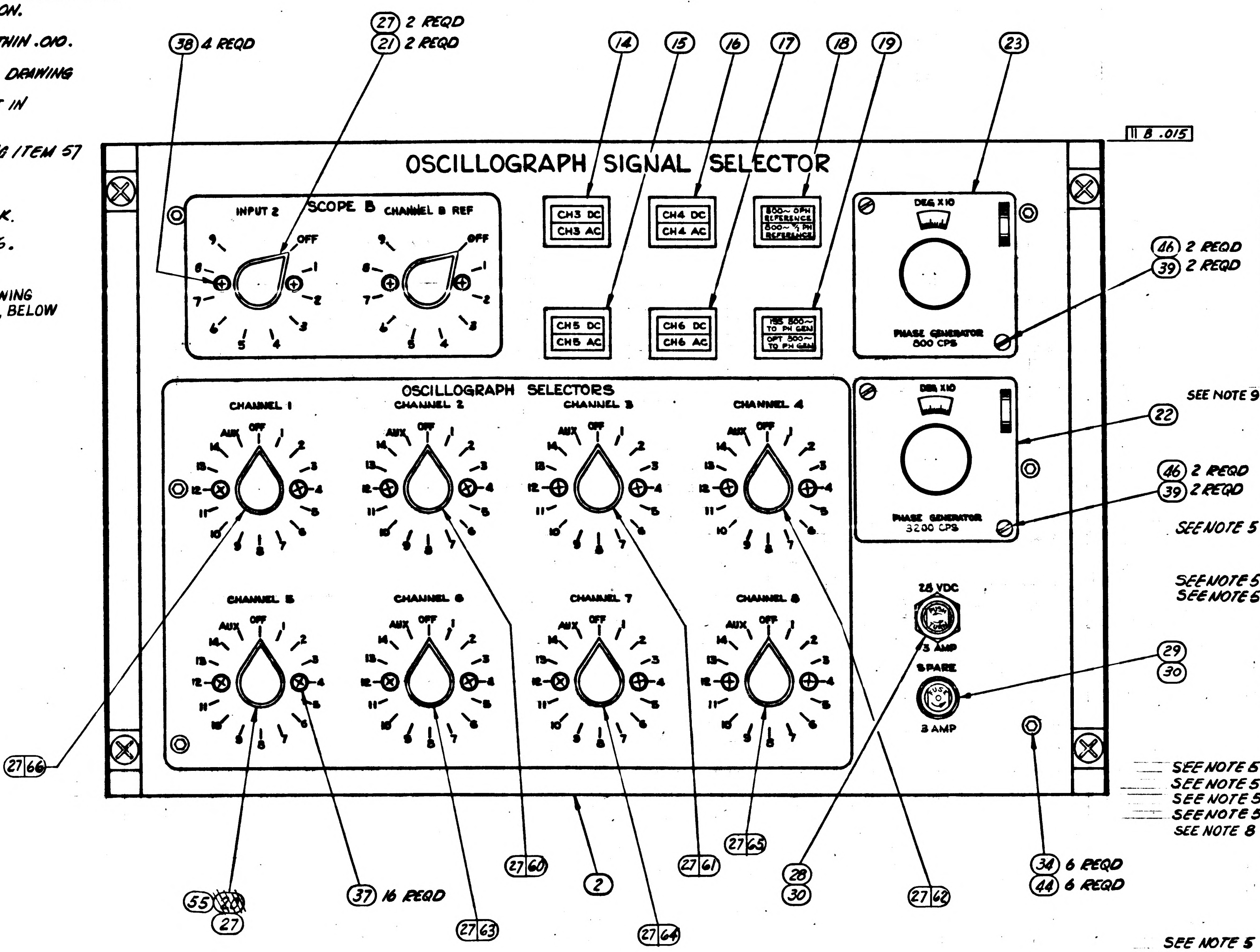
INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK WEIGHT OF ASSEMBLY PER ND-1002123 ADJACENT TO NAMEPLATE LOCATION.
3. CHASSIS SLIDE MOUNTING SCREWS, ITEM 35, AND FRONT PANEL MOUNTING SCREWS, ITEM 34, SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.
4. PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING
6. ASSEMBLE RELAYS, ITEM 48, WITH RED DOT IN POSITION SHOWN - 24 PLACES.
7. SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM 57 AND 58
8. SELECT AS REQUIRED.
9. SHIM TO FIT PEEL OFF EXCESS SHIM STOCK.
10. SECURE ITEMS 37 AND 38 USING ITEM 56.
11. SERIALIZE PER ND-1002023
12. MARK "SCHEMATIC" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND-1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
H₃		(1) REPLACES REV.G WITH CHANGE PER MXC-187852 & ADDED SHEET 2 (2) ADDED PICTURE (3) ADDED REV STATUS BLOCK		9 AUG 63	RGB
		TDRR 02939		5 SEP	
J		(1) CHANGE IN ACCORDANCE WITH MXC 188196		17 SEP 63	G.M.
K		(1) CHANGE IN ACCORDANCE WITH MXC 188565		17 SEP 63	G.M.
L		(1) CHANGE IN ACCORDANCE WITH MXC 189248		18 SEP 63	G.M.
M		(1) CHANGE IN ACCORDANCE WITH MXC 189785		13 SEP 63	
N		CHANGE IN ACCORDANCE WITH MXC 190223 PER TDRR		28 SEP 63	



OSCILLOGRAPH SIGNAL SELECTOR
SCOPE B
INPUT 2
CHANNEL B REF
OFF
CH3 DC
CH3 AC
CH4 DC
CH4 AC
CH5 DC
CH5 AC
CH6 DC
CH6 AC
800~ 0 PH REFERENCE
800~ ½ PH REFERENCE
ISS 800~ TO PH GEN
OPT 800~ TO PH GEN
DEG X10
PHASE GENERATOR 800 CPS
PHASE GENERATOR 3200 CPS
OSCILLOGRAPH SELECTORS
CHANNEL 1
CHANNEL 2
CHANNEL 3
CHANNEL 4
CHANNEL 5
CHANNEL 6
CHANNEL 7
CHANNEL 8
AUX
28 VDC
3 AMP
SPARE
3 AMP
(38) 4 REQD
(27) 2 REQD
(21) 2 REQD
(14)
(15)
(16)
(17)
(18)
(19)
(23)
(46) 2 REQD
(39) 2 REQD
SEE NOTE 9
(22)
(46) 2 REQD
(39) 2 REQD
(29)
(30)
(27)(66)
(55)
(27)
(37) 16 REQD
(27)(63)
(27)(60)
(2)
(27)(64)
(27)(61)
(27)(65)
(28)
(30)
(27)(62)
(34) 6 REQD
(44) 6 REQD
11 B .015

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	2		71	1900864	BRKT, REL. & CONN. (INSEP. ASSY)
	2		70	1900863	BRACKET, SUPPORT
	2		69	AN363C832	NUT-HEX
	1		68	1900648	ELEC SCHEM - OSCILLOGRAPH SIG SEL
	X		67	ATP-1900056	SPECIFICATIONS
	1		66	1900490-011	
	1		65	1900490-001	
	1		64	1900490-071	
	1		63	1900490-061	
	1		62	1900490-041	
	1		61	1900490-031	
	1		60	1900490-021	SWITCH AND CONNECTOR ASSY
SEE NOTE 9	10		59	1016005-1	SHIM, SLIDE, LOCATING
	AR		58	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
	AR		57	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	AR		56	MIL-S-40083(ORD) CL 20	SEALING & RETAINING COMPOUND (ES-2544-3)
	1		55	1900490-051	SWITCH & CONNECTOR ASSEMBLY
	1		54	1900394	WIRING HARNESS B
			53		
	1		52	1900097	WIRING HARNESS A
SEE NOTE 5	2		51	~~1015843~~	~~TRANSFORMER~~
	8		50	AN500D4-7	SCREW, MACHINE, FILLISTER HD
	2		49	MS35216-27	SCREW, MACHINE, PAN HD
SEE NOTE 5	24		48	1015802-004	RELAY, ARMATURE
SEE NOTE 5	56		47	1010617-4	NUT-SELF-LOCKING
	36		46	AN363C632	NUT-SELF-LOCKING
			45		
	6		44	AN363C1032	NUT-SELF-LOCKING
	16		43	MS35216-45	SCREW, MACHINE, PAN HD
	12		42	MS35216-42	SCREW, MACHINE, PAN HD
	6		41	MS35216-41	SCREW, MACHINE, PAN HD
	28		40	MS35216-26	SCREW, MACHINE, PAN HD
	4		39	MS35216-32	SCREW, MACHINE, PAN HD
	4		38	AN507C632 R6	SCREW, MACHINE, FLAT HD, 100°
	16		37	AN507C832 R6	SCREW, MACHINE, FLAT HD, 100°
SEE NOTE 5	8		36	1015831-257	SCREW, FLAT HD 100° (HEX SOCKET)
SEE NOTE 5	10		35	1015826-304	SCREW, FLAT HD (HEX SOCKET)
SEE NOTE 5	6		34	1006783-45	SCREW, BUTTON HD, HEX SOCKET
SEE NOTE 5	16		33	1015860-007	SPACER
SEE NOTE 8	10		32	MS-21919DG-6 THRU 21	CLAMP CUSHIONED
	1		31		NAME PLATE
	2		30	MS90078-12-1	FUSE
	1		29	MS26572-1	FUSEHOLDER - CARTRIDGE
	1		28	1015873-008	FUSEHOLDER - (LIGHT INDICATING TYPE)
	10		27	MS91528-2K2B	KNOB, CONTROL
	2		26	1900015-071	HANDLE ASSY
SEE NOTE 5	1		25	1015791-010	SLIDE ASSY QUICK RELEASE
SEE NOTE 5	1		24	1015791-009	SLIDE ASSY QUICK RELEASE
SEE NOTE 5	1		23	1015820	PHASE GENERATOR 800 CPS
SEE NOTE 5	1		22	1015821	PHASE GENERATOR 3200 CPS
SEE NOTE 5	2		21	1015825-4	SWITCH ROTARY
			20		
SEE NOTE 5	1		19	1015869-803	LIGHT-INDICATOR ASSY
SEE NOTE 5	1		18	1015869-804	LIGHT-INDICATOR ASSY
SEE NOTE 5	1		17	1015869-516	LIGHT-INDICATOR ASSY
SEE NOTE 5	1		16	1015869-514	LIGHT-INDICATOR ASSY
SEE NOTE 5	1		15	1015869-515	LIGHT-INDICATOR ASSY
SEE NOTE 5	1		14	1015869-513	LIGHT-INDICATOR ASSY
	1		13	1900194	PLATE
	2		12	1900191	BRACKET, AMPLIFIER (INSEP ASSY)
	1		11	1900190	BRACKET, AMPLIFIER (INSEP ASSY)
	1		10	1900189	BRACKET, AMPLIFIER (INSEP ASSY)
	24		9	AN526C832R7	SCREW, MACHINE, TRUSS HD
	2		8	1900181-011	BUFFER AMPLIFIER 800 CPS LO ASSY
	2		7	1900138-011	BUFFER AMPLIFIER ASSY
	1		6	1900132-011	BUFFER AMPLIFIER ASSY
	1		5	1900140-011	BUFFER AMPLIFIER ASSY 3200 CPS
			4		
			3		
	1		2	1900188	PANEL, FRONT
	1		1	1900199	DRAWER, SELECTOR, SIGNAL, OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

N	N
M	L
L	L
K	K
J	J
H	H
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 7 May 63

(H₁) REPLACES REV. G WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Hinderlich DATE 9 APR 63
CHECKED 1 JUL 63
APPROVAL 2 Jul 63
APPROVAL L G Gilman 9/3/63
NASA APPROVAL 9/5/63
MIT APPROVAL 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

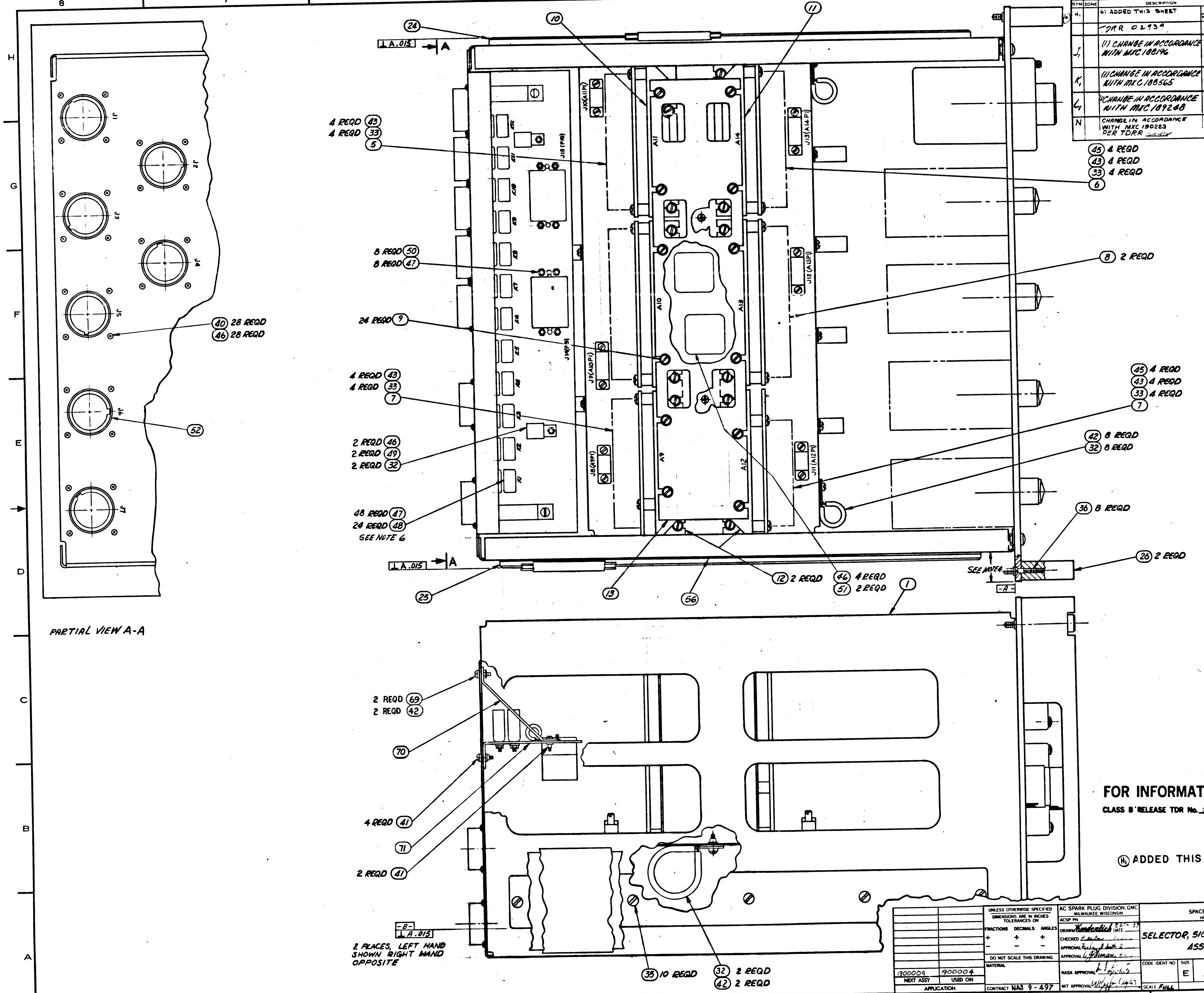
SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY

CODE IDENT NO. SIZE E 1900056
SCALE FULL SHEET 1 OF 2

1900056 N

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
REVISIONS					
H₁		(H₁) ADDED THIS SHEET	MXC 187853	9 AUG 63	
		TDRR 02939			
J₁		(1) CHANGE IN ACCORDANCE WITH MXC 188196		17 SEP 63	
K₁		(1) CHANGE IN ACCORDANCE WITH MXC 188565		7 SEP 63	
L₁		(1) CHANGE IN ACCORDANCE WITH MXC 189248		3 SEP 63	
N		CHANGE IN ACCORDANCE WITH MXC 190223 PER TDRR		25 SEP 63	DRC


8
7
6
5
4
3
2
1
H
G
F
E
D
C
B
A
⊥ A.015
A
J1
J2
J3
J4
J5
J6
J7
(40) 28 REQD
(46) 28 REQD
(52)
PARTIAL VIEW A-A
(24)
(10)
(11)
4 REQD (43)
4 REQD (33)
(5)
8 REQD (50)
8 REQD (47)
24 REQD (9)
4 REQD (43)
4 REQD (33)
(7)
2 REQD (46)
2 REQD (49)
2 REQD (32)
48 REQD (47)
24 REQD (48)
SEE NOTE 6
(25)
(13)
(56)
(12) 2 REQD
(46) 4 REQD
(51) 2 REQD
(1)
(45) 4 REQD
(43) 4 REQD
(33) 4 REQD
(6)
(8) 2 REQD
(45) 4 REQD
(43) 4 REQD
(33) 4 REQD
(7)
(42) 8 REQD
(32) 8 REQD
(36) 8 REQD
(26) 2 REQD
SEE NOTE 4
-A-
J15 (P10)
J14 (P9)
J10 (A11P1)
J9 (A10P1)
J8 (A9P1)
J13 (A14P1)
J12 (A13P1)
J11 (A12P1)
A9
A10
A11
A12
A13
A14
K1
K2
K3
K4
K5
K6
K7
K8
K9
K10
K11
K12
2 REQD (69)
2 REQD (42)
(70)
4 REQD (41)
(71)
2 REQD (41)
-B-
⊥ A.015
2 PLACES, LEFT HAND SHOWN RIGHT HAND OPPOSITE
(35) 10 REQD
(32) 2 REQD
(42) 2 REQD

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 020 DATE 1 May 63

(H₁) ADDED THIS SHEET

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN Wunderlich DATE
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY

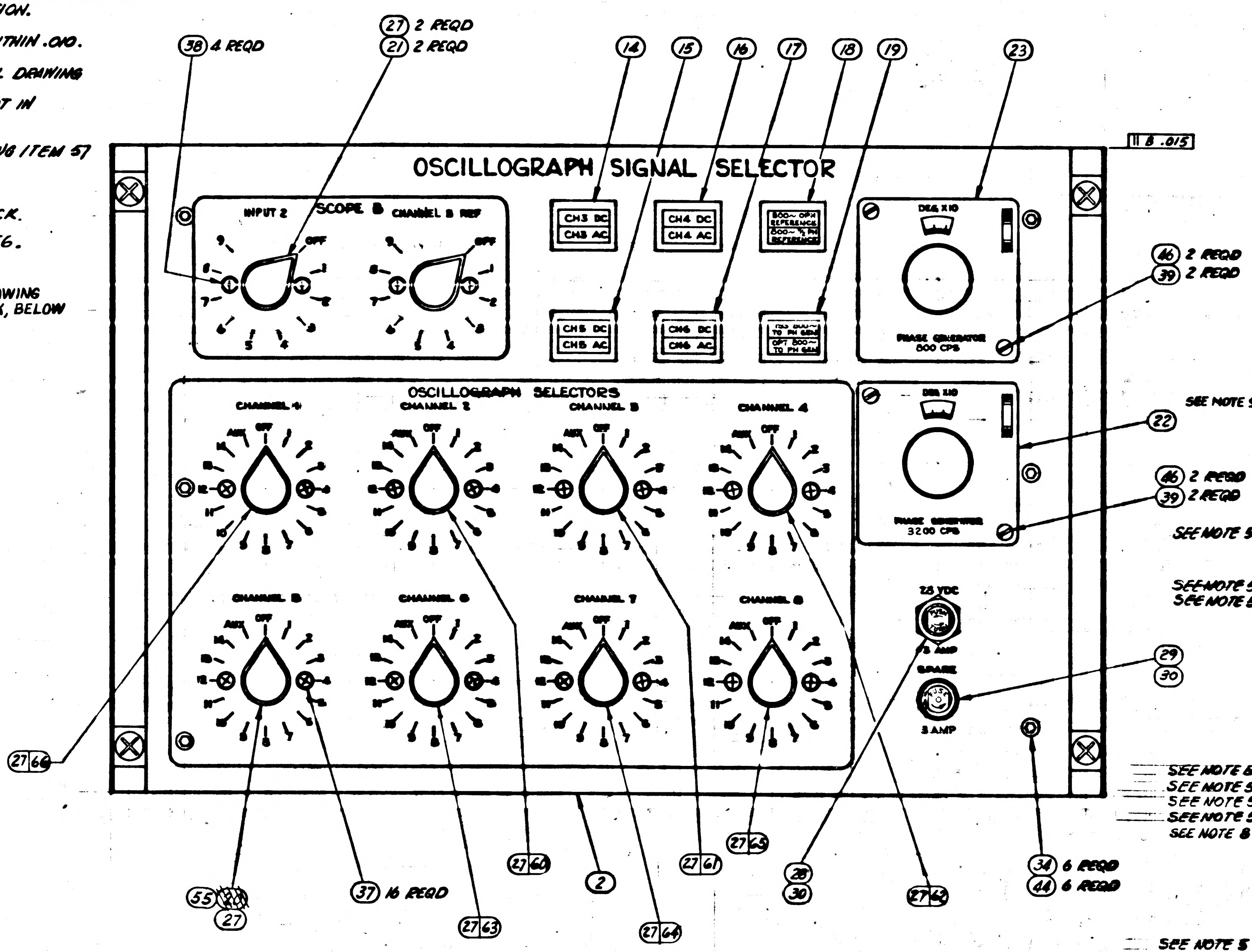
CODE IDENT NO. SIZE E 1900056
SCALE FULL SHEET 2 OF 2

1900056 N B

INCHES
PHOTOGRAPHIC SCALE ONLY

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MARK WEIGHT OF ASSEMBLY PER ND-1002123 ADJACENT TO NAMEPLATE LOCATION.
3. CHASSIS SLIDE MOUNTING SCREWS, ITEM 35, AND FRONT PANEL MOUNTING SCREWS, ITEM 34, SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.
4. PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010.
5. VENDOR ITEM - SEE SPECIFICATION CONTROL DRAWING
6. ASSEMBLE RELAYS, ITEM 48, WITH RED DOT IN POSITION SHOWN - 24 PLACES.
7. SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM 57 AND 58
8. SELECT AS REQUIRED.
9. SHIM TO FIT PEEL OFF EXCESS SHIM STOCK.
10. SECURE ITEMS 37 AND 38 USING ITEM 56.
11. SERIALIZE PER ND-1002023
12. MARK "SCHEMATIC" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND-1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.



REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
H₈		REPLACES REV. G WITH CHANGE PER MXC-187852 & ADDED SHEET 2 (2) ADDED PICTURE (3) ADDED REV STATUS BLOCK		9 AUG 63	
		TDRR 02939		5 SEP 63	WL
J		(1) CHANGE IN ACCORDANCE WITH MXC 188196		17 SEP 63	G.M.
K		(1) CHANGE IN ACCORDANCE WITH MXC 188565		17 SEP 63	G.M.
L		(1) CHANGE IN ACCORDANCE WITH MXC 189248		18 SEP 63	G.M.
M		(1) CHANGE IN ACCORDANCE WITH MXC 189785		18 SEP 63	G.M.
N		CHANGE IN ACCORDANCE WITH MXC 190223 PER TDRR 24417		23 SEP 63	DKD WK
P		REVISION STATUS CHANGED PER MXC 190921		2 DEC 63	E.H.
R		ADDED P/N 1900705 & APOLLO G&N TO ITEM 31. ADDED ITEM 72 PER MXC 190927		3 DEC 63	
S		REPLACED WITH CHANGE BY REV. "T" PER MXC 191627 TDRR 07672		23 DEC 63	

	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				4		72	AN535-00-4	SCREW, DRIVE, ROUNDHEAD
				2		71	1900864	BRKT, REL. & CONN. (INSEP. ASSY)
				2		70	1900863	BRACKET, SUPPORT
				2		69	AN363C832	NUT-HEX
				1		68	1900648	ELEC SCHEM - OSCILLOGRAPH SIG SEL
				X		67	ATP-1900056	SPECIFICATIONS
				1		66	1900490-011	
				1		65	1900490-081	
				1		64	1900490-071	
				1		63	1900490-061	
				1		62	1900490-041	
				1		61	1900490-031	
				1		60	1900490-021	SWITCH AND CONNECTOR ASSY
SEE NOTE 9				10		59	1016005-1	SHIM, SLIDE, LOCATING
				AR		58	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
				AR		57	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				AR		56	MIL-S-40083 (ORD) CL 20	SEALING & RETAINING COMPOUND (ES-2544-3)
				1		55	1900490-051	SWITCH & CONNECTOR ASSEMBLY
				1		54	1900394	WIRING HARNESS B
						53		
				1		52	1900097	WIRING HARNESS A
SEE NOTE 5				2		51	1015842	TRANSFORMER
				8		50	AN500D4-7	SCREW, MACHINE, FILLISTER HD
				2		49	MS35216-27	SCREW, MACHINE, PAN HD
SEE NOTE 5				24		48	1015802-004	RELAY, ARMATURE
SEE NOTE 5				56		47	1016151-004	NUT-SELF-LOCKING
				36		46	AN363C632	NUT-SELF-LOCKING
						45		
				6		44	AN363C1032	NUT-SELF-LOCKING
				16		43	MS35216-45	SCREW, MACHINE, PAN HD
				12		42	MS35216-42	SCREW, MACHINE, PAN HD
				6		41	MS35216-41	SCREW, MACHINE, PAN HD
				28		40	MS35216-26	SCREW, MACHINE, PAN HD
				4		39	MS35216-32	SCREW, MACHINE, PAN HD
				4		38	AN507C632 R6	SCREW, MACHINE, FLAT HD, 100°
				16		37	AN507C832 R6	SCREW, MACHINE, FLAT HD, 100°
SEE NOTE 6				8		36	1015831-257	SCREW, FLAT HD 100° (HEX SOCKET)
SEE NOTE 5				10		35	1015826-304	SCREW, FLAT HD (HEX SOCKET)
SEE NOTE 5				6		34	[illegible]-45	SCREW, BUTTON HD, HEX SOCKET
SEE NOTE 5				16		33	1015860-007	SPACER
SEE NOTE 8				10		32	MS-21919DG-6 THRU 21	CLAMP CUSHIONED
				1		31	1900705	NAME PLATE, APOLLO G&N
				2		30	MS90078-12-1	FUSE
				1		29	MS26572-1	FUSEHOLDER - CARTRIDGE
				1		28	1015873-008	FUSEHOLDER - (LIGHT INDICATING TYPE)
				10		27	MS91528-2K2B	KNOB, CONTROL
				2		26	1900015-071	HANDLE ASSY
SEE NOTE 5				1		25	1015791-010	SLIDE ASSY QUICK RELEASE
SEE NOTE 5				1		24	1015791-009	SLIDE ASSY QUICK RELEASE
SEE NOTE 5				1		23	1015820	PHASE GENERATOR 800 CPS
SEE NOTE 5				1		22	1015821	PHASE GENERATOR 3200 CPS
SEE NOTE 5				2		21	1015825-4	SWITCH ROTARY
						20		
SEE NOTE 5				1		19	1015869-803	LIGHT - INDICATOR ASSY
SEE NOTE 5				1		18	1015869-804	LIGHT - INDICATOR ASSY
SEE NOTE 5				1		17	1015869-516	LIGHT - INDICATOR ASSY
SEE NOTE 5				1		16	1015869-514	LIGHT - INDICATOR ASSY
SEE NOTE 5				1		15	1015869-515	LIGHT - INDICATOR ASSY
SEE NOTE 5				1		14	1015869-513	LIGHT - INDICATOR ASSY
				1		13	1900194	PLATE
				2		12	1900191	BRACKET, AMPLIFIER (INSEP ASSY)
				1		11	1900190	BRACKET, AMPLIFIER (INSEP ASSY)
				1		10	1900189	BRACKET, AMPLIFIER (INSEP ASSY)
				24		9	AN526C832R7	SCREW, MACHINE, TRUSS HD
				2		8	1900181-011	BUFFER AMPLIFIER 800 CPS 0° ASSY
				2		7	1900138-011	BUFFER AMPLIFIER ASSY
				1		6	1900132-011	BUFFER AMPLIFIER ASSY
				1		5	1900140-011	BUFFER AMPLIFIER ASSY 3200 CPS
						4		
						3		
				1		2	1900188	PANEL, FRONT
				1		1	1900199	DRAWER, SELECTOR, SIGNAL, OSCILLOGRAPH

LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
S	S
R	P
P	P
N	N
M	L
L	L
K	K
J	J
H	H

REVISION STATUS OF SHEETS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 1 May 63

Ⓗ REPLACES REV. G WITH CHANGE

Ⓢ REPLACED WITH CHANGE BY REV "T"

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1300004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

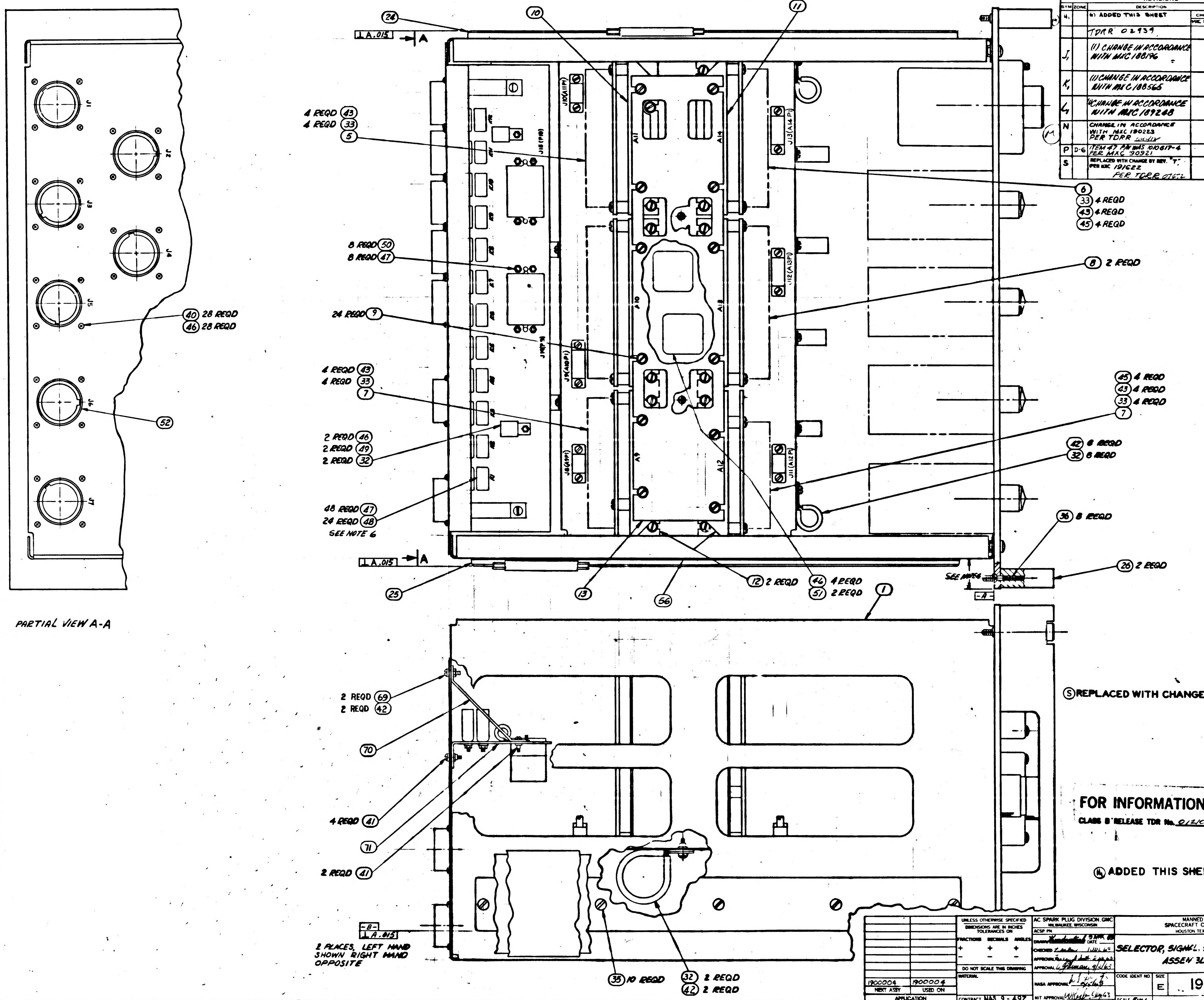
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 9 APR 63
CHECKED
APPROVAL 2 Jul 63
APPROVAL 9/3/63
NASA APPROVAL 9/5/63
MIT APPROVAL 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY

CODE IDENT NO. SIZE E 1900056
SCALE FULL SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
H₁		(H) ADDED THIS SHEET	MXC 187852	9 NOV 63	OGB
		TDRR 02939		5 Aug 63	WR
J₁		(1) CHANGE IN ACCORDANCE WITH MXC 188196		17 SEP 63	G.M.
K₁		(1) CHANGE IN ACCORDANCE WITH MXC 188565		17 SEP 63	G.M.
L₁		(1) CHANGE IN ACCORDANCE WITH MXC 189248		18 SEP 63	G.M.
N		CHANGE IN ACCORDANCE WITH MXC 190223 PER TDRR [illegible]		25 SEP 63	DKD
P	D-6	ITEM 47 P/N WAS 1010617-4 PER MXC 190921		2 DEC 63	RJW
S		REPLACED WITH CHANGE BY REV. "T". PER MXC 191622 PER TDRR 07472		23 DEC 63	R.D. JEL



1.A.015
A
24
10
11
4 REQD 43
4 REQD 33
5
8 REQD 50
8 REQD 47
24 REQD 9
4 REQD 43
4 REQD 33
7
2 REQD 46
2 REQD 49
2 REQD 32
48 REQD 47
24 REQD 48
SEE NOTE 6
6
33 4 REQD
43 4 REQD
45 4 REQD
8 2 REQD
45 4 REQD
43 4 REQD
33 4 REQD
7
42 6 REQD
32 6 REQD
36 8 REQD
26 2 REQD
SEE NOTE 4
-A-
25
13
56
12 2 REQD
46 4 REQD
51 2 REQD
1
J1
J2
J3
J4
J5
J6
J7
40 28 REQD
46 28 REQD
52
A11
A14
A10
A13
A9
A12
J10 (A11P)
J13 (A14P)
J9 (A10P)
J12 (A13P)
J8 (A9P)
J11 (A12P)
J18 (P18)
J19 (P19)
2 REQD 69
2 REQD 42
70
4 REQD 41
71
2 REQD 41
-B-
1.A.015
2 PLACES, LEFT HAND SHOWN RIGHT HAND OPPOSITE
35 10 REQD
32 2 REQD
42 2 REQD

PARTIAL VIEW A-A

Ⓢ REPLACED WITH CHANGE BY REV "T"

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 0121C DATE 8 May 63

Ⓗ₁ ADDED THIS SHEET

1900004	1900004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 5 MAR 63
CHECKED [illegible] 1 JUL 63
APPROVAL [illegible] 2 JUL 63
APPROVAL [illegible] 9/3/63
NASA APPROVAL [illegible] 9/5/63
MIT APPROVAL [illegible] 5 Aug 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

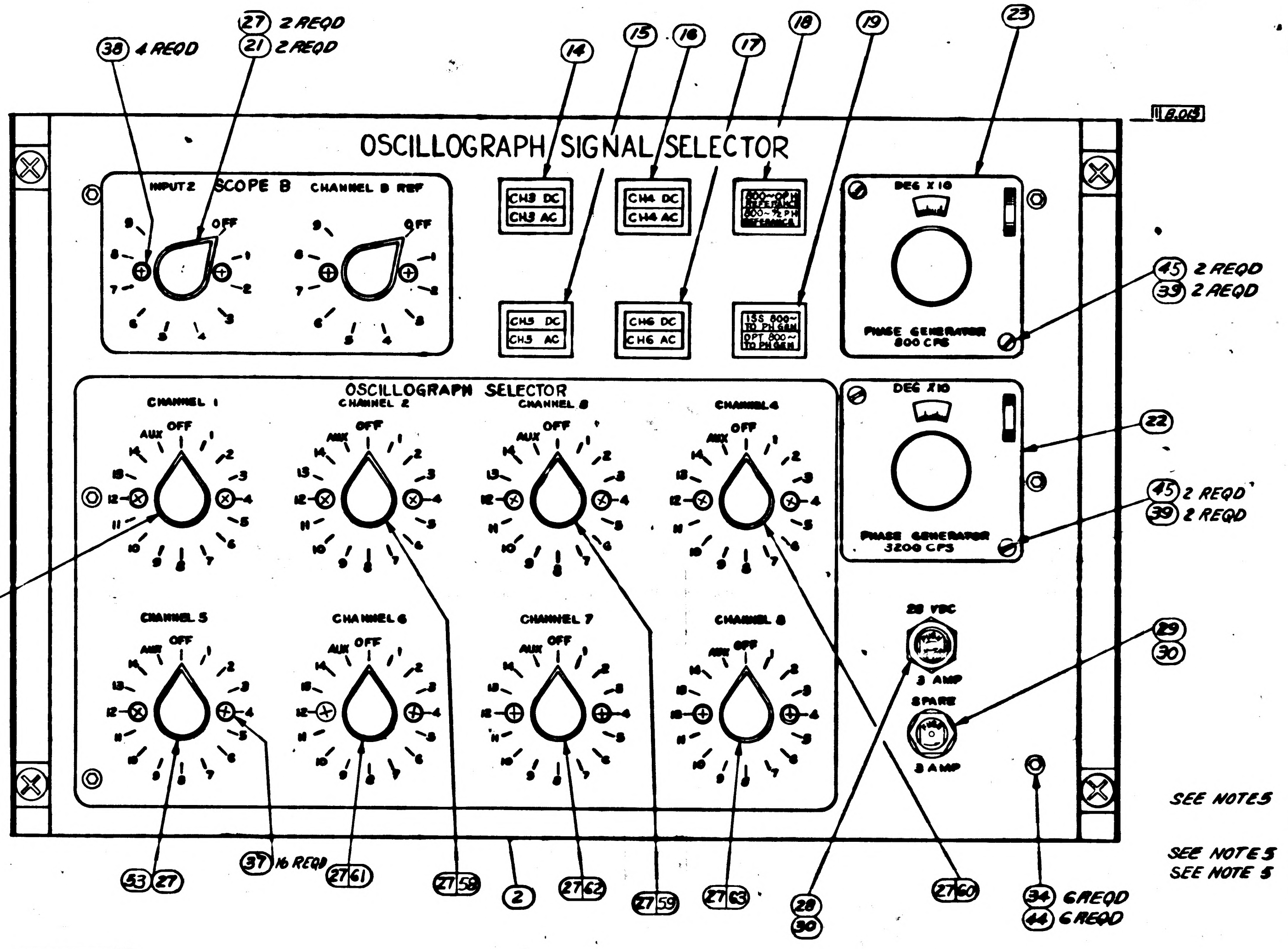
SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY

CODE IDENT NO.
SIZE E
1900056
SCALE FULL
SHEET 2 OF 2

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
REVISIONS					
T		REPLACES REV. T WITH CHANGE PER AXC 19XG22 REVISED PER TDR		23 DEC 63	RD JEL
U		CHANGE IN ACCORDANCE WITH CM 193006 PER TDRR 07672		9 JAN 64	GM JE
V		CHANGE IN ACCORDANCE WITH CM 192214 PER TDRR 07673		10 JAN 64	GM JE
W		CHANGE IN ACCORDANCE WITH CM 194148 PER TDRR 07676		23 JAN 64	JE

NOTES:

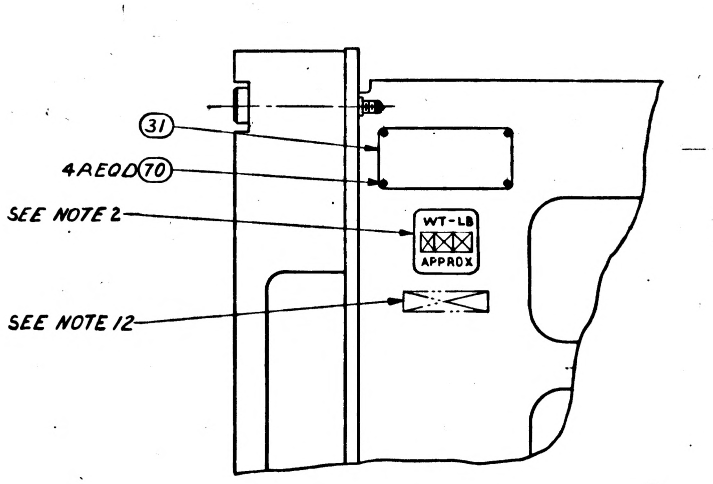
1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
2. MARK WEIGHT OF ASSEMBLY PER ND-1002123 ADJACENT TO NAMEPLATE LOCATION.
3. CHASSIS SLIDE MOUNTING SCREWS, ITEM 35, AND FRONT PANEL MOUNTING SCREWS, ITEM 34, SHALL BE SUBJECTED TO TORQUE OF 37-40 IN. LB AT INSTALLATION.
4. PANEL AND CHASSIS TO BE CENTRALIZED WITHIN .010.
5. VENDOR ITEM-SEE SPECIFICATION CONTROL DRAWING.
6. ASSEMBLE RELAYS, ITEM 47, WITH RED DOT IN POSITION SHOWN-24 PLACES.
7. SOLDER PER MIL-S-6872 (ES-2505-1) USING ITEM 55 AND 56.
8. SELECT AS REQUIRED.
9. SHIM TO FIT PEEL OFF EXCESS SHIM STOCK.
10. SECURE ITEMS 37 AND 38 USING ITEM 54.
11. SERIALIZE PER ND-1002023.
12. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND-1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
13. MARK APPLICABLE CONTRACT NUMBER AND SERIAL NUMBER ON ITEM 31 IN ACCORDANCE WITH ND 1002023. LETTERS AND NUMERALS TO BE .06 HIGH.
14. SECURE SCREWS USING ITEM (73).



(38) 4 REQD
(27) 2 REQD
(21) 2 REQD
(14)
(15)
(16)
(17)
(18)
(19)
(23)
8.0B
OSCILLOGRAPH SIGNAL SELECTOR
INPUT 2
SCOPE B
CHANNEL B REF
OFF
CH3 DC
CH3 AC
CH4 DC
CH4 AC
CH5 DC
CH5 AC
CH6 DC
CH6 AC
800~ 0 PH REFERENCE
800~ ½ PH REFERENCE
ISS 800~ TO PH GEN
OPT 800~ TO PH GEN
DEG X 10
PHASE GENERATOR 800 CPS
PHASE GENERATOR 3200 CPS
(45) 2 REQD
(39) 2 REQD
(22)
OSCILLOGRAPH SELECTOR
CHANNEL 1
CHANNEL 2
CHANNEL 3
CHANNEL 4
CHANNEL 5
CHANNEL 6
CHANNEL 7
CHANNEL 8
AUX
28 VDC
3 AMP
SPARE
3 AMP
(29)
(30)
(27)(64)
(53)(27)
(37) 16 REQD
(27)(61)
(27)(58)
(2)
(27)(62)
(27)(59)
(27)(63)
(28)
(30)
(27)(60)
(34) 6 REQD
(44) 6 REQD

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1210 DATE 8 MAY 63



(31)
4 REQD (70)
SEE NOTE 2
WT-LB
APPROX
SEE NOTE 12

	ON	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	AR		73	MIL-S-40083-C130	(ES-2544-5) SEALING COMPOUND
	4		72	MS35333-71	WASHER, LOCK, INT. T.
	4		71	AN960-C6	WASHER, FLAT
	4		70	AN535-00-4	SCREW, DRIVE, ROUND HEAD
	1		69	1900864	BRKT, REL & CONN (INSEP ASSY)
	2		68	1900863	BRACKET, SUPPORT
	2		67	AN363C832	NUT-HEX
	1		66	1900648	ELEC SCHEM-OSCILLOGRAPH SIG SEL
	X		65	ATP-1900056	SPECIFICATIONS
	1		64	1900490-011	
	1		63	1900490-081	
	1		62	1900490-071	
	1		61	1900490-061	
	1		60	1900490-041	
	1		59	1900490-031	
	1		58	1900490-021	SWITCH AND CONNECTOR ASSY
SEE NOTE 9	10		57	1016005-1	SHIM, SLIDE, LOCATING
	AR		56	MIL-F-14256 QQ-S-571	FLUX (ES-2184) FLUX TYPE A (ES-2175 TYPE RMA)
	AR		55	QQ-S-571	SOLDER, SN60 (ES-2175 ALLOY 1)
	AR		54	MIL-S-40083(ORD) CL20	SEALING & RETAINING COMP (ES 2544-3)
	1		53	1900490-051	SWITCH & CONNECTOR ASSY
	1		52	1900394	WIRING HARNESS B
	1		51	1900097	WIRING HARNESS A

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

	ON	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
SEE NOTE 5	2		50	1015842	TRANSFORMER
	8		49	AN500D4-7	SCREW, MACHINE FIL HD
	2		48	MS35216-27	SCREW. MACHINE. PAN HD
SEE NOTE 5	24		47	1015802-004	RELAY, ARMATURE
SEE NOTE 5	56		46	1016151-004	NUT-SELF-LOCKING
	36		45	AN363C632	NUT-SELF-LOCKING
	6		44	AN363C1032	NUT-SELF-LOCKING
	16		43	MS35216-45	SCREW, MACHINE, PAN HD
	12		42	MS35216-42	SCREW, MACHINE, PAN HD
	6		41	MS35216-41	SCREW, MACHINE, PAN HD
	32		40	MS35216-26	SCREW, MACHINE, PAN HD
	4		39	MS35216-32	SCREW, MACHINE, PAN HD
	4		38	AN507C632 R6	(1897003-534) SCREW, MACHINE, FLAT HD, 100°
	16		37	AN507C832 R6	SCREW, MACHINE, FLAT HD, 100°
SEE NOTE 5	8		36	1015831-253	SCREW, FLAT HD 100° (HEX SOC)
SEE NOTE 5	10		35	1015826-304	SCREW, FLAT HD (HEX SOC)
SEE NOTE 5	6		34	1006783-45	SCREW, BUTTON HD, HEX SOC
SEE NOTE 5	16		33	1015860-007	SPACER
SEE NOTE 8	8		32	MS-21919DG-6 THRU 21	CLAMP CUSHIONED
	1		31	1901304-120	NAMEPLATE, APOLLO, GEN
	2		30	MS90078-12-1	FUSE
	1		29	MS26512-1	FUSEHOLDER-CARTRIDGE
	1		28	1015873-008	FUSEHOLDER (LIGHT IND TYPE)
	10		27	MS91528-2K2B	KNOB, CONTROL
	2		26	1900015-071	HANDLE ASSY
SEE NOTE 5	1		25	1015791-010	SLIDE ASSY QUICK RELEASE
SEE NOTE 5	1		24	1015791-009	SLIDE ASSY QUICK RELEASE
SEE NOTE 5	1		23	1015820	PHASE GENERATOR 800 CPS
SEE NOTE 5	1		22	1015821	PHASE GENERATOR 3200 CPS
SEE NOTE 5	2		21	1015825-4	SWITCH ROTARY
	4		20	1015981-003	STAND-OFF, HEX
SEE NOTE 5	1		19	1015869-803	LIGHT INDICATOR ASSY
SEE NOTE 5	1		18	1015869-804	LIGHT INDICATOR ASSY
SEE NOTE 5	1		17	1015869-516	LIGHT INDICATOR ASSY
SEE NOTE 5	1		16	1015869-514	LIGHT INDICATOR ASSY
SEE NOTE 5	1		15	1015869-515	LIGHT-INDICATOR ASSY
SEE NOTE 5	1		14	1015869-513	LIGHT-INDICATOR ASSY
	1		13	1900194	PLATE
	2		12	1900191	BRACKET, AMPL (INSEP ASSY)
	1		11	1900190	BRACKET, AMPL (INSEP ASSY)
	1		10	1900189	BRACKET, AMPL (INSEP ASSY)
	24		9	AN526C832 R7	SCREW, MACHINE, TRUSS HD
	2		8	1900181-011	BUFFER AMPL 800 CPS 0° ASSY
	2		7	1900138-011	BUFFER AMPLIFIER ASSY
	1		6	1900132-011	BUFFER AMPLIFIER ASSY
	1		5	1900140-011	BUFFER AMPL ASSY 3200 CPS
			4		
			3		
	1		2	1900188	PANEL, FRONT
	1		1	1900199	DRAWER, SEL, SIG, OSCILLOGRAPH

QUANTITY REQUIRED — LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2
W	W
V	V
U	T
T	T

REVISION STATUS OF SHEETS

(T) REPLACES REV'S WITH CHANGE

NEXT ASSY	USED ON
1900004	1900004

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 2 APR 63
CHECKED 63
APPROVAL 2 Feb 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

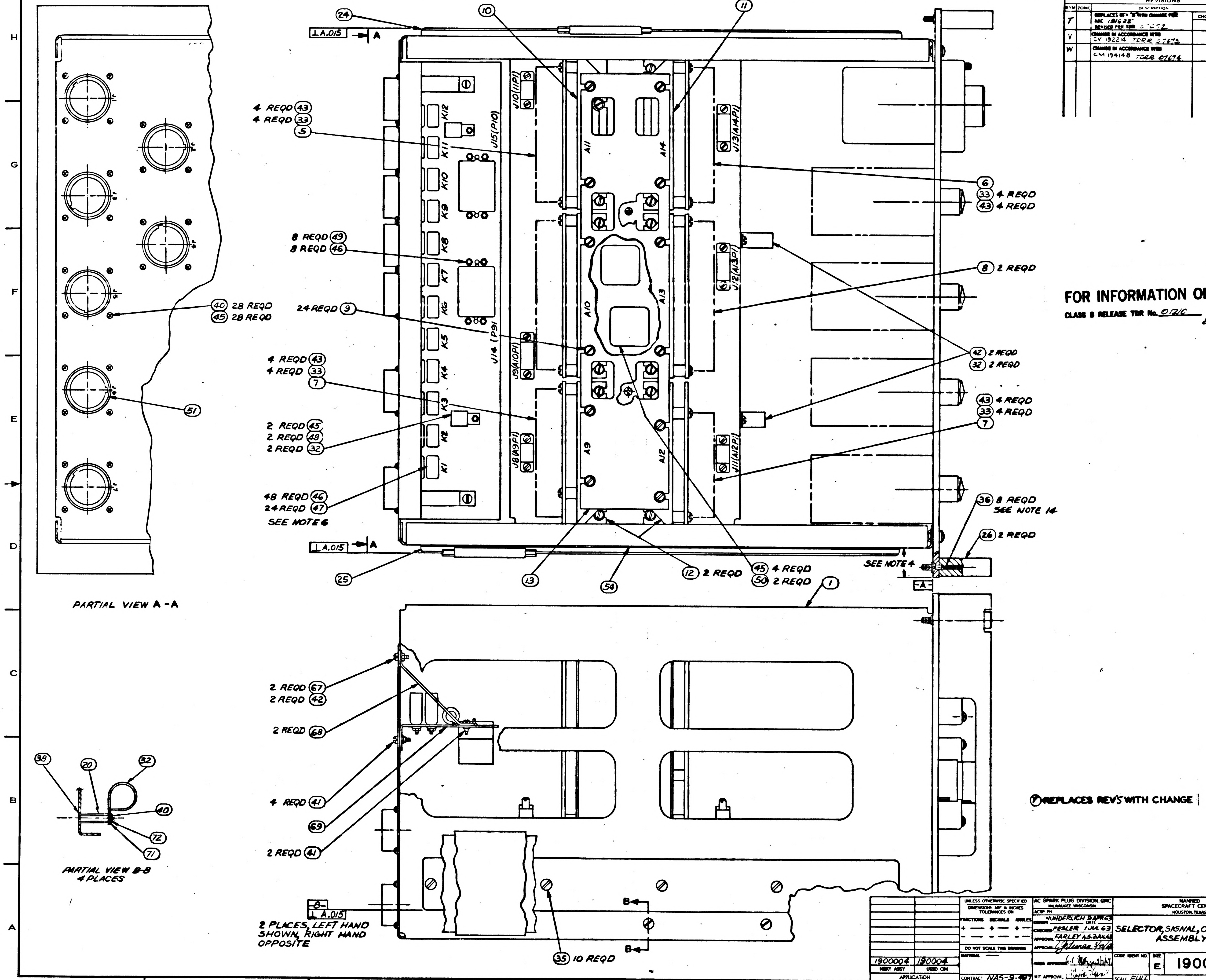
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY

CODE IDENT NO. — SIZE E — 1900056

SCALE FULL — SHEET 1 OF 2

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
T		REPLACES REV "S" WITH CHANGE PER MKC 191622 REVISED PER TDR 07672		23 DEC 63	R.D.
V		CHANGE IN ACCORDANCE WITH CV 192214 TDRR 07673			
W		CHANGE IN ACCORDANCE WITH CM 194148 TDRR 07674			



⊥ A.015 → A
(24)
(10)
(11)
4 REQD (43)
4 REQD (33)
(5)
K12
K11
K10
K9
K8
K7
K6
K5
K4
K3
K2
K1
J15(P10)
J14(P9)
J10(J11P1)
J9(A10P1)
J8(A9P1)
J13(A14P1)
J12(A13P1)
J11(A12P1)
A11
A14
A10
A13
A9
A12
(6)
(33) 4 REQD
(43) 4 REQD
8 REQD (49)
8 REQD (46)
(8) 2 REQD
24 REQD (9)
(40) 28 REQD
(45) 28 REQD
(42) 2 REQD
(32) 2 REQD
4 REQD (43)
4 REQD (33)
(7)
(51)
(43) 4 REQD
(33) 4 REQD
(7)
2 REQD (45)
2 REQD (48)
2 REQD (32)
48 REQD (46)
24 REQD (47)
SEE NOTE 6
(36) 8 REQD
SEE NOTE 14
(26) 2 REQD
SEE NOTE 4
⊥ A.015 → A
(25)
(13)
(54)
(12) 2 REQD
(45) 4 REQD
(50) 2 REQD
A
(1)
PARTIAL VIEW A-A
2 REQD (67)
2 REQD (42)
2 REQD (68)
4 REQD (41)
(69)
2 REQD (41)
(38)
(20)
(32)
(40)
(72)
(71)
PARTIAL VIEW B-B
4 PLACES
B
⊥ A.015
2 PLACES, LEFT HAND SHOWN, RIGHT HAND OPPOSITE
B
B
(35) 10 REQD

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

(T) REPLACES REV'S WITH CHANGE

1900004	190004
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN WUNDERLICH DATE 9 APR 63
CHECKED FESLER 1 JUL 63
APPROVAL FARLEY A.S. 2 JUL 63
APPROVAL
NASA APPROVAL
MIT APPROVAL

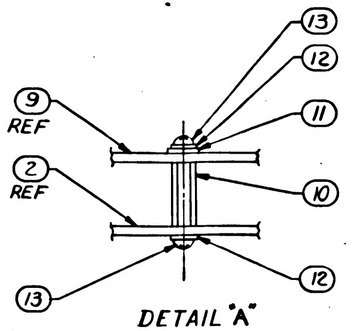
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, OSCILLOGRAPH ASSEMBLY

CODE IDENT NO.
SIZE E
1900056
SCALE FULL
SHEET 2 OF 2

1900056 W

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
P		REPLACES REV. N WITH CHANGE PER MXC 192013 REVISED PER TDR		17 JAN 64	
R		CHANGE IN ACCORDANCE WITH CM 192774		21 JAN 64	
S		CHANGE IN ACCORDANCE WITH CM 193215 PER TDRR 06969		29 JAN 64 3-7-64	LGH EH WK
T		CHANGE IN ACCORDANCE WITH CM 194035 REVISED PER TDRR 06970		5 FEB 64 3-7-64	SA JAC WK
V		CHANGE IN ACCORDANCE WITH CM 194676 REVISED PER TDRR 06972		6 FEB 64 3-7-64	SA JAC WK
Z		CHANGE IN ACCORDANCE WITH CM 195963 TDRR 08326		21 APR 64	JB EF
AA		REPLACED WITH CHANGE BY REV. PER CM 197137 REVISED PER TDR 10252	—	15 MAY 64	JJJ CP

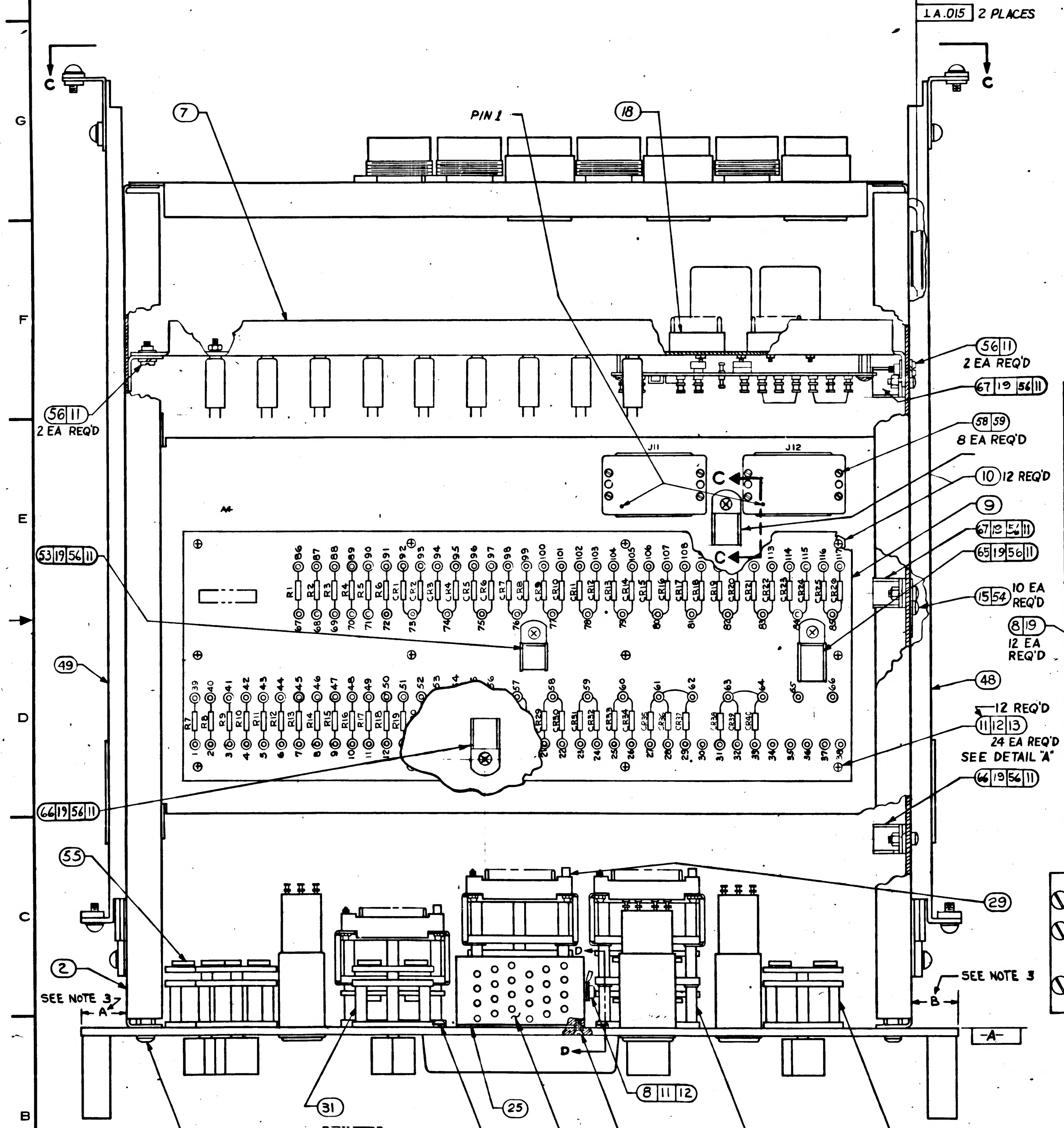


13
12
11
9 REF
2 REF
10
13
12

DETAIL "A"
ITEM NO'S. ARE FOR REFERENCE ONLY

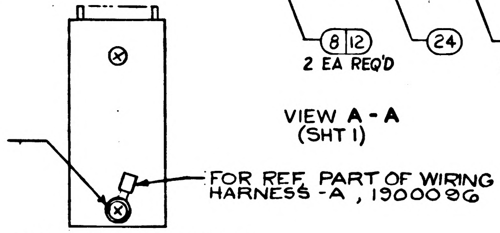
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1210 DATE 1 May 63



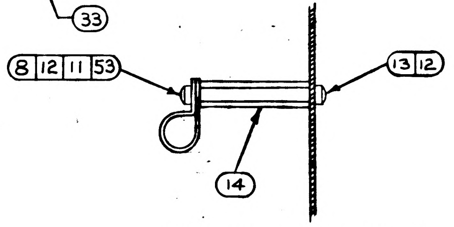
⊥ A .015 2 PLACES
C
C
7
PIN 1
18
56 11
2 EA REQ'D
67 19 56 11
56 11
2 EA REQ'D
58 59
8 EA REQ'D
J11
J12
C
C
10 12 REQ'D
9
67 12 54 11
65 19 56 11
15 54 10 EA REQ'D
8 19 12 EA REQ'D
53 19 56 11
49
48
12 REQ'D
11 12 13 24 EA REQ'D SEE DETAIL "A"
66 19 56 11
66 19 56 11
55
29
2
SEE NOTE 3
A
SEE NOTE 3
B
-A-
D
31
25
24
26 2 REQ'D
52
33
8 11 12
5 6 6 EA REQ'D
8 12 2 EA REQ'D

VIEW A-A
(SHT 1)



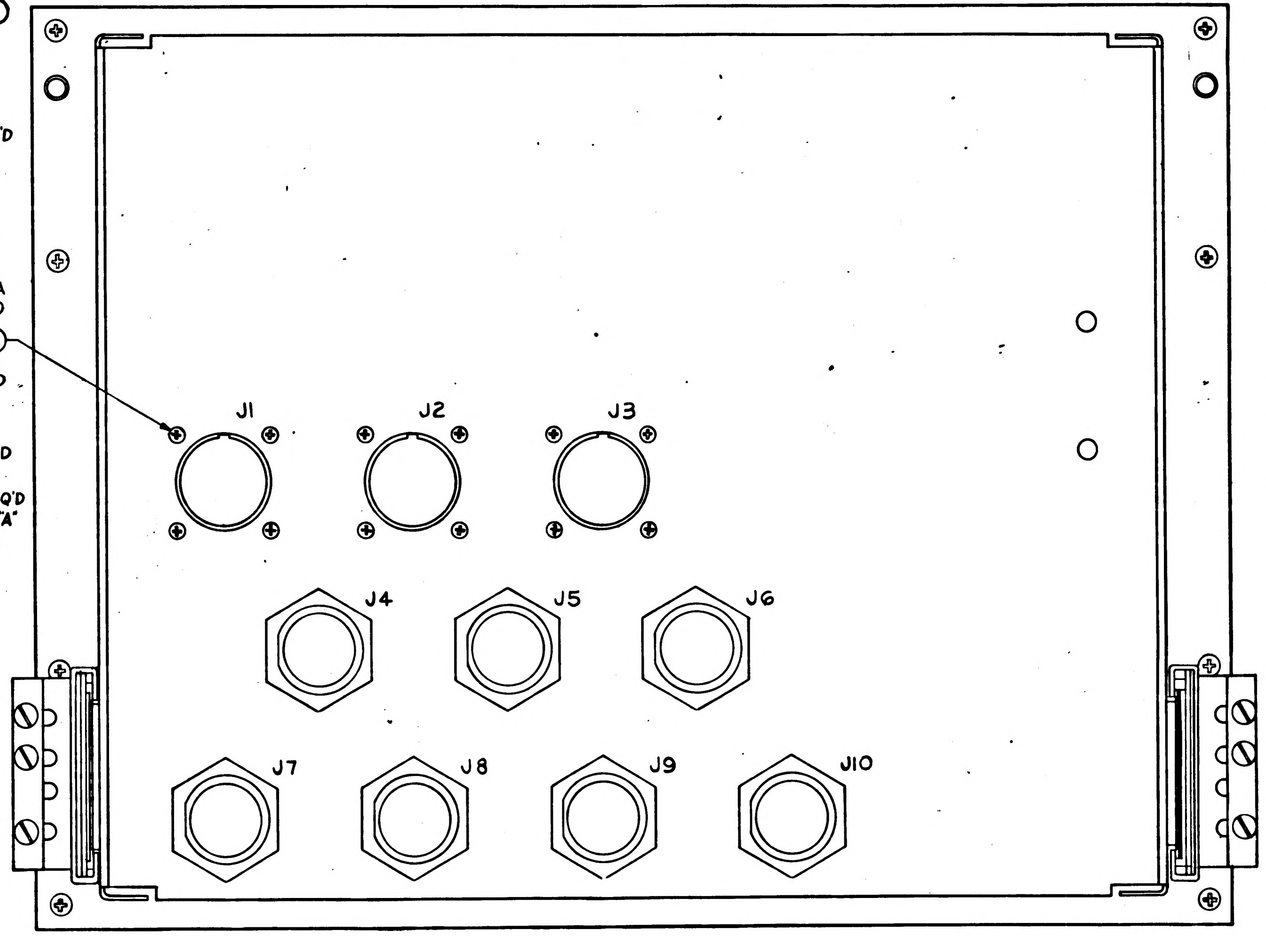
SEE NOTE - 13
FOR REF. PART OF WIRING HARNESS -A , 1900086

PARTIAL VIEW D-D
(ROTATED 90°)



8 12 11 53
13 12
14

SECTION VIEW C-C



J1
J2
J3
J4
J5
J6
J7
J8
J9
J10

VIEW C-C

Ⓐ REPLACED WITH CHANGE BY REV AB

Ⓟ REPLACES REV-N WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN 10 JUN 63
CHECKED DATE 10 JUN 63
APPROVAL
APPROVAL
NASA APPROVAL 3-17-64
MIT APPROVAL 3-17 Jan 64

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO
SIZE E
1900057
SCALE 1:1
SHEET 2 OF 3

1900057

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

3. DIMENSION A SHALL BE EQUAL TO DIMENSION B WITHIN .040 IN.

4. PARTIAL REF. DESIGNATIONS ARE SHOWN: PREFIX WITH UNIT NUMBER OR SUB-ASSEMBLY DESIGNATION (S) OR BOTH FOR COMPLETE DESIGNATION.

5. SOLDER PER MIL-STD-440 USING ITEMS 60 & 61.
6. VENDOR ITEM-SEE SPECIFICATION CONTROL DWG.

7. SELECT AS REQ'D

8. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK
9. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO A TORQUE OF 37-40 IN.LB AT INSTALLATION.

10. MARK WEIGHT OF ASSEMBLY (46 LBS) PER ND 1002123 ADJACENT TO NAMEPLATE.

11. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

12. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM-64 IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .06 HIGH.

13. REMOVE EXISTING FLAT HEAD SCREW AND REPLACE WITH ITEMS ⑧, ⑪ & ⑫.

14. SECURE SCREWS USING ITEM 69.

15. QTY SPECIFIED AR INDICATES - AS REQD.

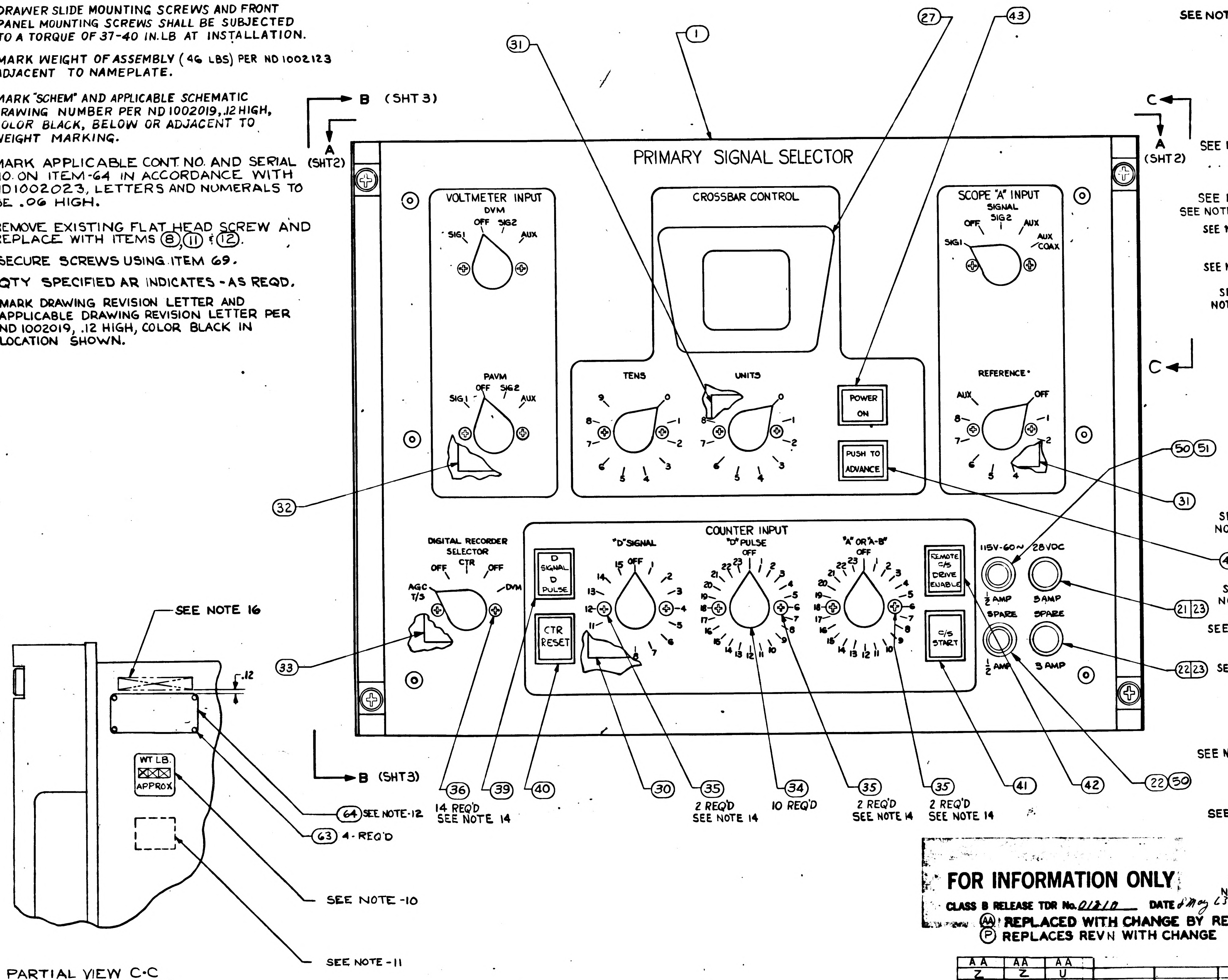
16. MARK DRAWING REVISION LETTER AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.

REVISIONS

SYM	ZONE	DESCRIPTION	DATE	APPD
Ⓜ AA		REPLACED WITH CHANGE BY REV AB PER CM 197137 REVISED PER TDR 10252	15 MAY 64	JJ / CP

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
P		REPLACES REV. N WITH CHANGE PER MXC192013 REVISED PER TDR		17 JAN 64	LG
R		CHANGE IN ACCORDANCE WITH CM 192774		21 JAN 64	LGH
S		CHANGE IN ACCORDANCE WITH CM 193215 TDRR 06969		23 JAN 64 3-7-64	LGH EH WR
T		CHANGE IN ACCORDANCE WITH CM194035 REVISE PER TDRR 06970		3 FEB 64 3-7-64	SA JAC WR
U		CHANGE IN ACCORDANCE WITH CM194149 REVISE PER TDRR 06971		3 FEB 64 3-7-64	SA JAC WR
V		CHANGE IN ACCORDANCE WITH CM194676 REVISED PER TDR 06972		6 FEB 64 3-7-64	S.A. JAC WR
W		CHANGE IN ACCORDANCE WITH CM 195341		2 APR 64	FM
Y		CHANGE IN ACCORDANCE WITH CM 195594 REVISED CUSTOMER DATA (V2-64) PER TDRR 08325		14 APR 64	JG
Ⓜ Z		CHANGE IN ACCORDANCE WITH CM 195963 PER TDRR 08326		21 APR 64	JB EF



PARTIAL VIEW C-C

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	X		70	PS1900057	PROCUREMENT SPECIFICATION
	AR		69	MIL-S-40038-C130	SEALING COMPOUND (ES-2544-5)
SEE NOTE 7	2		67	MS21919 DG 19 THRU 21	CLAMP, CUSHIONED SUPPORT (1897073-119 THRU 121)
SEE NOTE 7	2		66	MS21919 DG 8 THRU 11	CLAMP, CUSHIONED SUPPORT (1897073-108 THRU 111)
SEE NOTE 7	1		65	MS21919 DG 7 THRU 9	CLAMP, CUSHIONED SUPPORT (1897073-107 THRU 109)
	1		64	1901304-114	NAMEPLATE, APOLLO G & N
	4		63	AN535-00-4	SCREW, DRIVE, R.HD. (1897109-004)
	1		62	1900778	WIRE LIST B B
	AR		61	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 or 2
	AR		60	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
SEE NOTE 6	8	✓	59	1016151-004	NUT, SELF LOCKING
	8		58	AN500AD4-7	SCREW, (1897012-425)
	~~X~~		~~57~~	~~ATP1900057~~	~~ASSEMBLY, TEST PROCEDURE~~
	10		56	MS-35216-26	SCREW, PAN HEAD
SEE NOTE 6	1	✓	55	1015825-014	ROTARY SWITCH
SEE NOTE 6 & 8	10	✓	54	1016005-1	SHIM, SLIDE LOCATING
SEE NOTE 7	2		53	MS21919 DG4 THRU 6.	CLAMP, CUSHIONED. SUPPORT (1897073-104 THRU 106
	1		52	1900221-031	SWITCH AND CONNECTOR ASS'Y.
SEE NOTE 6	1	✓	51	1015873-1	FUSE-HOLDER
	2		50	MS90078-7-1	FUSE (1897077-107)
SEE NOTE 6	1	✓	49	1015791-010	CHASSIS SLIDE ASSEMBLY
SEE NOTE 6	1	✓	48	1015791-009	CHASSIS SLIDE ASSEMBLY
	X		47	1900498	SCHEMATIC DIAGRAM
			46		
			45		
	1		44	1015869-336	SWITCH, PUSH BUTTON
	1		43	1015869-512	↑
	1		42	1015869-806	↑
	1		41	1015869-345	↑
	1		40	1015869-718	↑
	1		39	1015869-805	SWITCH, PUSH BUTTON
	1		38	1900096	HARNESS "A" ASSEMBLY
			37		
	14		36	MS35200-25	SCREW, MACH, FLAT CSK XRECS
	6		35	MS35200-40	SCREW, MACH, FLAT CSK XRECS
	10		34	MS91528-2K2B	KNOB (1897080-023)
SEE NOTE 6	2	✓	33	1015825-8	ROTARY SWITCH
SEE NOTE 6	1	✓	32	1015825-6	ROTARY SWITCH
SEE NOTE 6	3	✓	31	1015825-4	ROTARY SWITCH
	1		30	1900221-021	SWITCH & CONNECTOR ASSY.
	1		29	1900221-011	SWITCH & CONNECTOR ASSY.
			28		
SEE NOTE 6	1	✓	27	1015943-1	BEZEL-2 DIGIT
SEE NOTE 6	2	✓	26	1015912-193	SCREW, NYLON-FLATHEAD
	1		25	1900220	SPACER, DIGITAL READOUT
SEE NOTE 6	1	✓	24	1015844-001	DIGITAL READOUT
	2		23	MS-90078-12-1	FUSE (1897077-112)
	2		22	MS-26572-1	FUSE HOLDER-SPARE
SEE NOTE 6	1	✓	21	1015873-008	FUSE HOLDER
			20		
	18		19	AN363-C632	NUT, LOCK (1896990-261)
	1		18	1900779	HARNESS "B" ASSEM
			17		
			16		
SEE NOTE 6	10	✓	15	1015826-304	SCREW, FLAT HD., HEX SOCKET
SEE NOTE 6	1	✓	14	1015981-005	STANDOFF, HEX
	25		13	MS-35216-24	SCREW PAN HEAD
	29		12	MS-35333-71	WASHER, LOCK, INTERNAL TOOTH
	24		11	AN960C-6	WASHER, FLAT (1897006-026)
SEE NOTE 6	12	✓	10	1016000-005	HEX. SPACER
	1		9	1900224	COMPONET MOUNT ASSEMBLY
	16		8	MS-35216-25	SCREW, PAN HEAD
	1		7	1900217	TRANSFORMER & REL PNL ASSY.
	6		6	AN363C1032	NUT, SELF-LOCKING (1896990-011)
SEE NOTE 6	6		5	1006783-45	SCREW-BUTTON HEAD
SEE NOTE 6	8	✓	4	1015831-253	SCREW-FH, 100°, HEX SOCKET
	2		3	1900015-081	HANDLE ASSEMBLY
	1		2	1900210	DRAWER INSEP. ASSEMBLY
	1		1	1900209	FRONT PANEL

LIST OF PARTS AND MATERIALS

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

Ⓐ REPLACED WITH CHANGE BY REV AB
Ⓟ REPLACES REV N WITH CHANGE

SHEET 1	SHEET 2	SHEET 3
AA	AA	AA
Z	Z	U
Y	V	U
W	V	U
V	V	U
U	T	U
T	T	P
S	S	P
R	R	P
P	P	P

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

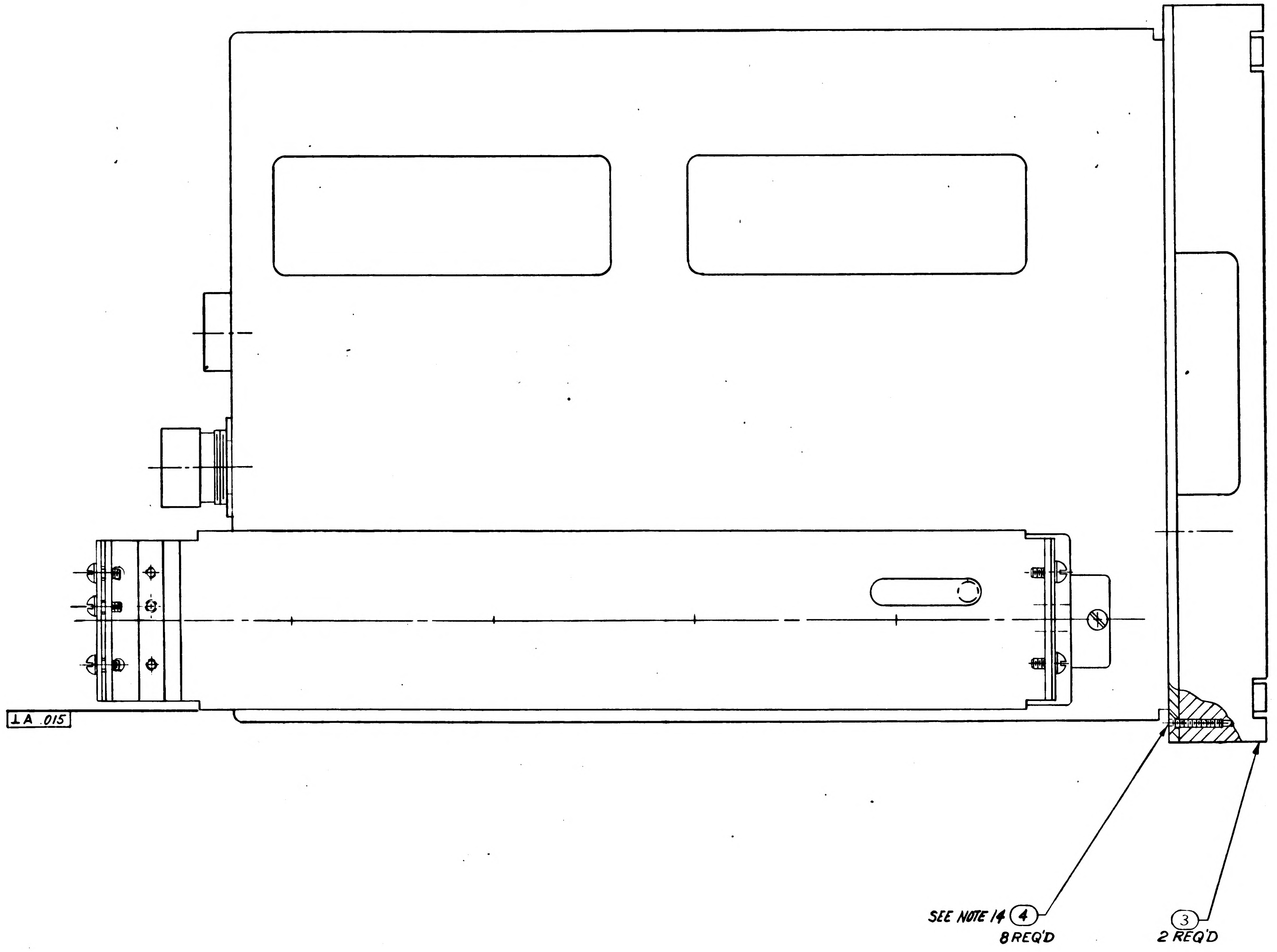
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A/Del Cuzzo DATE 5 JUN63
CHECKED 8 JUN63
APPROVAL 14 JUN63
APPROVAL
NASA APPROVAL 3-17-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO
SIZE E
1900057
SCALE 1:1
SHEET 1 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
P		REPLACES REV. N WITH CHANGE PER MXC 192013 REVISED PER TDR 06969		20 JAN 64 3-7-64	[illegible] [illegible]
U		CHANGE IN ACCORDANCE WITH CM 194149 REVISE PER TDRR 06971		5 FEB 64 3-17-64	SA JAC WK
AA		REPLACED WITH CHANGE BY REV AB PER CM 197137 REVISED PER TDR 10252	—	15 MAY 64	JJJ CP



VIEW B-B
SHEET 1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 MAY 63

Ⓐ REPLACED WITH CHANGE BY REV AB
Ⓟ REPLACES REV N WITH CHANGE

1900004-011	1900004-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE WISCONSIN
ACSP PN
DRAWN 6 JUN 63
CHECKED 8 JUN 63
APPROVAL
APPROVAL Gebiman 3/2/64
NASA APPROVAL W J Rhine 3-12-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO
SIZE E
1900057
SCALE 1:1
SHEET 3 OF 3

1900057 AA

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
AB		REPLACES REV AA WITH CHANGE PER CM 197137 REVISED PER TDR 10362	—	15 MAY 64	JJJ

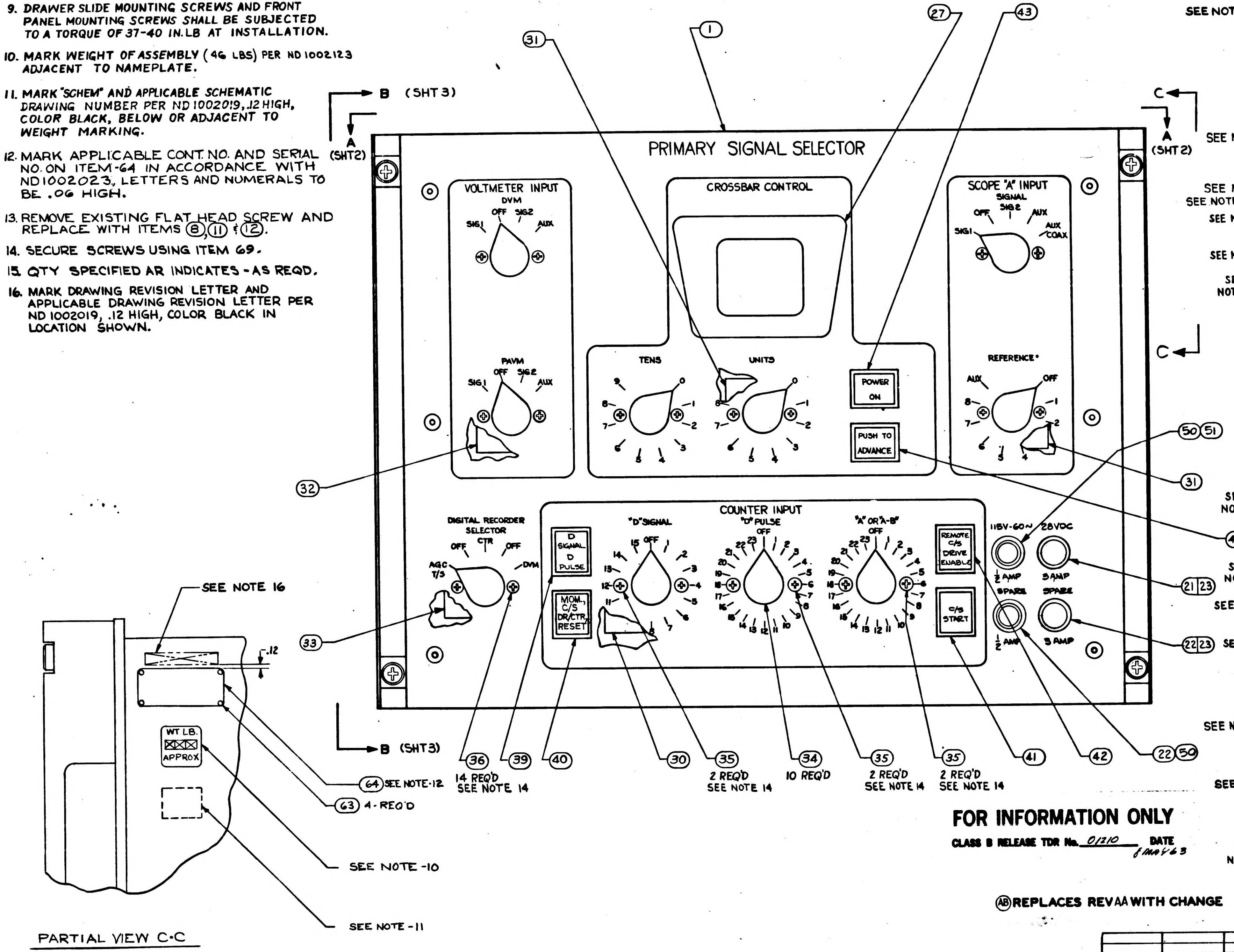
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

3. DIMENSION A SHALL BE EQUAL TO DIMENSION B WITHIN .040 IN.

4. PARTIAL REF. DESIGNATIONS ARE SHOWN: PREFIX WITH UNIT NUMBER OR SUB-ASSEMBLY DESIGNATION (S) OR BOTH FOR COMPLETE DESIGNATION.

5. *SOLDER PER MIL-STD-440 USING ITEMS 60 & 61.*
6. *VENDOR ITEM-SEE SPECIFICATION CONTROL DWG.*
7. SELECT AS REQ'D
8. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK
9. *DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO A TORQUE OF 37-40 IN.LB AT INSTALLATION.*
10. MARK WEIGHT OF ASSEMBLY (46 LBS) PER ND 1002123 ADJACENT TO NAMEPLATE.
11. *MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.*
12. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM-64 IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .06 HIGH.
13. REMOVE EXISTING FLAT HEAD SCREW AND REPLACE WITH ITEMS ⑧, ⑪ & ⑫.
14. SECURE SCREWS USING ITEM 69.
15. QTY SPECIFIED AR INDICATES - AS REQD.
16. MARK DRAWING REVISION LETTER AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.



B (SHT3)
A (SHT2)
C
A (SHT2)
C
B (SHT3)
PRIMARY SIGNAL SELECTOR
VOLTMETER INPUT
DVM
SIG1
OFF
SIG2
AUX
PAVM
CROSSBAR CONTROL
TENS
UNITS
POWER ON
PUSH TO ADVANCE
SCOPE "A" INPUT
SIGNAL
SIG2
AUX
AUX COAX
REFERENCE
DIGITAL RECORDER SELECTOR
AGC T/S
CTR
DVM
D SIGNAL D PULSE
MOM. C/S DR/CTR RESET
COUNTER INPUT
"D" SIGNAL
"D" PULSE
"A" OR "A-B"
REMOTE C/S DRIVE ENABLE
C/S START
115V-60~
28VDC
½ AMP
3 AMP
SPARE
①
㉗
㊸
㉛
㉜
㉝
(50)(51)
㉛
㊹
㉑㉓
㉒㉓
㊱ 14 REQ'D SEE NOTE 14
㊴
㊵
㉚
㉟ 2 REQ'D SEE NOTE 14
㉞ 10 REQ'D
㉟ 2 REQ'D SEE NOTE 14
㉟ 2 REQ'D SEE NOTE 14
㊶
㊷
㉒(50)
SEE NOTE 16
.12
WT LB. APPROX
(64) SEE NOTE-12
(63) 4-REQ'D
SEE NOTE-10
SEE NOTE-11

PARTIAL VIEW C-C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 MAY 63

ⒶⒷ REPLACES REV AA WITH CHANGE

					011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
					X		70	PS1900057	PROCUREMENT SPECIFICATION
					AR		69	MIL-S-40038-C130	SEALING COMPOUND (ES-2544-5)
SEE NOTE 7					2		67	MS21919 DG 19 THRU 21	CLAMP, CUSHIONED SUPPORT (1897073-119 THRU 121)
					2		66	MS21919 DG 8 THRU 11	CLAMP, CUSHIONED SUPPORT (1897073-108 THRU 111)
					1		65	MS21919 DG 7 THRU 9	CLAMP, CUSHIONED SUPPORT (1897073-107 THRU 109)
					1		64	1901304-114	NAMEPLATE, APOLLO G & N
					4		63	AN535-00-4	SCREW, DRIVE, R.HD. (1897109-004)
					1		62	1900778	WIRE LIST B B
					AR		61	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR (ES-2175 TYPE 1 or 2
					AR		60	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
SEE NOTE 6					8		59	1016151-004	NUT, SELF LOCKING
					8		58	AN500AD4-7	SCREW, (1897012-425)
							57		
					10		56	MS-35216-26	SCREW, PAN HEAD
SEE NOTE 6					1		55	1015825-014	ROTARY SWITCH
SEE NOTE 6 & 8					10		54	1016005-1	SHIM, SLIDE LOCATING
SEE NOTE 7					2		53	MS21919 DG4 THRU 6.	CLAMP, CUSHIONED, SUPPORT (1897073-104 THRU 106)
					1		52	1900221-031	SWITCH AND CONNECTOR ASS'Y.
SEE NOTE 6					1		51	1015873-1	FUSE-HOLDER
					2		50	MS90078-7-1	FUSE (1897077-107)
SEE NOTE 6					1		49	1015791-010	CHASSIS SLIDE ASSEMBLY
					1		48	1015791-009	CHASSIS SLIDE ASSEMBLY
					X		47	1900498	SCHEMATIC DIAGRAM
							46		
							45		
					1		44	1015869-336	SWITCH, PUSH BUTTON
					1		43	1015869-512	
					1		42	1015869-806	
					1		41	1015869-345	
					1		40	1015869-726	
					1		39	1015869-805	SWITCH, PUSH BUTTON
					1		38	1900096	HARNESS "A" ASSEMBLY
							37		
					14		36	MS35200-25	SCREW, MACH, FLAT CSK XRECS
					6		35	MS35200-40	SCREW, MACH, FLAT CSK XRECS
					10		34	MS91528-2K2B	KNOB (1897080-023)
SEE NOTE 6					2		33	1015825-8	ROTARY SWITCH
					1		32	1015825-6	ROTARY SWITCH
					3		31	1015825-4	ROTARY SWITCH
					1		30	1900221-021	SWITCH & CONNECTOR ASSY.
					1		29	1900221-011	SWITCH & CONNECTOR ASSY.
							28		
SEE NOTE 6					1		27	1015943-1	BEZEL-2 DIGIT
					2		26	1015912-193	SCREW, NYLON-FLATHEAD
					1		25	1900220	SPACER, DIGITAL READOUT
SEE NOTE 6					1		24	1015844-001	DIGITAL READOUT
					2		23	MS-90078-12-1	FUSE (1897077-112)
					2		22	MS-26572-1	FUSE HOLDER-SPARE
SEE NOTE 6					1		21	1015873-008	FUSE HOLDER
							20		
					18		19	AN363-C632	NUT, LOCK (1896990-261)
					1		18	1900779	HARNESS "B" ASSEM
							17		
							16		
SEE NOTE 6					10		15	1015826-304	SCREW, FLAT HD., HEX SOCKET
					1		14	1015981-005	STANDOFF, HEX
					25		13	MS-35216-24	SCREW PAN HEAD
					29		12	MS-35333-71	WASHER, LOCK, INTERNAL TOOTH
					24		11	AN960C-6	WASHER, FLAT (1897006-026)
SEE NOTE 6					12		10	1016000-005	HEX. SPACER
					1		9	1900224-011	COMPONET MOUNT ASSEMBLY
					16		8	MS-35216-25	SCREW, PAN HEAD
					1		7	1900217-011	TRANSFORMER & REL PNL ASSY.
					6		6	AN363C1032	NUT, SELF-LOCKING (1896990-011)
SEE NOTE 6					6		5	1006783-45	SCREW-BUTTON HEAD
					8		4	1015831-253	SCREW-FH, 100°, HEX SOCKET
					2		3	1900015-081	HANDLE ASSEMBLY
					1		2	1900210	DRAWER INSEP. ASSEMBLY
					1		1	1900209	FRONT PANEL
	QUANTITY REQUIRED						LIST OF PARTS AND MATERIALS		

AB	AB	AB
SHEET 1	SHEET 2	SHEET 3
REVISION STATUS OF SHEETS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

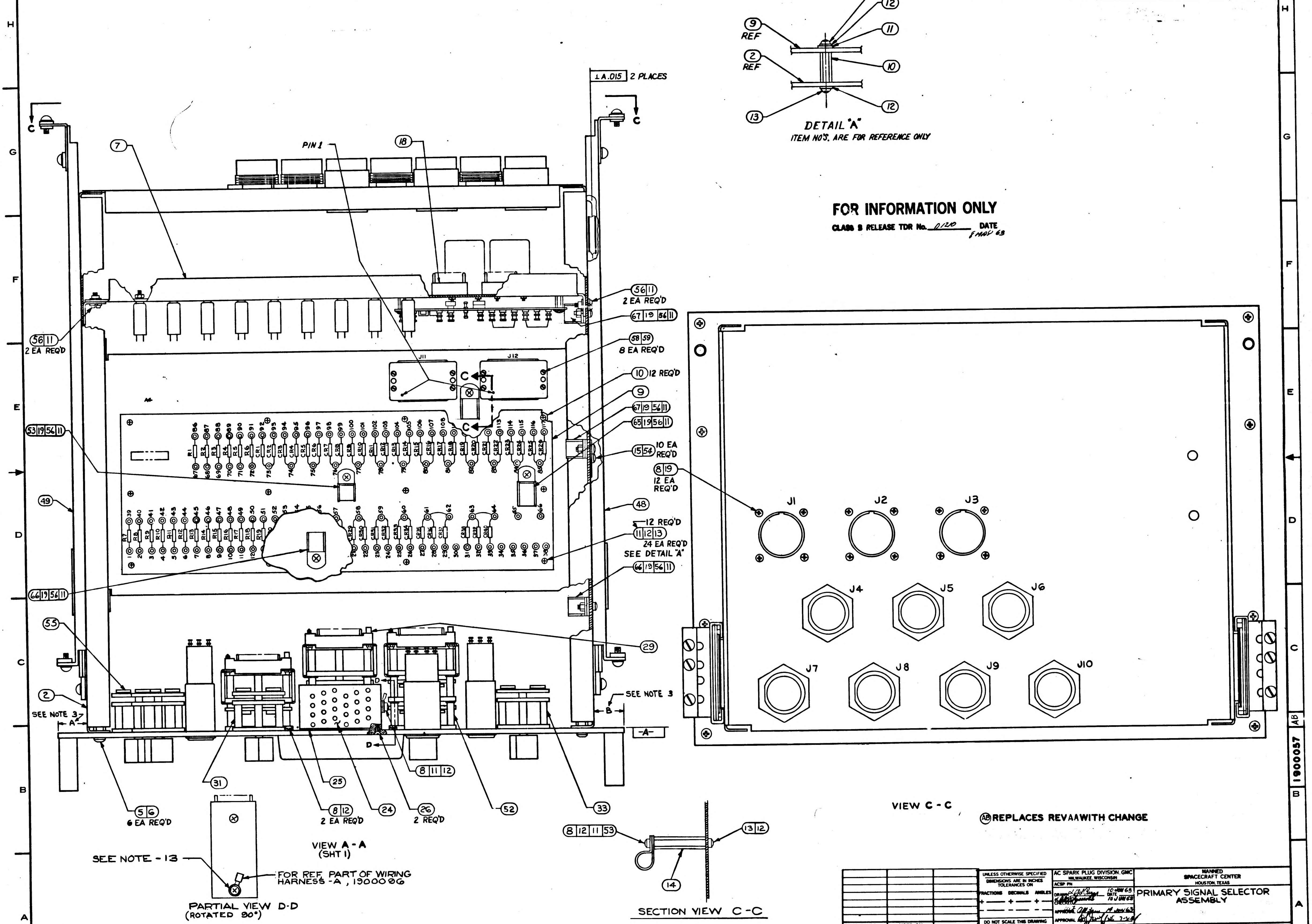
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 6 JUNE 63
CHECKED 8 JUN 63
APPROVAL 14 JUN 63
APPROVAL 7-3-64
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO. | SIZE E | 1900057
SCALE 1:1 | SHEET 1 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
AB		REPLACES REV AA WITH CHANGE PER CM 197137		15 MAY 64	JJJ
		REVISED PER TDR 10252	—	6-16-64	WK



13
12
11
10
9 REF
2 REF
PIN 1
18
7
J11
J12
C
1 A.015 2 PLACES
56 11 2 EA REQ'D
67 19 56 11
58 59 8 EA REQ'D
10 12 REQ'D
9
65 19 56 11
15 54 10 EA REQ'D
8 19 12 EA REQ'D
53 19 56 11
49
48
12 REQ'D
11 12 13 24 EA REQ'D
SEE DETAIL "A"
66 19 56 11
55
29
2
SEE NOTE 3
-A-
-B-
D
31
5 6 6 EA REQ'D
8 12 2 EA REQ'D
25
24
26 2 REQ'D
8 11 12
52
33
8 12 11 53
13 12
14
SEE NOTE - 13
FOR REF. PART OF WIRING HARNESS -A, 1900096
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10

DETAIL "A"
ITEM NO'S. ARE FOR REFERENCE ONLY

FOR INFORMATION ONLY
CLASS II RELEASE TDR No. 0120 DATE 8 MAY 63

VIEW A - A
(SHT 1)

PARTIAL VIEW D-D
(ROTATED 90°)

SECTION VIEW C-C

VIEW C - C

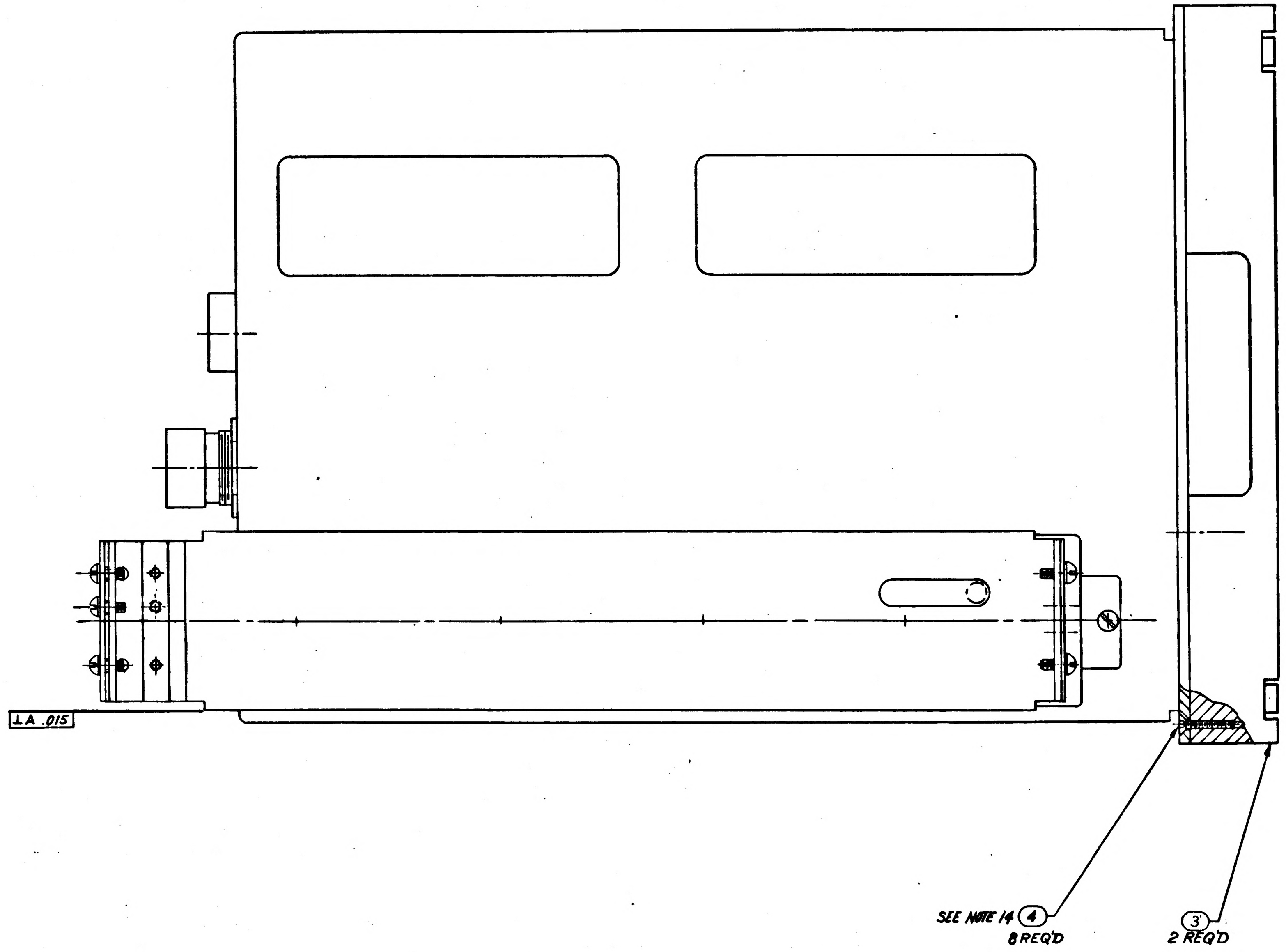
Ⓐⓑ REPLACES REV AA WITH CHANGE

MASTER

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — ± — ± — DO NOT SCALE THIS DRAWING	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	ACSP PN		
	DRAWN [illegible] DATE 10 JUN 63 CHECKED [illegible] 10 JUN 63	PRIMARY SIGNAL SELECTOR ASSEMBLY	
	APPROVAL [illegible] 14 JUN 63		
	APPROVAL [illegible] 7-2-64		
MATERIAL —	NASA APPROVAL W. J. [illegible] 5-4-64	CODE IDENT NO.	SIZE E — 1900057
CONTRACT NAS 9-497	MIT APPROVAL [illegible] 64	SCALE 1:1	SHEET 2 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION		DATE	APPD
AB		REPLACES REV. AA WITH CHANGE PER CM 197137 REVISED PER TDR 10252	CHG NO - —	15 MAY 64	JJ



VIEW B-B
SHEET 1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 MAY 63

Ⓐⓑ REPLACES REV AA WITH CHANGE

1900004-011	1900004-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 6 JUN 63
CHECKED 8 JUN 63
APPROVAL 14 JUN 63
APPROVAL 7/30/64
NASA APPROVAL
MIT APPROVAL 4 Aug 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 3 OF 3

1900057 AB

MASTER

B 1900057

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
A		KNOB MS 91528 2P2B ADDED	D0 51484	19 APR 63	WET
B		SCREW, FLAT HEAD, SOCKET, HANDLE ASSY, SLIDES ADDED TO LIST OF PARTS AND MATERIALS.		7 MAY 63	WK

PICTURE INCOMPLETE

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 **DATE** 8 May 63

						TBA	SCREW, FLAT HEAD, SOCKET
						TBA	HANDLE ASSY
						TBA	SLIDES
			10			MS91528-2P2B	KNOB
			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

1900004	1900004	011
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS + – DECIMALS + – ANGLES + –

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN W. Pluck DATE 9 APR 63
CHECKED Male Kanstar 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 5/8/63
Lester Gelerman 5/8/63
MIT APPROVAL W Kupfer 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, PRIMARY

CODE IDENT NO.

SIZE D

1900057

SCALE

SHEET

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

MIL 10750-P

1900057 C

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
REVISIONS					
A		KNOB MS 91528 2P2B ADDED	005.1484	19 APR 63	WET
B		SCREW, FLAT HEAD, SOCKET, HANDLE ASSY, SLIDES ADDED TO LIST OF PARTS AND MATERIALS.		7 MAY 63	WK
B1		CHANGE IN ACCORDANCE WITH MXC 186288	MXC 186288	20 MAY 63	PHG WS
B2		CHANGE IN ACCORDANCE WITH MXC 186524	MXC 186524	20 MAY 63	PHG WS.
B3		CHANGE IN ACCORDANCE WITH MXC-186811	MXC 186811	24 MAY 63	RGB A.R.R.
B4		CHANGE IN ACCORDANCE WITH MXC 186965		11 JUN 63	GEH RW
C		REPLACED WITH CHANGE BY REVISION "D" PER MXC 187471		26 JUN 63	LG ARS

TDRR 02175 7/24/63 WK

PICTURE INCOMPLETE

FOR INFORMATION ONLY

Ⓒ CLASS B RELEASE TDR No. 01210 DATE 8 May 63

REPLACED WITH CHANGE BY REVISION "D" PER MXC 187471

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			MS90078-12-1	FUSE, STYLE F02
			1			1015873-008	FUSE HOLDER, INDICATING
			1			1015825-14	SWITCH ROTARY
			1			1015943-001	BEZEL, TWO DIGIT
			2			1015825-008	SWITCH, ROTARY
			42			IN459	SEMICONDUCTOR DEVICE, DIODE
			24			RC20GF244J	RESISTOR-FIXED
			1			MS 26572-1	FUSEHOLDER
			1			-104	
			1			-103	
			1			-102	
			2			1015906-101	CONNECTOR RECP, ELEC
			70			1015908-51	COAXIAL-HYRING
			70			1015908-31	COAXIAL-OUTER FEMALE BODY
			70			1015908-11	COAXIAL-PIN CONTACT
			2			1015906-100	CONNECTOR RECP, ELEC

LIST OF PARTS AND MATERIALS

QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
			1			MS3127E-24-61PX	CONNECTOR RECP, ELEC
			1			MS3127E-24-61PW	CONNECTOR RECP, ELEC
			1			MS3127E-24-61P	CONNECTOR RECP, ELEC
			2			1015867-660	CONNECTOR-SOCKET CONTACTS
			2			1015868-660	CONNECTOR-PIN CONTACTS
			348			1015818-424	CONNECTOR-SOCKET CONTACTS
			6			1015818-660	CONNECTOR-PLUG ELEC
			348			1015817-424	CONNECTOR-PIN CONTACTS
			36			1015802-004	RELAY
			2			1015842	TRANSFORMER
			3			1015846	TRANSFORMER
			6			1015817-660	CONNECTOR-RECP, ELEC
			3			1015825-004	SWITCH, ROTARY
			1			1015825-006	SWITCH, ROTARY
			1			1015825-003	SWITCH, ROTARY
			2			1015825-002	SWITCH, ROTARY
			1			1015844-001	READOUT, DIGITAL
			2			1900015-081	HANDLE ASSY
			1			1015785-010	CHASSIS SLIDE ASSY
			1			1015785-009	CHASSIS SLIDE ASSY
						TBA	SCREW, FLAT HEAD, SOCKET
						TBA	HANDLE ASSY
						TBA	SLIDES
			10			MS 91528-2K2B	KNOB

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
+	+	+
−	−	−

DO NOT SCALE THIS DRAWING

MATERIAL

CONTRACT NAS-9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN W. Dick DATE 9 APR 63
CHECKED Mal Kanstai 10 APR 63
APPROVAL 10 APR 63
APPROVAL 10 APR 63
NASA APPROVAL 5/8/63
Lester Gedinman 5/8/63
MIT APPROVAL 8 May 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

SELECTOR, SIGNAL, PRIMARY

CODE IDENT NO.
SIZE D
1900057
SCALE
SHEET

MIL 10780-P

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

1▷ IDENTIFY USING DRAWING NUMBER AND REVISION LETTER PER MIL-STD-130 (ES-267)

THE FRONT PANEL AND DRAWER INSEP. ASSEMBLY ARE TO BE CENTRALIZED WITHIN .010 AT ASSEMBLY.

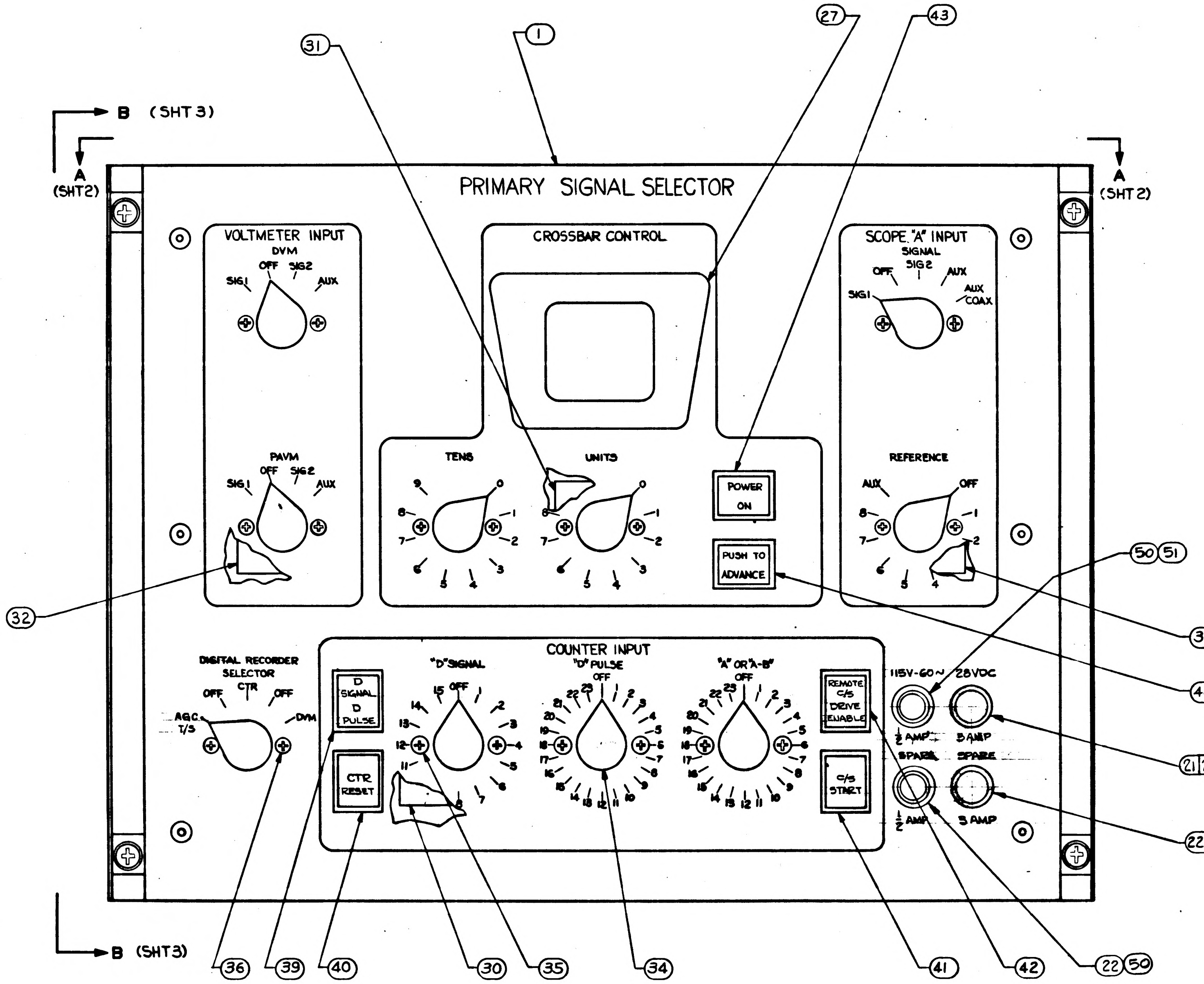
PARTIAL REF. DESIGNATIONS ARE SHOWN: PREFIX WITH UNIT NUMBER OR SUB-ASSEMBLY DESIGNATION (S) OR BOTH FOR COMPLETE DESIGNATION.

2▷ VENDOR ITEM - SEE SPECIFICATION CONTROL DWG.

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
D		REPLACES REVISION C WITH CHANGE PER MXC187471 ADDED SHEETS 1 AND 2	62 75	25 JUL 63	

D	D	D
SHEET 1	SHEET 2	SHEET 3

REVISION STATUS OF SHEETS



31
1
27
43
B (SHT 3)
A (SHT2)
A (SHT2)
PRIMARY SIGNAL SELECTOR
VOLTMETER INPUT
DVM
SIG1
OFF
SIG2
AUX
PAVM
SIG1
OFF
SIG2
AUX
CROSSBAR CONTROL
TENS
UNITS
POWER ON
PUSH TO ADVANCE
SCOPE "A" INPUT
SIGNAL
OFF
SIG2
AUX
SIG1
AUX COAX
REFERENCE
AUX
OFF
32
50 51
31
44
DIGITAL RECORDER SELECTOR
OFF
CTR
OFF
AGC T/S
DVM
COUNTER INPUT
D SIGNAL D PULSE
CTR RESET
"D" SIGNAL
"D" PULSE
"A" OR "A-B"
OFF
REMOTE C/S DRIVE ENABLE
C/S START
115V-60~
28VDC
½ AMP
3 AMP
SPARE
SPARE
½ AMP
3 AMP
21 23
22 23
B (SHT3)
36
39
40
30
35
34
41
42
22 50

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 **DATE** 8 May 63

Ⓓ REPLACES REVISION "C" WITH CHANGE PER MXC187471

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
2▷	1		51	1015873-1	FUSE-HOLDER
	2		50	MS90078-7-1	FUSE
2▷	1		49	1015791-010	CHASSIS SLIDE ASSEMBLY
2▷	1		48	1015791-009	CHASSIS SLIDE ASSEMBLY
			47		
			46		
			45		
	1		44	1015869-	SWITCH, PUSH BUTTON
	1		43	↑	↑
	1		42		
	1		41		
	1		40		
	1		39	1015869-	SWITCH, PUSH BUTTON
	1		38	1900096	HARNESS "A" ASSEMBLY
	12		37	MS20365-632	NUT-LOCK
	14		36	MS35200-25	SCREW, MACH, FLAT CSK XRECS
	6		35	MS35200-40	SCREW, MACH, FLAT CSK XRECS
	10		34	MS91528-2K2B	KNOB
2▷	2		33	1015825-8	ROTARY SWITCH
2▷	2		32	1015825-6	ROTARY SWITCH
2▷	3		31	1015825-4	ROTARY SWITCH
	1		30	1900221-021	SWITCH & CONNECTOR ASSY.
	2		29	1900221-011	SWITCH & CONNECTOR ASSY.
	2		28	MS35216-27	SCREW, PAN HEAD
2▷	1		27	1015943-1	BEZEL-2 DIGIT
2▷	2		26	1015912-193	SCREW, NYLON-FLATHEAD
	1		25	1900220	SPACER, DIGITAL READOUT
2▷	1		24	1015844-001	DIGITAL READOUT
	2		23	MS-90078-12-1	FUSE
	2		22	MS-26572-1	FUSE HOLDER-SPARE
2▷	1		21	1015873-008	FUSE HOLDER
	1		20	1900272	TRANSFORMER MOUNT ASSY.
	2		19	MS-20365-632	NUT, LOCK
	1		18		HARNESS "B" ASSEM
	1		17	MS-25281-	CLAMP-LOOP
2▷	2		16	1015868	CONNECTOR PLUG-ELECT.
	1		15	MS-25281-	CLAMP-LOOP
	2		14		WASHER-SADDLE
	24		13	MS-35216-23	SCREW PAN HEAD
	26		12	MS-35338	WASHER, LOCK
	8		11	AN960C	WASHER, FLAT
	12		10		HEX. SPACER
	1		9	1900224	COMPONET MOUNT ASSEMBLY
	16		8	MS-35216-25	SCREW, PAN HEAD
	1		7	1900217	TRANSFORMER & REL PNL ASSY.
	6		6	AN363C1032	NUT, SELF-LOCKING
	6		5	1006783-45	SCREW-BUTTON HEAD
2▷	8		4	1015831-257	SCREW-FH, 100°, HEX SOCKET
	2		3	1900015-081	HANDLE ASSEMBLY
	1		2	1900210	DRAWER INSEP. ASSEMBLY
	1		1	1900209	FRONT PANEL

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900C04	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN a/Del Rizzo DATE 6 JUN63
CHECKED 8 JUN63
APPROVAL McBean 14 JUN63
APPROVAL L Gehman 7/23/63
NASA APPROVAL 7/29/63
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET OF 3

1900057 D

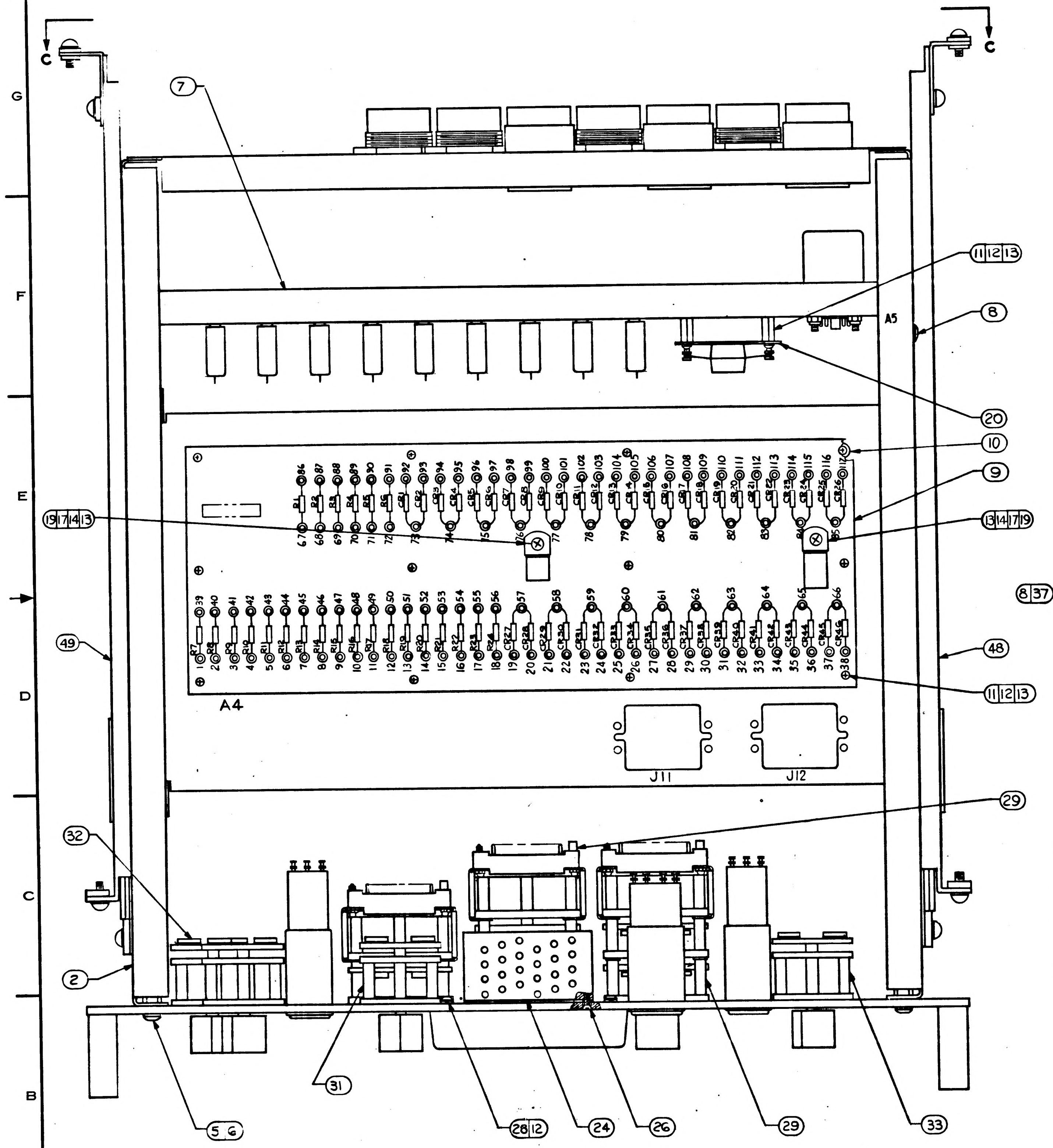
1900057

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
			2175		

REV D

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1210 DATE 7 May 63



C
C
7
11 12 13
8
A5
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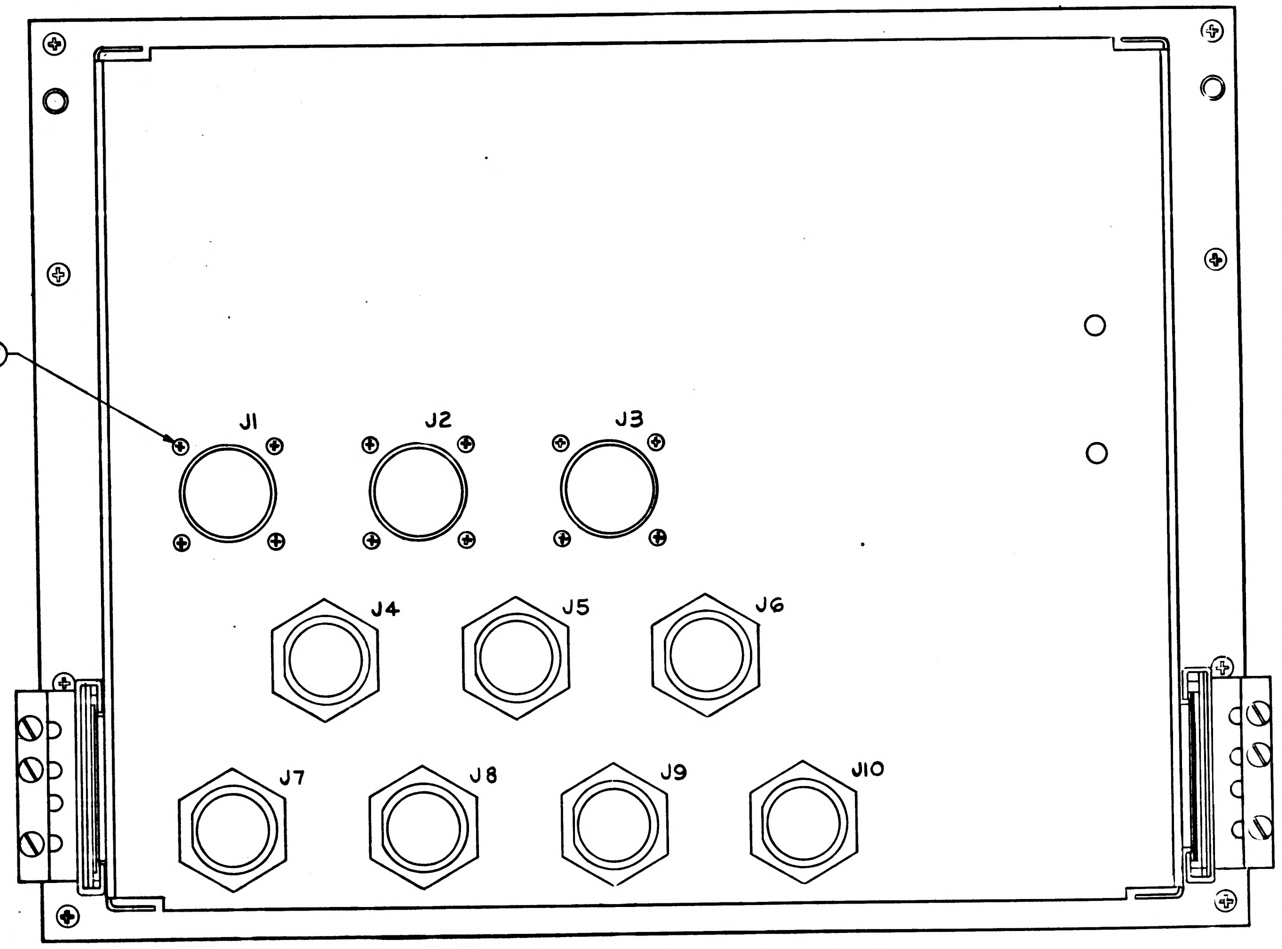
9
19 17 14 13
13 14 17 19
49
48
11 12 13
A4
J11
J12
29
32
2
31
5 6
28 12
24
26
29
33

VIEW A - A
(SHT 1)



8 37
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10

VIEW C - C

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L.J.L. Curry DATE 10 JUN 63
CHECKED 10 JUN 63
APPROVAL W.T. McGroy 14 JUN 63
APPROVAL L. Gedimon 7/23/63
NASA APPROVAL 7/26/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

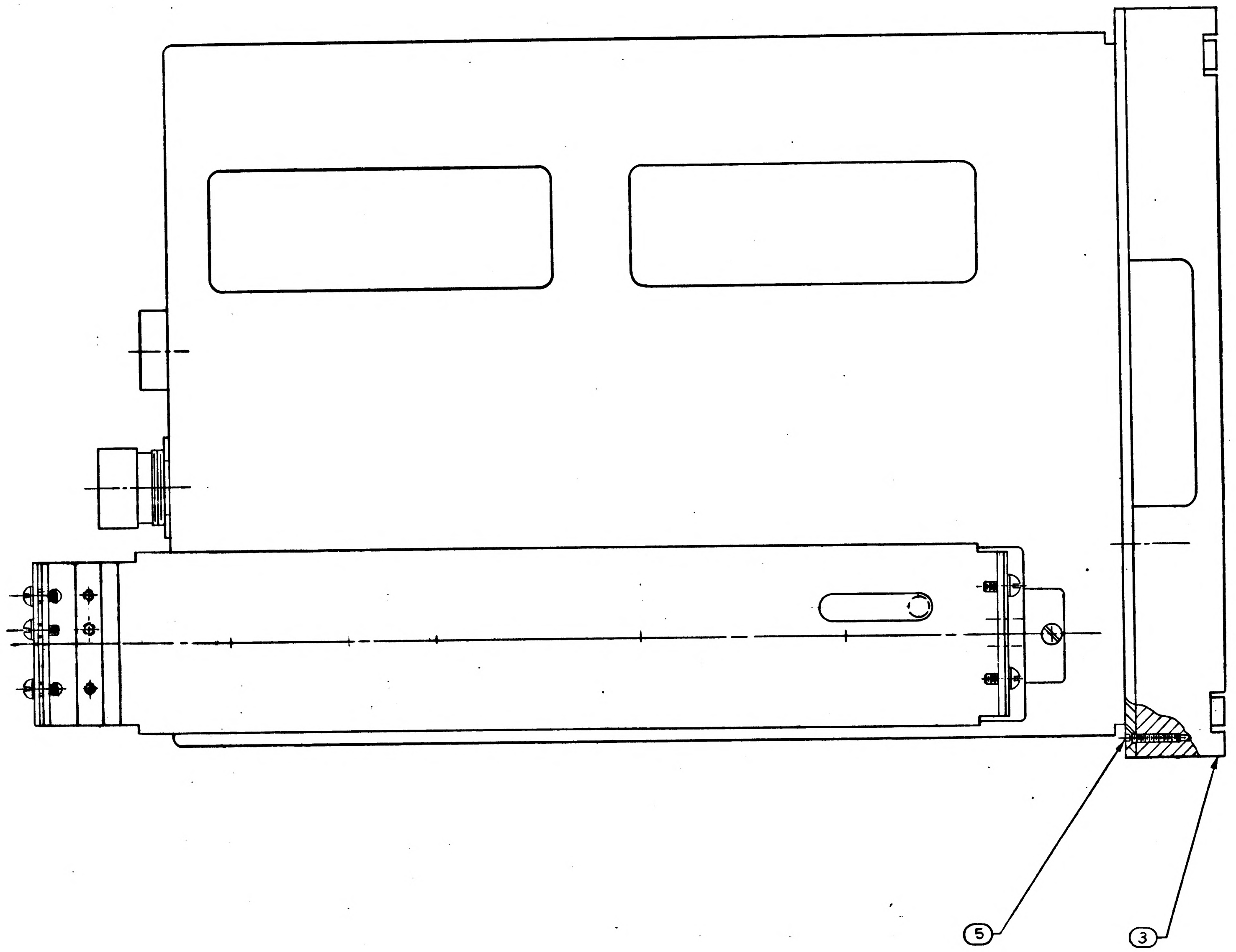
PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 2 OF 3

INCHES
0 1 2
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
			02175	7-16-63	WR

REV D



VIEW B-B
SHEET 3

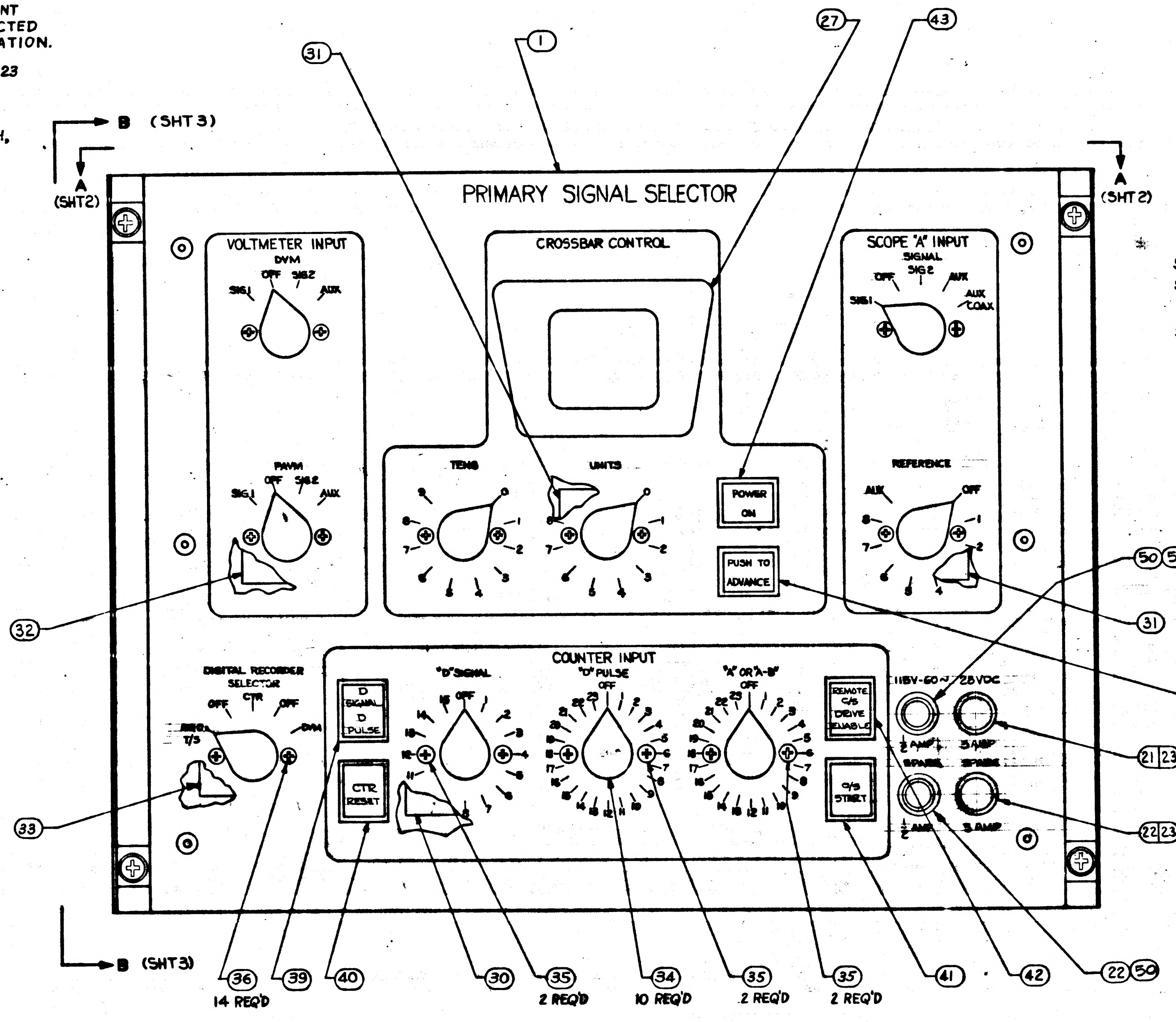
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0120 **DATE** 6 May 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		
THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± — DECIMALS ± — ANGLES ± —	AC SPARK PLUG DIVISION, GMC MILWAUKEE, WISCONSIN	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	ACSP PN	PRIMARY SIGNAL SELECTOR ASSEMBLY	
	DRAWN 6 JUN 63		
	CHECKED 8 JUN 63		
	APPROVAL W. W. Bray 14 JUN 63		
DO NOT SCALE THIS DRAWING	APPROVAL L. Gediman 7/23/63		
MATERIAL —	NASA APPROVAL 7/16/63	CODE IDENT NO.	SIZE E · 1900057
CONTRACT NAS 9-497	MIT APPROVAL W. Kupfer 24 July 63	SCALE 1:1	SHEET 3 OF 3

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2 SERIALIZE PER ND 1002023.
3. THE FRONT PANEL AND DRAWER INSEP. ASSEMBLY ARE TO BE CENTRALIZED WITHIN .010 AT ASSEMBLY.
4. PARTIAL REF. DESIGNATIONS ARE SHOWN: PREFIX WITH UNIT NUMBER OR SUB-ASSEMBLY DESIGNATION (S) OR BOTH FOR COMPLETE DESIGNATION.
5 SOLDER PER MIL-STD-440 USING ITEMS 60 & 61.
6. VENDOR ITEM-SEE SPECIFICATION CONTROL DWG.
7. SELECT AS REQ'D
8 SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK
9. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO A TORQUE OF 37-40 IN.LB AT INSTALLATION.
10. MARK WEIGHT OF ASSEMBLY PER ND1002123 ADJACENT TO NAMEPLATE.
11. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.



REVISION STATUS OF SHEETS		
J	J	J
H	H	D
G	G	D
F	F	D
E	E	D
SHEET 1	SHEET 2	SHEET 3

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		REPLACES REVISION 'C' WITH CHANGE PER MXC187471 ADDED SHEETS 1 AND 2	275	25 JUL 63	
E		CHANGE IN ACCORDANCE WITH MXC-187964.		6 AUG 63	A.M.D.
F		CHANGE IN ACCORDANCE WITH MXC-188650		26 AUG 63	J.J.J.
G		CHANGED IN ACCORDANCE WITH MXC-189124		5 SEP 63	E.L.
H		CHANGED IN ACCORDANCE WITH MXC-189922 REVISION STATUS CHANGED		18 SEP 63	A.N.
J		CHANGE IN ACCORDANCE WITH MXC-190920 REVISED PER TDR 04479		30 SEC 63	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

Ⓓ REPLACES REV C WITH CHANGE

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				1		62	1900778	WIRE LIST BB
				AR		61	MIL-F-14256	FLUX (ES-2798)
							QQ-S-571	FLUX TYPE AR (ES-2175 TYPE 1 OP 2)
				AR		60	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				8		59	1016151-004	NUT, SELF LOCKING
				8		58	AN500AD4-6	SCREW, FILLISTER HEAD
				X		57	ATP-1900057	ASSEMBLY TEST PROCEDURE
				6		56	MS-35216-26	SCREW, PAN HEAD
				1		55	1015825-014	ROTARY SWITCH
SEE NOTE 8				10		54	1016005-1	SHIM, SLIDE LOCATING
SEE NOTE 7				8		53	MS21919DG-4 THRU MS21919DG-21	CLAMP, CUSHIONED, SUPPORT
				1		52	1900221-031	SWITCH AND CONNECTOR ASS'Y.
SEE NOTE 6				1		51	1015873-1	FUSE-HOLDER
				2		50	MS90078-7-1	FUSE
SEE NOTE 6				1		49	1015791-010	CHASSIS SLIDE ASSEMBLY
				1		48	1015791-009	CHASSIS SLIDE ASSEMBLY
				X		47	1900498	SCHEMATIC DIAGRAM
						46		
						45		
				1		44	1015869-336	SWITCH, PUSH BUTTON
				1		43	1015869-512	
				1		42	1015869-806	
				1		41	1015869-345	
				1		40	1015869-718	
				1		39	1015869-805	SWITCH, PUSH BUTTON
				1		38	1900096	HARNESS "A" ASSEMBLY
						37		
				14		36	MS35200-25	SCREW, MACH, FLAT CSK XRECS
				6		35	MS35200-40	SCREW, MACH, FLAT CSK XRECS
				10		34	MS91528-2K2B	KNOB
SEE NOTE 6				2		33	1015825-8	ROTARY SWITCH
				1		32	1015825-6	ROTARY SWITCH
				3		31	1015825-4	ROTARY SWITCH
				1		30	1900221-021	SWITCH & CONNECTOR ASSY.
				1		29	1900221-011	SWITCH & CONNECTOR ASSY.
						28		
SEE NOTE 6				1		27	1015943-1	BEZEL-2 DIGIT
				2		26	1015912-193	SCREW, NYLON-FLATHEAD
				1		25	1900220	SPACER, DIGITAL READOUT
SEE NOTE 6				1		24	1015844-001	DIGITAL READOUT
				2		23	MS-90078-12-1	FUSE
				2		22	MS-26572-1	FUSE HOLDER-SPARE
SEE NOTE 6				1		21	1015873-008	FUSE HOLDER
						20		
				14		19	AN363-C632	NUT, LOCK
				1		18	1900779	HARNESS "B" ASSEM
						17		
						16		
						15		
						14		
				24		13	MS-35216-24	SCREW PAN HEAD
				26		12	MS-35333-71	WASHER, LOCK, INTERNAL TOOTH
				16		11	AN960C-6	WASHER, FLAT
				12		10	1016000-005	HEX. SPACER
				1		9	1900224	COMPONET MOUNT ASSEMBLY
SEE NOTE 6				24		8	MS-35216-25	SCREW, PAN HEAD
				1		7	1900217	TRANSFORMER & REL PNL ASSY.
				6		6	AN363C1032	NUT, SELF-LOCKING
				6		5	1006783-45	SCREW-BUTTON HEAD
				8		4	1015831-257	SCREW-FH, 100°, HEX SOCKET
				2		3	1900015-081	HANDLE ASSEMBLY
				1		2	1900210	DRAWER INSEP. ASSEMBLY
				1		1	1900209	FRONT PANEL

QUANTITY REQUIRED

LIST OF PARTS AND MATERIALS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 6 JUNE 63
CHECKED 8 JUN 63
APPROVAL 14 JUN 63
APPROVAL 7/23/63
NASA APPROVAL
MIT APPROVAL

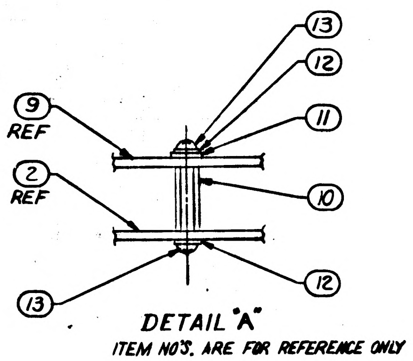
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 1 OF 3

1900057

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		CHANGE IN ACCORDANCE WITH MXC-188650		26 AUG 63	J.J.J.
G		CHANGE IN ACCORDANCE WITH MXC-189124		28 AUG 63	J.E.L.
H		CHANGE IN ACCORDANCE WITH MXC-189922		18 SEP 63	A.N.
J		CHANGE IN ACCORDANCE WITH MXC-190920 PER TDRR 00478		29 OCT 63	



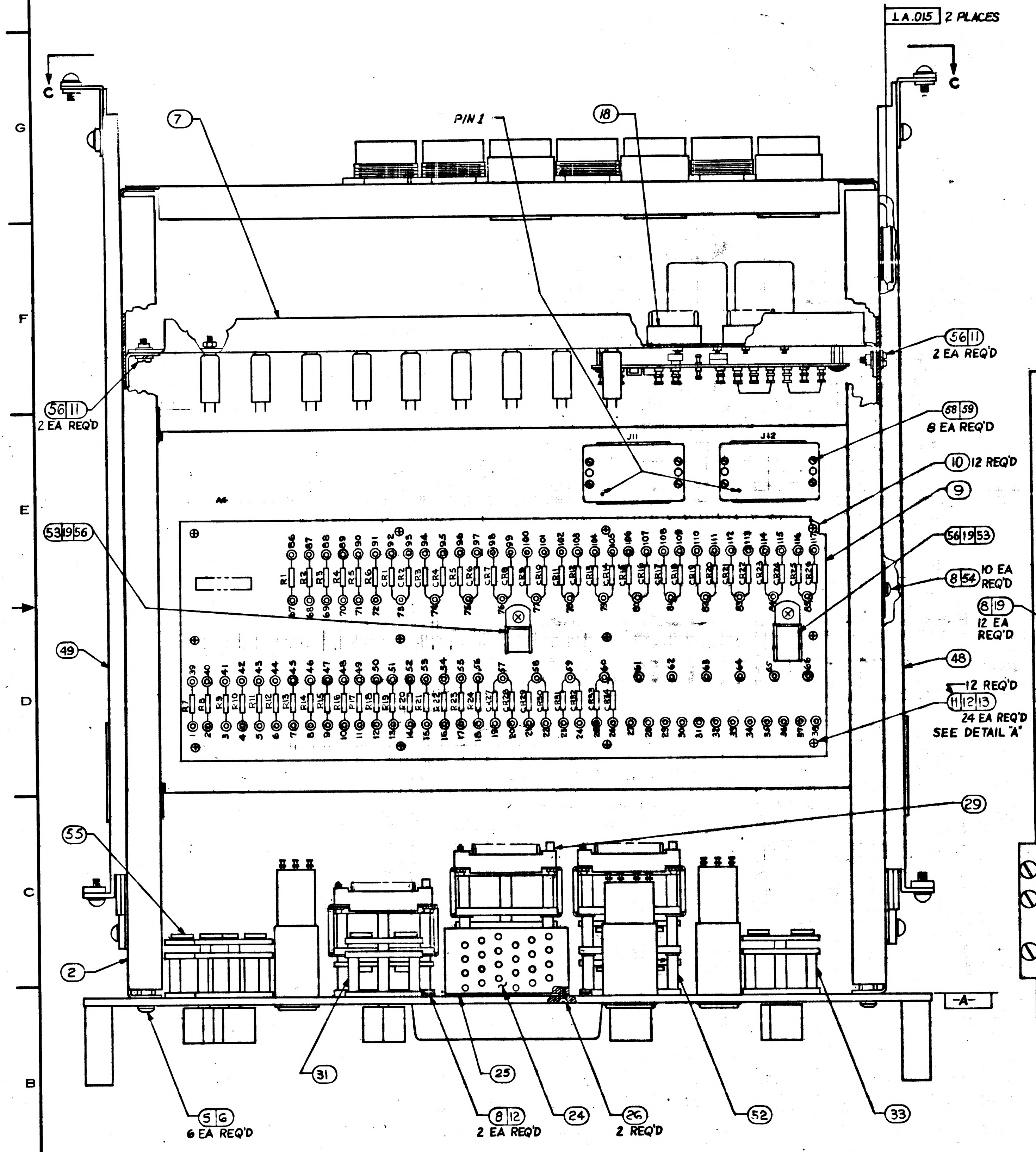
13
12
11
10
12
13
9 REF
2 REF

DETAIL "A"

ITEM NO'S. ARE FOR REFERENCE ONLY

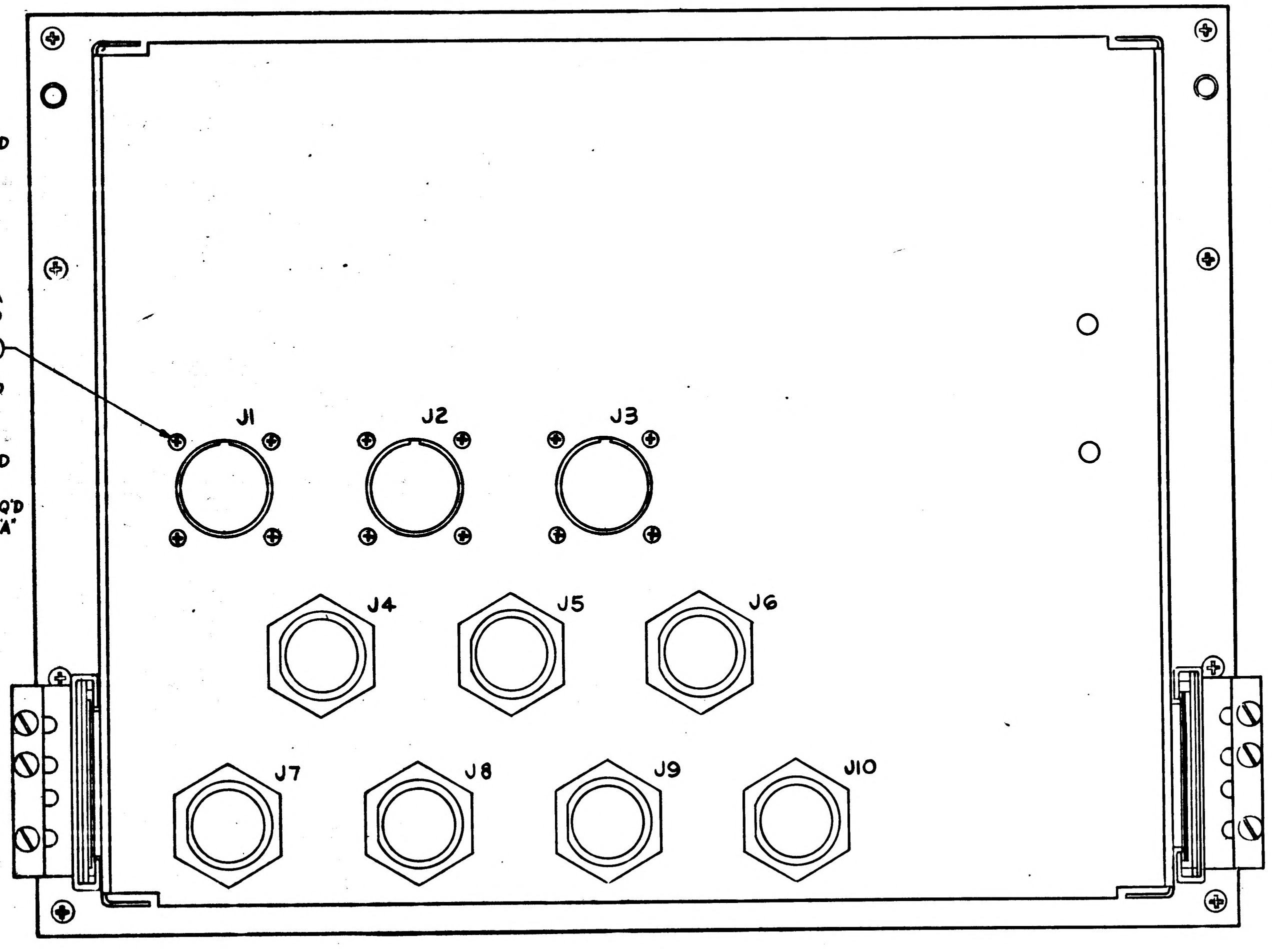
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. C1210 DATE 7 May 63



⊥ A.015 2 PLACES
C
C
7
PIN 1
18
56 11 2 EA REQ'D
56 11 2 EA REQ'D
58 59 8 EA REQ'D
J11
J12
10 12 REQ'D
9
53 19 56
56 19 53
8 54 10 EA REQ'D
8 19 12 EA REQ'D
49
48
12 REQ'D
11 12 13 24 EA REQ'D SEE DETAIL "A"
29
55
2
-A-
31
25
5 6 6 EA REQ'D
8 12 2 EA REQ'D
24
26 2 REQ'D
52
33

VIEW A - A
(SHT 1)



J1
J2
J3
J4
J5
J6
J7
J8
J9
J10

VIEW C - C

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING. NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION. GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 10 JUN 63
CHECKED DATE 10 JUN 63
APPROVAL A.M. Bray 14 JUN 63
APPROVAL L. Gelman 7/23/63
NASA APPROVAL 7/29/63
MIT APPROVAL

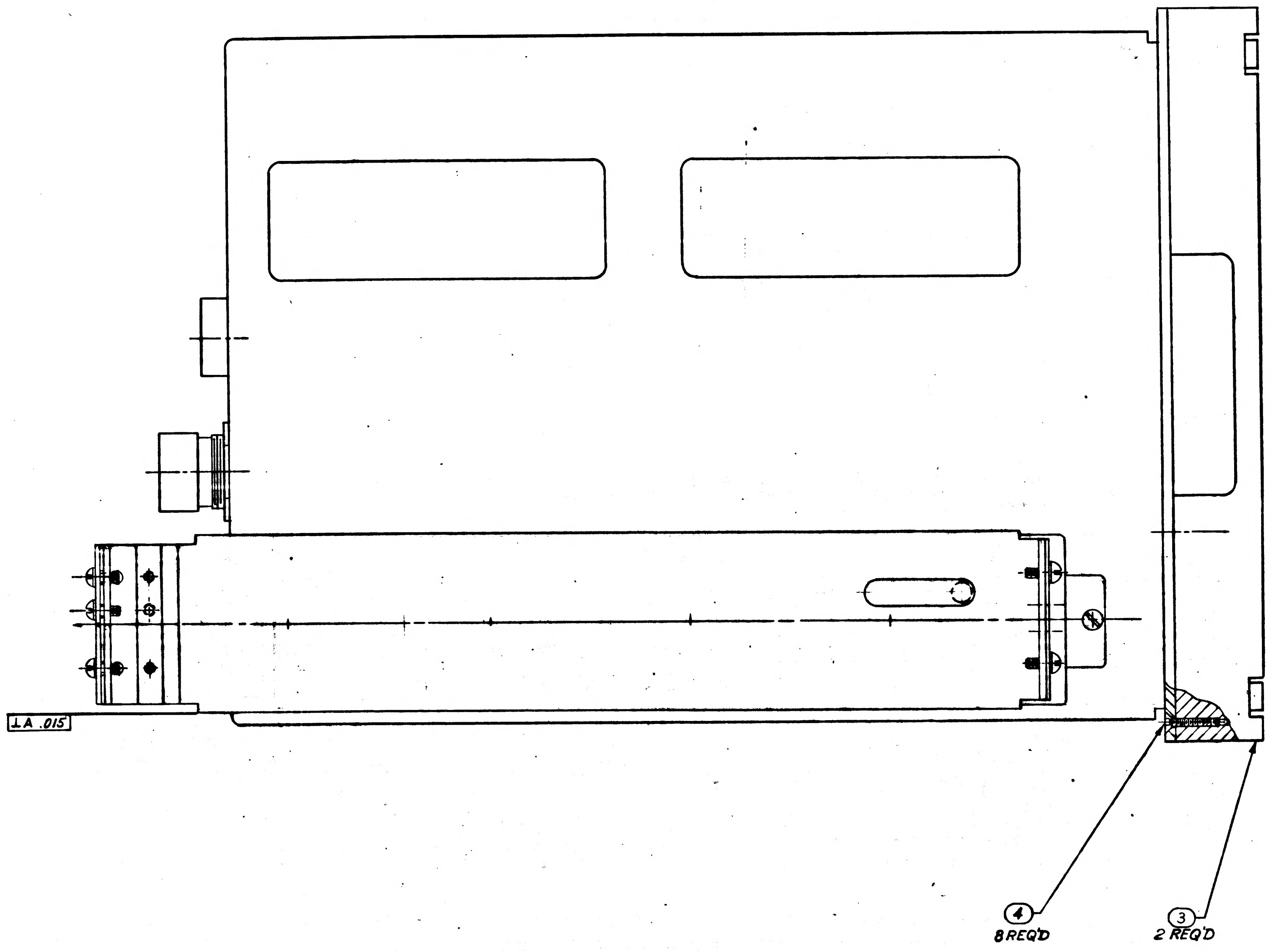
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO. SIZE E 1900057
SCALE 1:1 SHEET 2 OF 3

REV D

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
			02175	[illegible]	WK
J		CHANGE IN ACCORDANCE WITH MXC 190920 PER TDRR 04978		28 OCT 63 [illegible] 63	M.M. 2[illegible] WK



VIEW B-B
SHEET 1

FOR INFORMATION ONLY
CLASS B RELEASE TDR No. 01210 DATE 8 May 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 6 JUN 63
CHECKED [illegible] 7 JUN 63
APPROVAL A. M. Bray 14 JUN 63
APPROVAL L. Gediman 7/23/63
NASA APPROVAL [illegible] 7/29/63
MIT APPROVAL W. [illegible] 24 Jul 63

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 3 OF 3

1900057 J

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SERIALIZE PER ND 1002023.
3. THE FRONT PANEL AND DRAWER INSEP. ASSEMBLY ARE TO BE CENTRALIZED WITHIN .010 AT ASSEMBLY.
4. PARTIAL REF. DESIGNATIONS ARE SHOWN: PREFIX WITH UNIT NUMBER OR SUB-ASSEMBLY DESIGNATION (S) OR BOTH FOR COMPLETE DESIGNATION.
5. SOLDER PER MIL-STD-440 USING ITEMS 60 & 61.
6. VENDOR ITEM-SEE SPECIFICATION CONTROL DWG.
7. SELECT AS REQ'D
8. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK.
9. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO A TORQUE OF 37-40 IN.LB AT INSTALLATION.
10. MARK WEIGHT OF ASSEMBLY PER ND 1002123 ADJACENT TO NAMEPLATE.
11. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
N		REPLACED WITH CHANGE BY REV. P PER MXC 19?018 REVISED PER TDRR 04964			
L		CHANGE IN ACCORDANCE WITH MXC - 190927	—	10 JAN 64	
M		REVISION STATUS CHANGED PER MXC - 191491	—	13 JAN 64	

SHEET 1	SHEET 2	SHEET 3
N	N	N
M	M	J
L	J	J
K	J	J
J	J	J
H	H	D
G	G	D
F	F	D
E	E	D

REVISION STATUS OF SHEETS

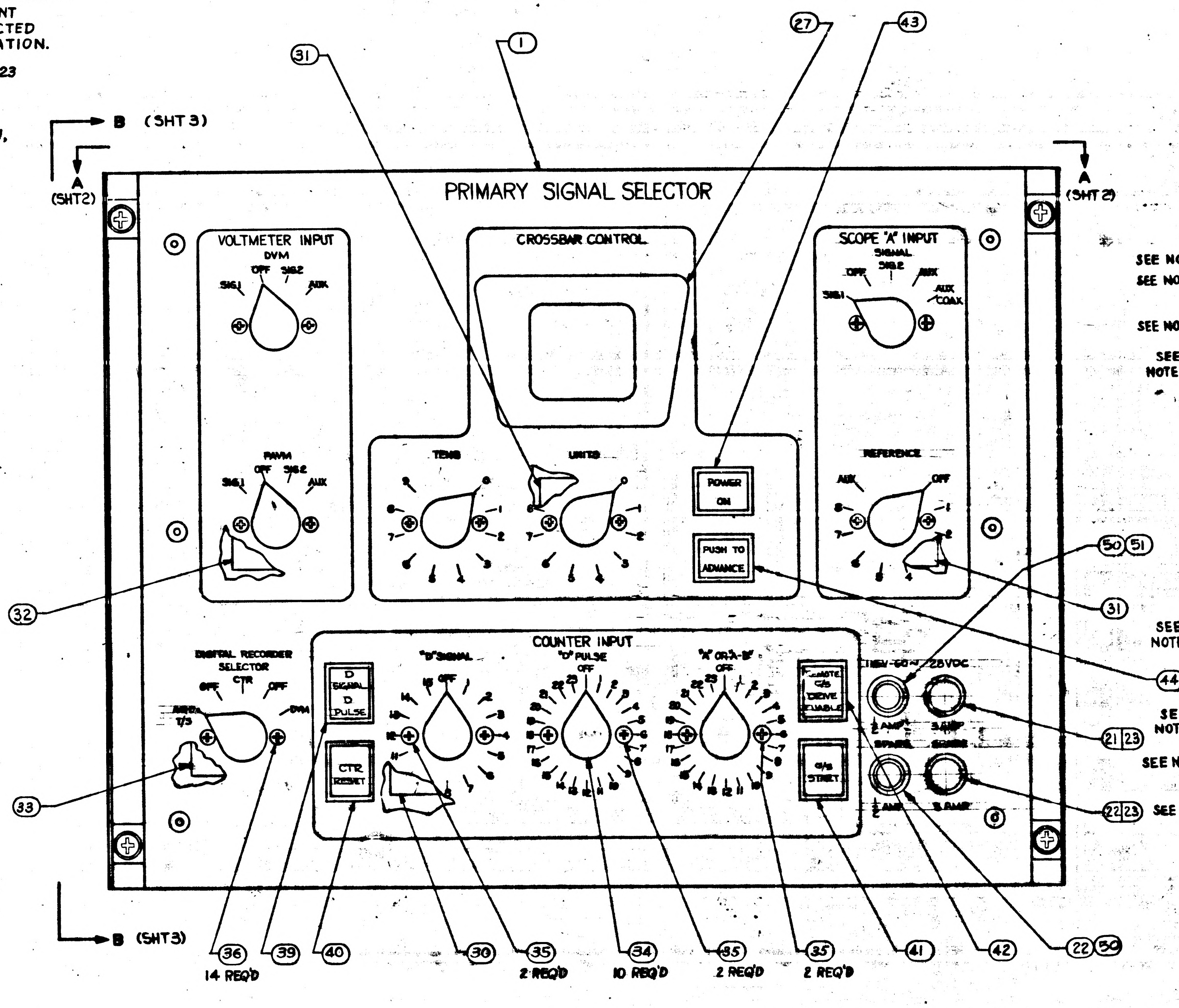
REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
D		REPLACES REVISION C WITH CHANGE PER MXC 187471 ADDED SHEETS 1 AND 2	TDRR 02175	25 JUL 63	
E		CHANGE IN ACCORDANCE WITH MXC-187964		5 AUG 63	Y.A.M.D.
F		CHANGE IN ACCORDANCE WITH MXC-188650		26 AUG 63	J.J.J.
G		CHANGED IN ACCORDANCE WITH MXC-189124		5 SEP 63	J.E.L.
H		CHANGED IN ACCORDANCE WITH MXC-189322 REVISION STATUS CHANGED		18 SEP 63	A.N.
J		CHANGE IN ACCORDANCE WITH MXC-190920 REVISED PER TDRR 04979			
K		CHANGE PREVIOUSLY ACCOMPLISHED - MXC 190921 PER TDRR 06968		8 JAN 64 3-17-66	

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 0120 DATE 8 May 63

Ⓓ REPLACES REV C WITH CHANGE



N REPLACED WITH CHANGE BY REV. P

LIST OF PARTS AND MATERIALS

	QUANTITY REQUIRED 011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	1		64	1900705	NAMEPLATE, APOLLO, G&N
	4		63	AN535-00-4	SCREW, DRIVE, ROUND HEAD
	1		62	1900778	WIRE LIST BB
	AR		61	MIL-F-14256	FLUX (ES-2798)
				QQ-S-571	FLUX TYPE AR (ES-2175 TYPE 1 OR 2)
	AR		60	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
	8		59	1016151-004	NUT, SELF LOCKING
	8		58	AN500AD4-6	SCREW, FILLISTER HEAD
	X		57	ATP-1900057	ASSEMBLY TEST PROCEDURE
	6		56	MS-35216-26	SCREW, PAN HEAD
	1		55	1015825-014	ROTARY SWITCH
SEE NOTE 8	10		54	1016005-1	SHIM, SLIDE LOCATING
SEE NOTE 7	8		53	MS21919DG-4 THRU MS21919DG-21	CLAMP, CUSHIONED, SUPPORT
	1		52	1900221-031	SWITCH AND CONNECTOR ASS'Y.
SEE NOTE 6	1		51	1015873-1	FUSE-HOLDER
	2		50	MS90078-7-1	FUSE
SEE NOTE 6	1		49	1015791-010	CHASSIS SLIDE ASSEMBLY
	1		48	1015791-009	CHASSIS SLIDE ASSEMBLY
	X		47	1900498	SCHEMATIC DIAGRAM
			46		
			45		
	1		44	1015869-336	SWITCH, PUSH BUTTON
	1		43	1015869-512	
	1		42	1015869-806	
	1		41	1015869-345	
	1		40	1015869-718	
	1		39	1015869-805	SWITCH, PUSH BUTTON
	1		38	1900096	HARNESS "A" ASSEMBLY
			37		
	14		36	MS35200-25	SCREW, MACH, FLAT CSK XRECS
	6		35	MS35200-40	SCREW, MACH, FLAT CSK XRECS
	10		34	MS91528-2K2B	KNOB
SEE NOTE 6	2		33	1015825-8	ROTARY SWITCH
	1		32	1015825-6	ROTARY SWITCH
	3		31	1015825-4	ROTARY SWITCH
	1		30	1900221-021	SWITCH & CONNECTOR ASSY.
	1		29	1900221-011	SWITCH & CONNECTOR ASSY.
			28		
SEE NOTE 6	1		27	1015943-1	BEZEL-2 DIGIT
	2		26	1015912-193	SCREW, NYLON-FLATHEAD
	1		25	1900220	SPACER, DIGITAL READOUT
SEE NOTE 6	1		24	1015844-001	DIGITAL READOUT
	2		23	MS-90078-12-1	FUSE
	2		22	MS-26572-1	FUSE HOLDER-SPARE
SEE NOTE 6	1		21	1015873-008	FUSE HOLDER
			20		
	14		19	AN363-C632	NUT, LOCK
	1		18	1900779	HARNESS "B" ASSEM
			17		
			16		
			15		
			14		
	24		13	MS-35216-24	SCREW PAN HEAD
	26		12	MS-35333-71	WASHER, LOCK, INTERNAL TOOTH
	16		11	AN960C-6	WASHER, FLAT
	12		10	1016000-005	HEX. SPACER
	1		9	1900224	COMPONET MOUNT ASSEMBLY
SEE NOTE 6	24		8	MS-35216-25	SCREW, PAN HEAD
	1		7	1900217	TRANSFORMER & REL PNL ASSY.
	6		6	AN363C1032	NUT, SELF-LOCKING
	6		5	1006783-45	SCREW-BUTTON HEAD
	8		4	1015831-257	SCREW-FH, 100°, HEX SOCKET
	2		3	1900015-081	HANDLE ASSEMBLY
	1		2	1900210	DRAWER INSEP. ASSEMBLY
	1		1	1900209	FRONT PANEL

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±

DO NOT SCALE THIS DRAWING

MATERIAL —

CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN

ACSP PN

DRAWN DATE 9 JAN 63
CHECKED 9 JAN 63
APPROVAL
APPROVAL 7/23/63
NASA APPROVAL
MIT APPROVAL

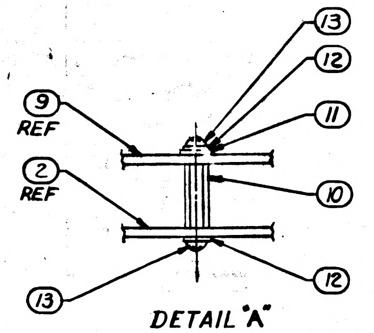
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO. SIZE E 1900057

SCALE 1:1 SHEET OF 3

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
F		CHANGE IN ACCORDANCE WITH MXC-18865C		26 AUG 63	J.J.J.
G		CHANGE IN ACCORDANCE WITH MXC-189124		28 AUG 63	J.E.L.
H		CHANGE IN ACCORDANCE WITH MXC-189922		18 SEP 63	A.N.
J		CHANGE IN ACCO [redacted] MXC-190920 PER TDRR 04978		29 OCT 63 Dec 63	M.M. WK
M		CHANGE IN ACCORDANCE [redacted] MXC-191491		10 JAN 64	
N		REPLACED WITH CHANGE BY REV. P PER MXC 192013 REVISED PER TDR 06969		16 Jan 64 3-7-	

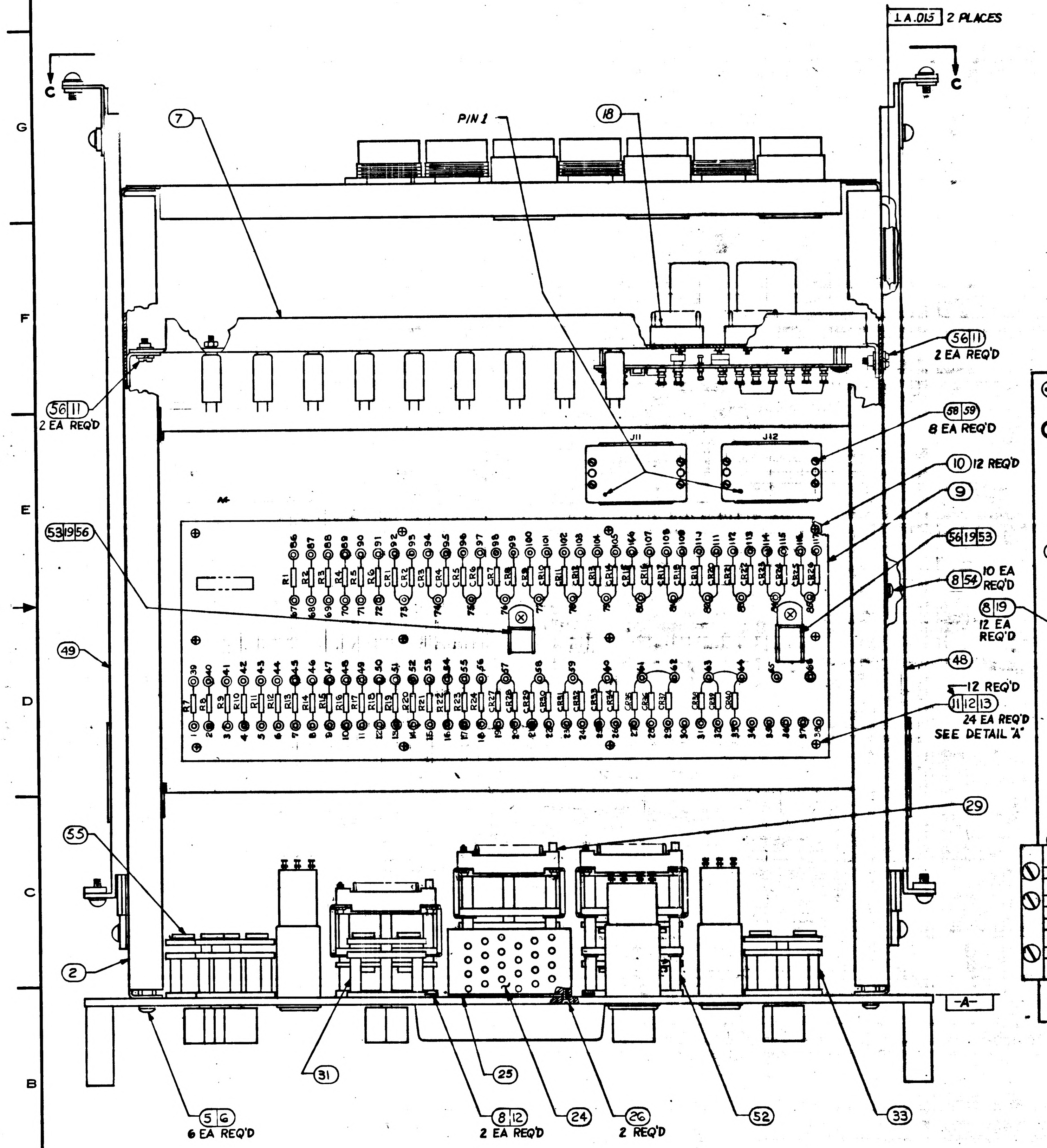


13
12
11
10
12
13
9 REF
2 REF

DETAIL "A"
ITEM NO'S. ARE FOR REFERENCE ONLY

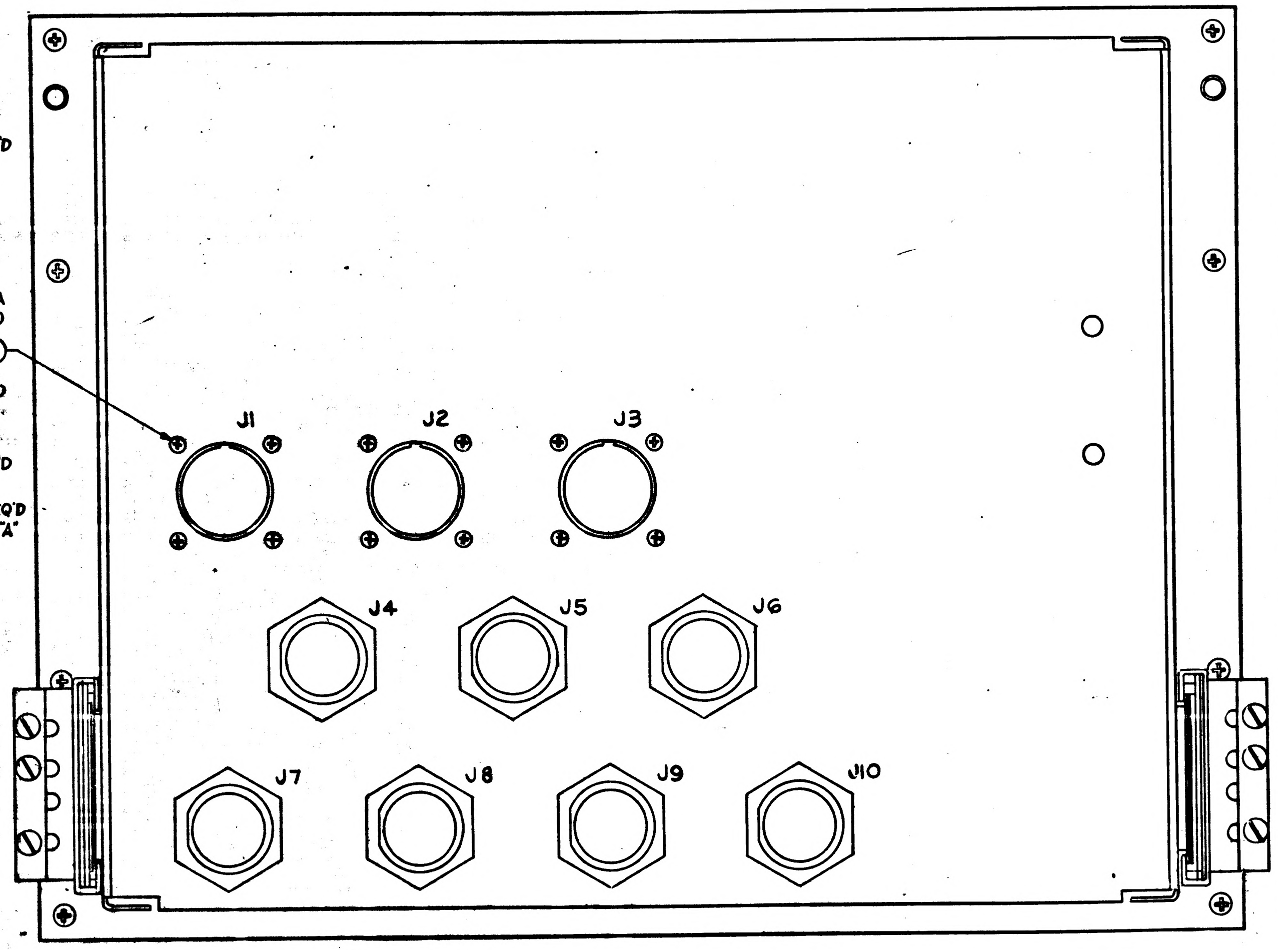
FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63



⊥ A .015 2 PLACES
C
C
7
PIN 1
18
56 11 2 EA REQ'D
56 11 2 EA REQ'D
J11
J12
58 59 8 EA REQ'D
10 12 REQ'D
9
53 19 56
56 19 53
8 54 10 EA REQ'D
8 19 12 EA REQ'D
49
48
12 REQ'D
11 12 13 24 EA REQ'D SEE DETAIL "A"
29
55
2
-A-
5 6 6 EA REQ'D
31
25
8 12 2 EA REQ'D
24
26 2 REQ'D
52
33

VIEW A-A
(SHT 1)



J1
J2
J3
J4
J5
J6
J7
J8
J9
J10

VIEW C-C

Ⓝ REPLACED WITH CHANGE BY REV-P

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 10 JUN 63
CHECKED DATE 10 JUN 63
APPROVAL 14 JUN 63
APPROVAL 7/23/63
NASA APPROVAL 7/24/63
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

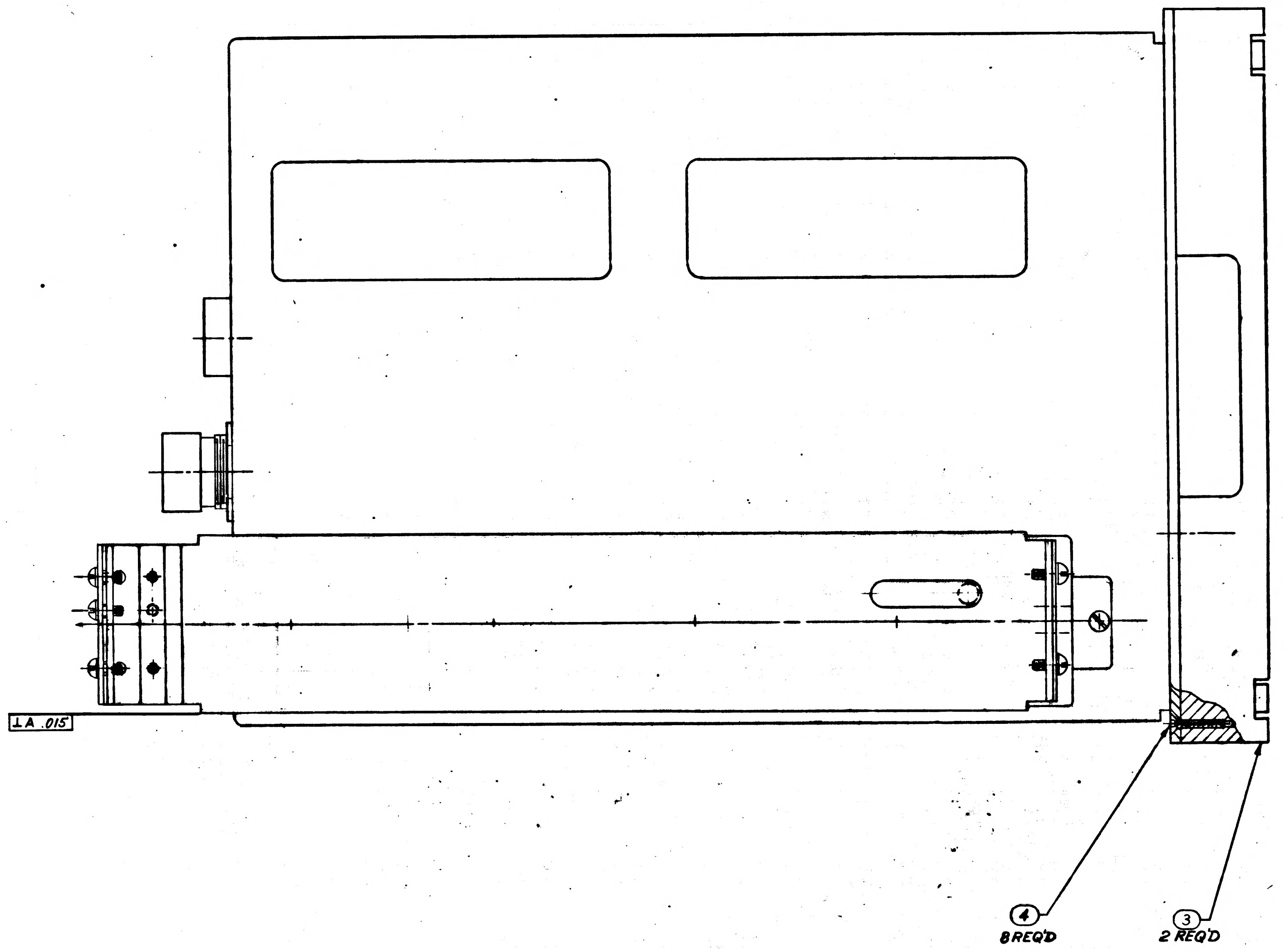
CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 2 OF 3

1900057

INCHES
PHOTOGRAPHIC SCALE ONLY

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
			02175		
J		CHANGE IN ACCORDANCE WITH MXC 190920 PER TDRR 04978		29 OCT 63 [illegible] 63	W.M. [illegible]
N		REPLACED WITH CHANGE BY REV. P PER MXC 192013 REVISED PER TDR 06969		10 JAN 64 3 [illegible]	L.G.H. [illegible]

REV
N



VIEW B-B
SHEET 1

N REPLACED WITH CHANGE BY REV P

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

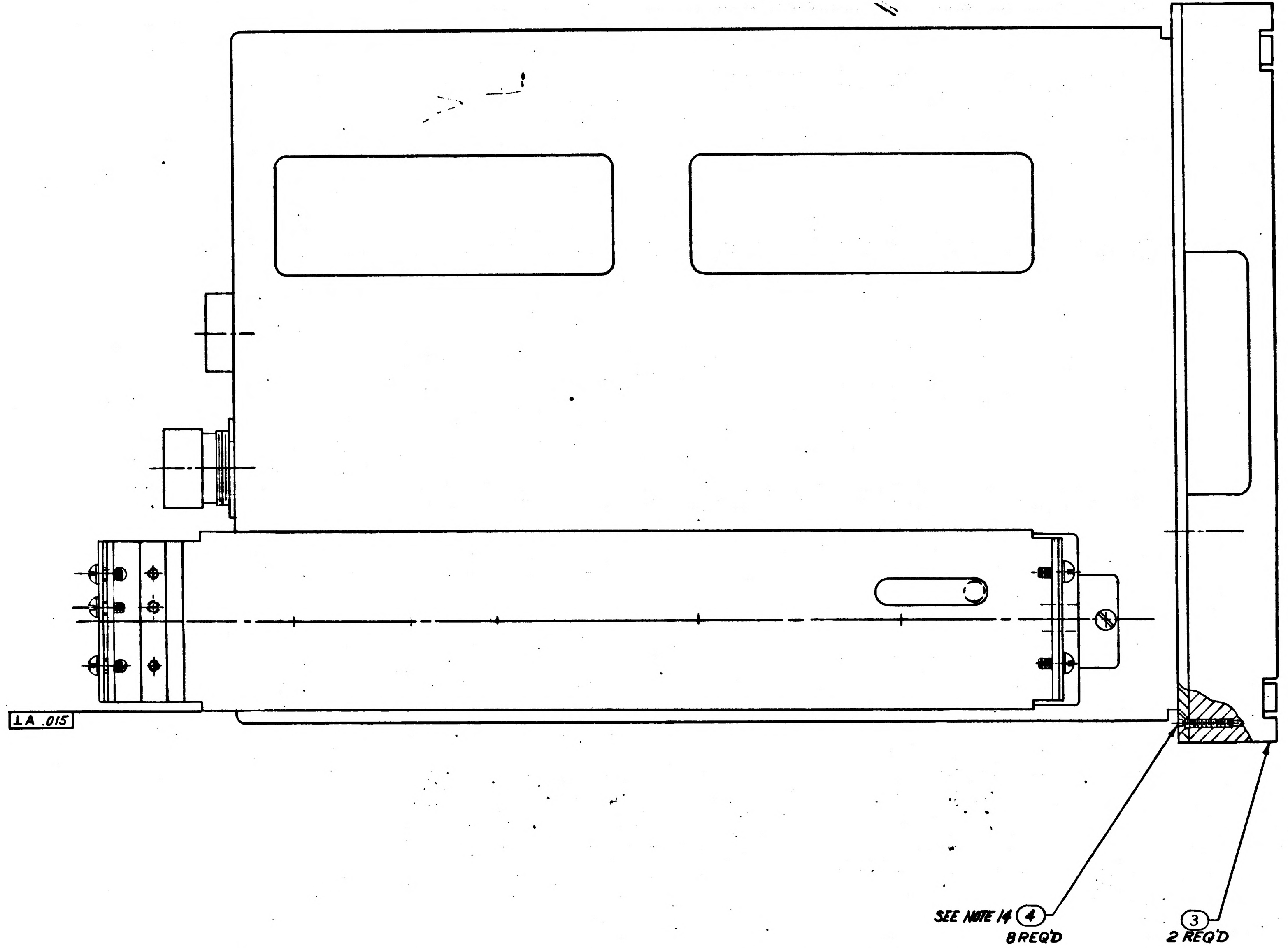
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN [illegible] DATE 6 JUN 63
CHECKED [illegible] 8 JUN 63
APPROVAL [illegible] 14 JUN 63
APPROVAL L. Gedimen 7/23/63
NASA APPROVAL [illegible] 7/24/63
MIT APPROVAL [illegible]

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 3 OF 3

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
P		REPLACES REV. N WITH CHANGE PER MIC 192013 REVISED PER TDR 06969		20 JAN 64 3-7-66	
U		CHANGE IN ACCORDANCE WITH CM14149 REVISE PER TDRR 0697		9 FEB 66 3-15-66	



VIEW B-B
SHEET 1

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 MAY 63

Ⓟ REPLACES REV N WITH CHANGE

1900004-011	1900004-011	
NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN DATE 6 JUN 63
CHECKED 8 JUN 63
APPROVAL 14 JUN 63
APPROVAL
NASA APPROVAL 3-12-64
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

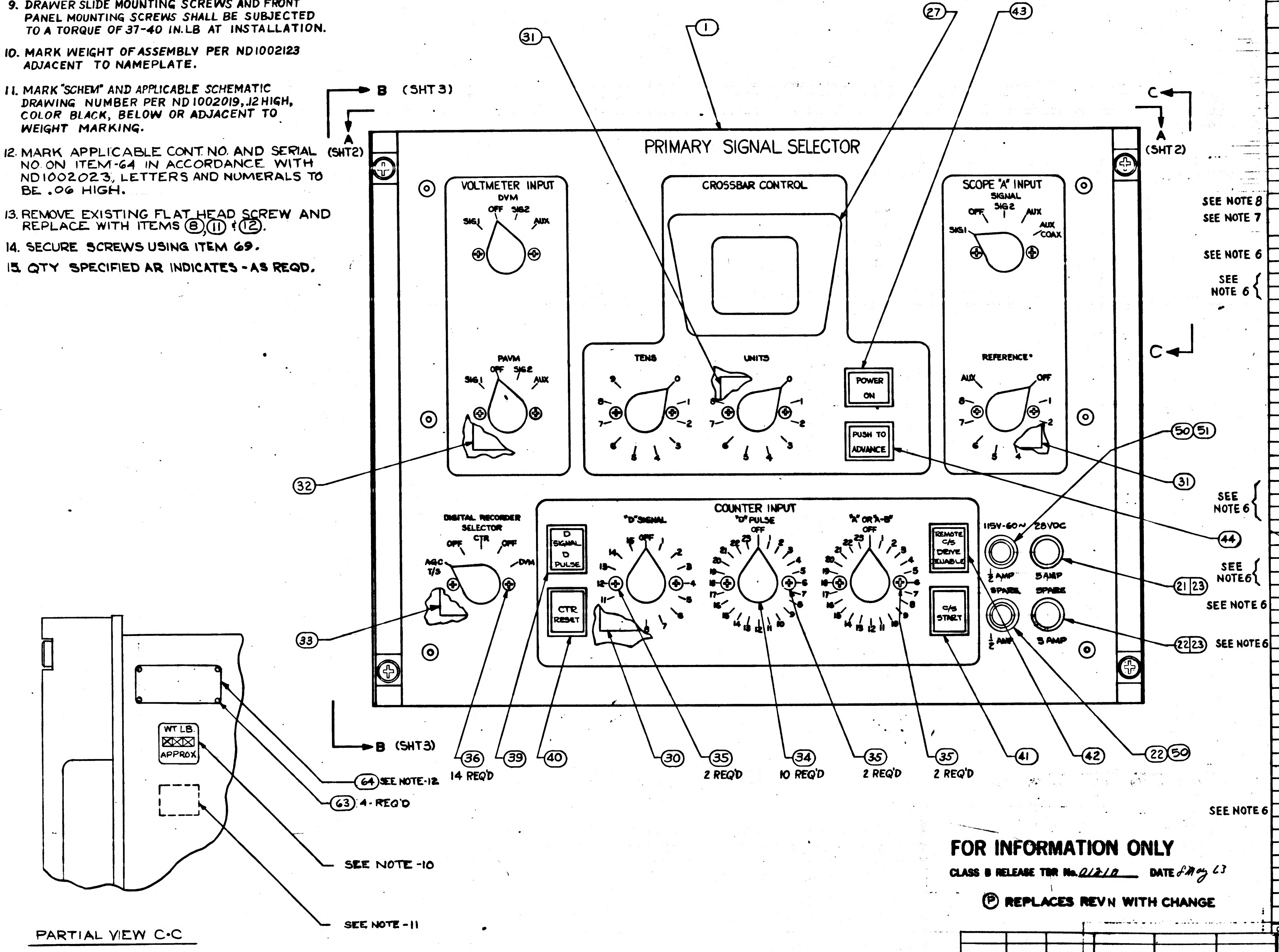
CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 3 OF 3

1900057 U

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
P		REPLACES REV. N WITH CHANGE PER MXC192C13 REVISED PER TDR		1 JAN 64	L.G.H.
R		CHANGE IN ACCORDANCE WITH CMI 92774		31 JAN 64	[illegible]
S		CHANGE IN ACCORDANCE WITH CMI 93215 TDRR 06960		[illegible]	[illegible]
T		CHANGE IN ACCORDANCE WITH CM194035 REVISE PER TDRR 06970		[illegible]	S.A.
U		CHANGE IN ACCORDANCE WITH CM194149 REVISE PER TDRR 06[illegible]		[illegible] FEB 64	[illegible]
V		CHANGE IN ACCORDANCE WITH CM194076 REVISED PER TDR 06972		6 FEB 64	S.A. JRC

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. SERIALIZE PER ND 1002023.
3. THE FRONT PANEL AND DRAWER INSEP. ASSEMBLY ARE TO BE CENTRALIZED WITHIN .010 AT ASSEMBLY.
4. PARTIAL REF. DESIGNATIONS ARE SHOWN: PREFIX WITH UNIT NUMBER OR SUB-ASSEMBLY DESIGNATION (S) OR BOTH FOR COMPLETE DESIGNATION.
5. SOLDER PER MIL-STD-440 USING ITEMS 60 & 61.
6. VENDOR ITEM-SEE SPECIFICATION CONTROL DWG.
7. SELECT AS REQ'D
8. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK
9. DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO A TORQUE OF 37-40 IN.LB AT INSTALLATION.
10. MARK WEIGHT OF ASSEMBLY PER ND1002123 ADJACENT TO NAMEPLATE.
11. MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.
12. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM-64 IN ACCORDANCE WITH ND1002023, LETTERS AND NUMERALS TO BE .06 HIGH.
13. REMOVE EXISTING FLAT HEAD SCREW AND REPLACE WITH ITEMS ⑧, ⑪ & ⑫.
14. SECURE SCREWS USING ITEM 69.
15. QTY SPECIFIED AR INDICATES - AS REQD.



PARTIAL VIEW C-C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

Ⓟ REPLACES REVN WITH CHANGE

				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
				AR		69	MIL-S-46033-C30	SEALING COMPOUND (ES-2544-5)
				2		67	MS21919 DG 19 THRU 21	CLAMP, CUSHIONED SUPPORT (1897073-119 THRU 121)
				2		66	MS21919 DG 8 THRU 11	CLAMP, CUSHIONED SUPPORT (1897073-108 THRU 111)
				1		65	MS21919 DG 7 THRU 9	CLAMP, CUSHIONED SUPPORT (1897073-107 THRU 109)
				1		64	1901304-4	NAMEPLATE, APOLLO, G & N
				4		63	AN535-00-4	SCREW, DRIVE, ROUND HEAD
				1		62	1900778	WIRE LIST B B
				AR		61	MIL-F-14256	FLUX (ES-2798)
							QQ-S-571	FLUX TYPE AR (ES-2175 TYPE 1 or 2)
				AR		60	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
				8		59	1016151-004	NUT, SELF LOCKING
				8		58	AN500AD4-7	SCREW, (1897012-425)
				X		57	ATP 1900057	ASSEMBLY, TEST PROCEEDURE
				10		56	MS-35216-26	SCREW, PAN HEAD
				1		55	015825-014	ROTARY SWITCH
SEE NOTE 8				10		54	1016005-1	SHIM, SLIDE LOCATING
SEE NOTE 7				2		53	MS21919 DG4 THRU 6	CLAMP, CUSHIONED, SUPPORT (1897073-104 THRU 106)
				1		52	1900221-031	SWITCH AND CONNECTOR ASS'Y.
SEE NOTE 6				1		51	1015873-1	FUSE-HOLDER
				2		50	MS90078-7-1	FUSE
SEE NOTE 6				1		49	1015791-010	CHASSIS SLIDE ASSEMBLY
				1		48	1015791-009	CHASSIS SLIDE ASSEMBLY
				X		47	1900498	SCHEMATIC DIAGRAM
						46		
						45		
				1		44	1015869-336	SWITCH, PUSH BUTTON
				1		43	1015869-512	
				1		42	1015869-806	
				1		41	1015869-345	
				1		40	1015869-718	
				1		39	1015869-805	SWITCH, PUSH BUTTON
				1		38	1900096	HARNESS "A" ASSEMBLY
						37		
				14		36	MS35200-25	SCREW, MACH, FLAT CSK XRECS
				6		35	MS35200-40	SCREW, MACH, FLAT CSK XRECS
				10		34	MS91528-2K2B	KNOB
SEE NOTE 6				2		33	1015825-8	ROTARY SWITCH
				1		32	1015825-6	ROTARY SWITCH
				3		31	1015825-4	ROTARY SWITCH
				1		30	1900221-021	SWITCH & CONNECTOR ASSY.
				1		29	1900221-011	SWITCH & CONNECTOR ASSY.
						28		
SEE NOTE 6				1		27	1015943-1	BEZEL-2 DIGIT
				2		26	1015912-193	SCREW, NYLON-FLATHEAD
				1		25	1900220	SPACER, DIGITAL READOUT
SEE NOTE 6				1		24	1015844-001	DIGITAL READOUT
				2		23	MS-90078-12-1	FUSE
				2		22	MS-26572-1	FUSE HOLDER-SPARE
SEE NOTE 6				1		21	1015873-008	FUSE HOLDER
						20		
				18		19	AN363-C632	NUT, LOCK (1896990-261)
				1		18	1900779	HARNESS "B" ASSEM
						17		
						16		
				10		15	1015826-304	SCREW, FLAT HD., HEX SOCKET
				1		14	1015981-005	STANDOFF, HEX
				25		13	MS-35216-24	SCREW PAN HEAD
				29		12	MS-35333-71	WASHER, LOCK, INTERNAL TOOTH
				24		11	AN 960C-6	WASHER, FLAT (1897006-026)
				12		10	1016000-005	HEX. SPACER
				1		9	1900224	COMPONET MOUNT ASSEMBLY
SEE NOTE 6				16		8	MS-35216-25	SCREW, PAN HEAD
				1		7	1900217	TRANSFORMER & REL PNL ASSY.
				6		6	AN363C1032	NUT, SELF-LOCKING
				6		5	1006783-45	SCREW-BUTTON HEAD
				8		4	1015831-253	SCREW-FH, 100°, HEX SOCKET
				2		3	1900015-081	HANDLE ASSEMBLY
				1		2	1900210	DRAWER INSEP. ASSEMBLY
				1		1	1900209	FRONT PANEL
	QUANTITY REQUIRED			011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION

LIST OF PARTS AND MATERIALS

SHEET 1	SHEET 2	SHEET 3
V	V	U
U	T	U
T	T	P
S	S	P
R	R	P
P	P	P

REVISION STATUS OF SHEETS

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	

APPLICATION

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN A/DeCrugo DATE 3 JUN63
CHECKED 8 JUN63
APPROVAL 14 JUN63
APPROVAL
NASA APPROVAL 3-17-64
MIT APPROVAL

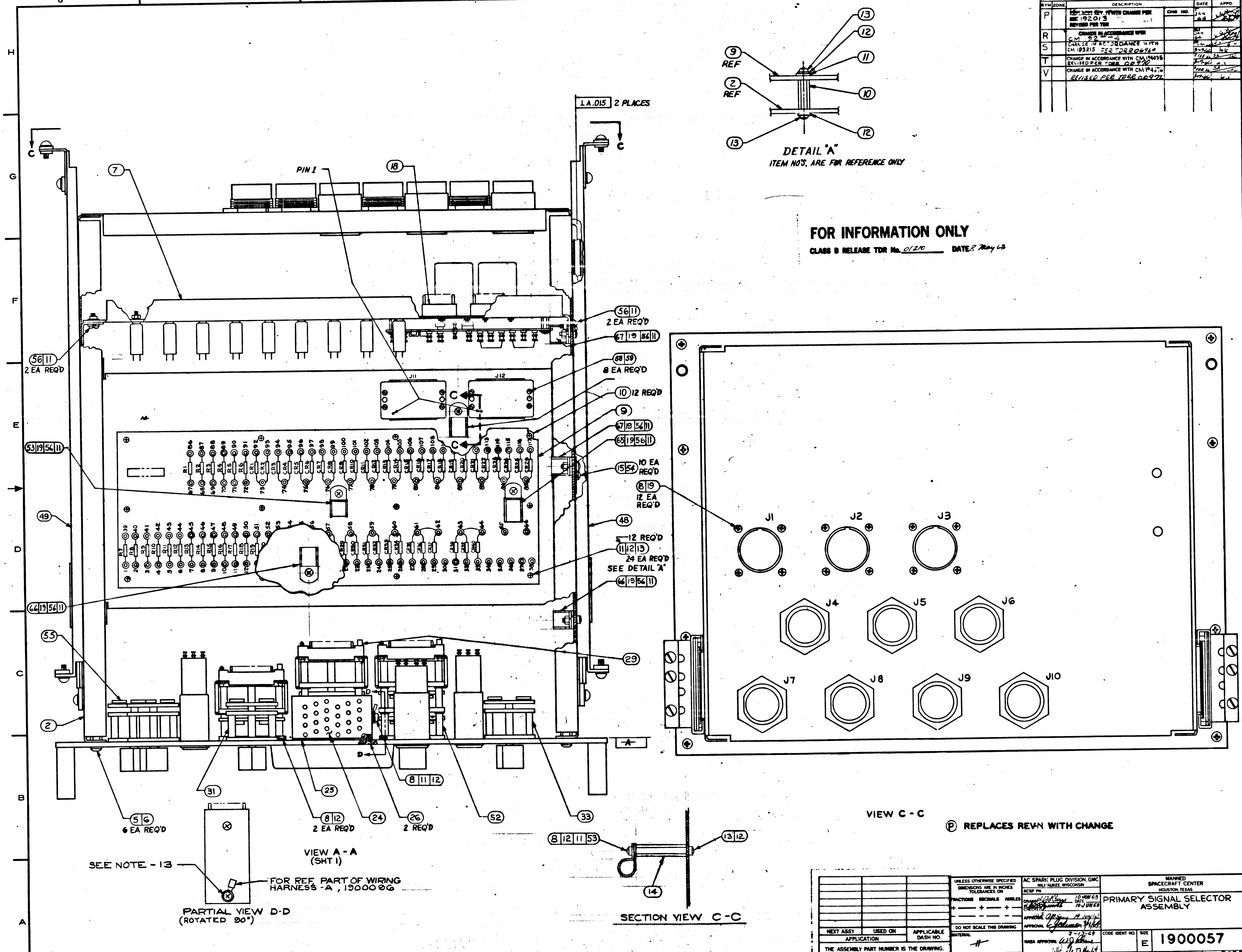
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO. SIZE E 1900057
SCALE 1:1 SHEET 1 OF 3

V 1900057

INCHES
PHOTOGRAPHIC SCALE ONLY



1A.015 2 PLACES
C
PIN 1
7
18
56 11 2 EA REQ'D
67 19 56 11
58 59 8 EA REQ'D
10 12 REQ'D
9
67 19 56 11
65 19 56 11
15 54 10 EA REQ'D
8 19 12 EA REQ'D
J11
J12
53 19 56 11
49
48
12 REQ'D
11 12 13 24 EA REQ'D
SEE DETAIL "A"
66 19 56 11
55
29
2
31
25
8 12 2 EA REQ'D
24
26 2 REQ'D
52
33
5 6 6 EA REQ'D
8 11 12
D
A
VIEW A - A (SHT 1)
SEE NOTE - 13
FOR REF. PART OF WIRING HARNESS - A, 1900086
PARTIAL VIEW D-D (ROTATED 90°)
8 12 11 53
13 12
14
SECTION VIEW C-C
DETAIL "A"
ITEM NO'S. ARE FOR REFERENCE ONLY
9 REF
2 REF
13
12
11
10
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
VIEW C - C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

Ⓟ REPLACES REV-N WITH CHANGE

REVISIONS

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD.
P		REPLACES REV. N WITH CHANGE PER MC 192013 REVISED PER TDR		7 JAN 64	
R		CHANGE IN ACCORDANCE WITH CM 92--4		31 JAN 64	
S		CHANGE IN ACCORDANCE WITH CM 193215 PER TDRR 06960		3-7-64	
T		CHANGE IN ACCORDANCE WITH CM 194035 REVISED PER TDRR 00970		3-7-64	
V		CHANGE IN ACCORDANCE WITH CM 194070 REVISED PER TDRR 06972		6 FEB 64 3-7-64	SA

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING. NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL #
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN 10 JUN 63
CHECKED DATE 10 JUN 63
APPROVAL 14 JUN 63
APPROVAL E. Goldman 3/2/64
NASA APPROVAL W. J. 3-17-64
MIT APPROVAL 17 Mar 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 2 OF 3

INCHES
PHOTOGRAPHIC SCALE ONLY

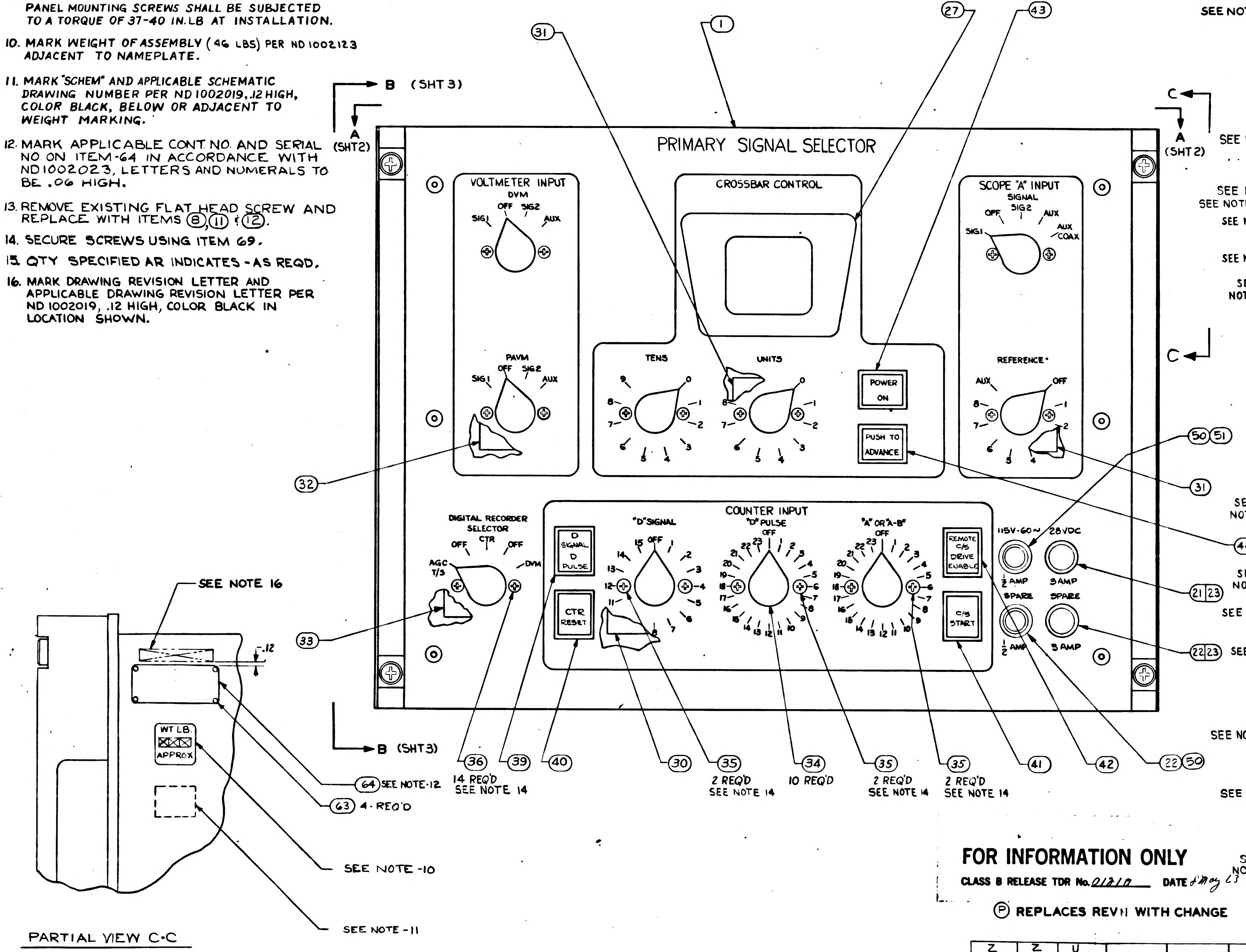
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

3. DIMENSION A SHALL BE EQUAL TO DIMENSION B WITHIN .040 IN.

4. PARTIAL REF. DESIGNATIONS ARE SHOWN: PREFIX WITH UNIT NUMBER OR SUB-ASSEMBLY DESIGNATION (S) OR BOTH FOR COMPLETE DESIGNATION.

5. *SOLDER PER MIL-STD-440 USING ITEMS 60 & 61.*
6. *VENDOR ITEM-SEE SPECIFICATION CONTROL DWG.*
7. SELECT AS REQ'D
8. SHIM TO FIT. PEEL OFF EXCESS SHIM STOCK
9. *DRAWER SLIDE MOUNTING SCREWS AND FRONT PANEL MOUNTING SCREWS SHALL BE SUBJECTED TO A TORQUE OF 37-40 IN.LB AT INSTALLATION.*
10. *MARK WEIGHT OF ASSEMBLY (46 LBS) PER ND 1002123 ADJACENT TO NAMEPLATE.*
11. *MARK "SCHEM" AND APPLICABLE SCHEMATIC DRAWING NUMBER PER ND 1002019, .12 HIGH, COLOR BLACK, BELOW OR ADJACENT TO WEIGHT MARKING.*
12. MARK APPLICABLE CONT. NO. AND SERIAL NO. ON ITEM-64 IN ACCORDANCE WITH ND 1002023, LETTERS AND NUMERALS TO BE .06 HIGH.
13. REMOVE EXISTING FLAT HEAD SCREW AND REPLACE WITH ITEMS ⑧, ⑪ & ⑫.
14. SECURE SCREWS USING ITEM 69.
15. QTY SPECIFIED AR INDICATES - AS REQD.
16. MARK DRAWING REVISION LETTER AND APPLICABLE DRAWING REVISION LETTER PER ND 1002019, .12 HIGH, COLOR BLACK IN LOCATION SHOWN.



B (SHT 3)
A (SHT2)
C
PRIMARY SIGNAL SELECTOR
VOLTMETER INPUT
DVM
SIG1 OFF SIG2 AUX
PAVM
SIG1 OFF SIG2 AUX
CROSSBAR CONTROL
TENS
UNITS
0 1 2 3 4 5 6 7 8 9
POWER ON
PUSH TO ADVANCE
SCOPE "A" INPUT
SIGNAL
SIG1 OFF SIG2 AUX AUX COAX
REFERENCE
AUX OFF 1 2 4 5 6 7 8
DIGITAL RECORDER SELECTOR
OFF CTR OFF AGC T/S DVM
D SIGNAL D PULSE
CTR RESET
COUNTER INPUT
"D" SIGNAL
"D" PULSE
"A" OR "A-B"
OFF
REMOTE C/S DRIVE ENABLE
C/S START
115V-60~
28VDC
½ AMP
3 AMP
SPARE
SPARE
½ AMP
3 AMP
(31) (1) (27) (43)
(32) (33)
(50)(51) (31) (44) (21)(23) (22)(23)
(36) 14 REQ'D SEE NOTE 14
(39) (40) (30)
(35) 2 REQ'D SEE NOTE 14
(34) 10 REQ'D
(35) 2 REQ'D SEE NOTE 14
(35) 2 REQ'D SEE NOTE 14
(41) (42) (22)(50)
SEE NOTE 16
.12
WT LB APPROX
(64) SEE NOTE-12
(63) 4-REQ'D
SEE NOTE -10
SEE NOTE -11

PARTIAL VIEW C-C

REVISIONS					
SYM	ZONE	DESCRIPTION	CHG NO	DATE	APPD
P		REPLACES REV. N WITH CHANGE PER MXC192C13 REVISED PER TDR		17 JAN 64	LGH
R		CHANGE IN ACCORDANCE WITH CM 192724		21 JAN 64	LGH
S		CHANGE IN ACCORDANCE WITH CM 193215 TDRR 06969		23 JAN 64 3-7-64	LGH WR
T		CHANGE IN ACCORDANCE WITH CM194035 REVISE PER TDRR 06970		5 FEB 64 3-7-64	SA JAC WR
U		CHANGE IN ACCORDANCE WITH CM194149 REVISE PER TDRR 06971		5 FEB 64 3-7-64	SA JAC
V		CHANGE IN ACCORDANCE WITH CM194676 REVISED PER TDR 06972		6 FEB 64 3-7-64	S.A. JHC WR
W		CHANGE IN ACCORDANCE WITH CM 195341		2 APR 64	EM
Y		CHANGE IN ACCORDANCE WITH CM 195594 REVISED CUSTOMER DATA (V2-64) 08325		14 APR 64	JG
Z		CHANGE IN ACCORDANCE WITH CM 195963 08326		21 APR 64	JB EF

				X		70	PS1900057	PROCUREMENT SPECIFICATION
				AR		69	MIL-S-40038-C130	SEALING COMPOUND (ES-2544-5)
SEE NOTE 7				2		67	MS21919 DG 19 THRU 21	CLAMP, CUSHIONED SUPPORT (1897073-119 THRU 121)
				2		66	MS21919 DG 8 THRU 11	CLAMP, CUSHIONED SUPPORT (1897073-108 THRU 111)
				1		65	MS21919 DG 7 THRU 9	CLAMP, CUSHIONED SUPPORT (1897073-107 THRU 109)
				1		64	1901304-114	NAMEPLATE, APOLLO, G & N
				4		63	AN535-00-4	SCREW, DRIVE, R.HD. (1897109-004)
				1		62	1900778	WIRE LIST B B
				AR		61	MIL-F-14256 QQ-S-571	FLUX (ES-2798) FLUX TYPE AR(ES-2175 TYPE 1 or 2
				AR		60	QQ-S-571	SOLDER SN60 (ES-2175 ALLOY 1)
SEE NOTE 6				8	✓	59	1016151-004	NUT, SELF LOCKING
				8		58	AN500AD4-7	SCREW, (1897012-425)
				~~X~~		~~57~~	~~ATP 1900057~~	~~ASSEMBLY, TEST PROCEDURE~~
				10		56	MS-35216-26	SCREW, PAN HEAD
SEE NOTE 6				1	✓	55	1015825-014	ROTARY SWITCH
SEE NOTE 6 & 8				10	✓	54	1016005-1	SHIM, SLIDE LOCATING
SEE NOTE 7				2		53	MS21919 DG4 THRU 6.	CLAMP, CUSHIONED, SUPPORT (1897073-104 THRU 106)
				1		52	1900221-031	SWITCH AND CONNECTOR ASS'Y.
SEE NOTE 6				1	✓	51	1015873-1	FUSE-HOLDER
				2		50	MS90078-7-1	FUSE (1897077-107)
SEE NOTE 6				1	✓	49	1015791-010	CHASSIS SLIDE ASSEMBLY
				1	✓	48	1015791-009	CHASSIS SLIDE ASSEMBLY
				X		47	1900498	SCHEMATIC DIAGRAM
						46		
						45		
				1		44	1015867-336	SWITCH, PUSH BUTTON
				1		43	1015869-512	
				1		42	1015869-806	
				1		41	1015869-345	
				1		40	1015869-718	
				1		39	1015869-805	SWITCH, PUSH BUTTON
				1		38	1900096	HARNESS "A" ASSEMBLY
						37		
				14		36	MS35200-25	SCREW, MACH, FLAT CSK XRECS
				6		35	MS35200-40	SCREW, MACH, FLAT CSK XRECS
				10		34	MS91528-2K2B	KNOB (1897080-023)
SEE NOTE 6				2	✓	33	1015825-8	ROTARY SWITCH
				1	✓	32	1015825-6	ROTARY SWITCH
				3	✓	31	1015825-4	ROTARY SWITCH
				1		30	1900221-021	SWITCH & CONNECTOR ASSY.
				1		29	1900221-011	SWITCH & CONNECTOR ASSY.
						28		
SEE NOTE 6				1	✓	27	1015943-1	BEZEL-2 DIGIT
				2	✓	26	1015912-193	SCREW, NYLON-FLATHEAD
				1		25	1900220	SPACER, DIGITAL READOUT
SEE NOTE 6				1	✓	24	1015844-001	DIGITAL READOUT
				2		23	MS-90078-12-1	FUSE (1897077-112)
				2		22	MS-26572-1	FUSE HOLDER-SPARE
SEE NOTE 6				1	✓	21	1015873-008	FUSE HOLDER
						20		
				18		19	AN363-C632	NUT, LOCK (1896990-261)
				1		18	1900779	HARNESS "B" ASSEM
						17		
						16		
SEE NOTE 6				10	✓	15	1015826-304	SCREW, FLAT HD., HEX SOCKET
				1	✓	14	1015981-005	STANDOFF, HEX
				25		13	MS-35216-24	SCREW PAN HEAD
				29		12	MS-35333-71	WASHER, LOCK, INTERNAL TOOTH
				24		11	AN960C-6	WASHER, FLAT (1897006-026)
SEE NOTE 6				12	✓	10	1016000-005	HEX. SPACER
				1		9	1900224	COMPONET MOUNT ASSEMBLY
				16		8	MS-35216-25	SCREW, PAN HEAD
				1	✓	7	1900217	TRANSFORMER & REL PNL ASSY.
				6		6	AN363C1032	NUT, SELF LOCKING (1896990-011)
SEE NOTE 6				6	✓	5	1006783-45	SCREW-BUTTON HEAD
				8	✓	4	1015831-253	SCREW-FH, 100°, HEX SOCKET
				2		3	1900015-081	HANDLE ASSEMBLY
				1		2	1900210	DRAWER INSEP. ASSEMBLY
				1		1	1900209	FRONT PANEL
				011	EFFECTIVITY	ITEM NO.	PART OR IDENTIFYING NUMBER	NOMENCLATURE OR DESCRIPTION
	QUANTITY REQUIRED					LIST OF PARTS AND MATERIALS		

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01210 DATE 8 May 63

Ⓟ REPLACES REV N WITH CHANGE

SHEET 1	SHEET 2	SHEET 3
Z	Z	U
Y	V	U
W	V	U
V	V	U
U	T	U
T	T	P
S	S	P
R	R	P
	P	P
REVISION STATUS OF SHEETS		

NEXT ASSY	USED ON	APPLICABLE DASH NO.
1900004	1900004	011
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

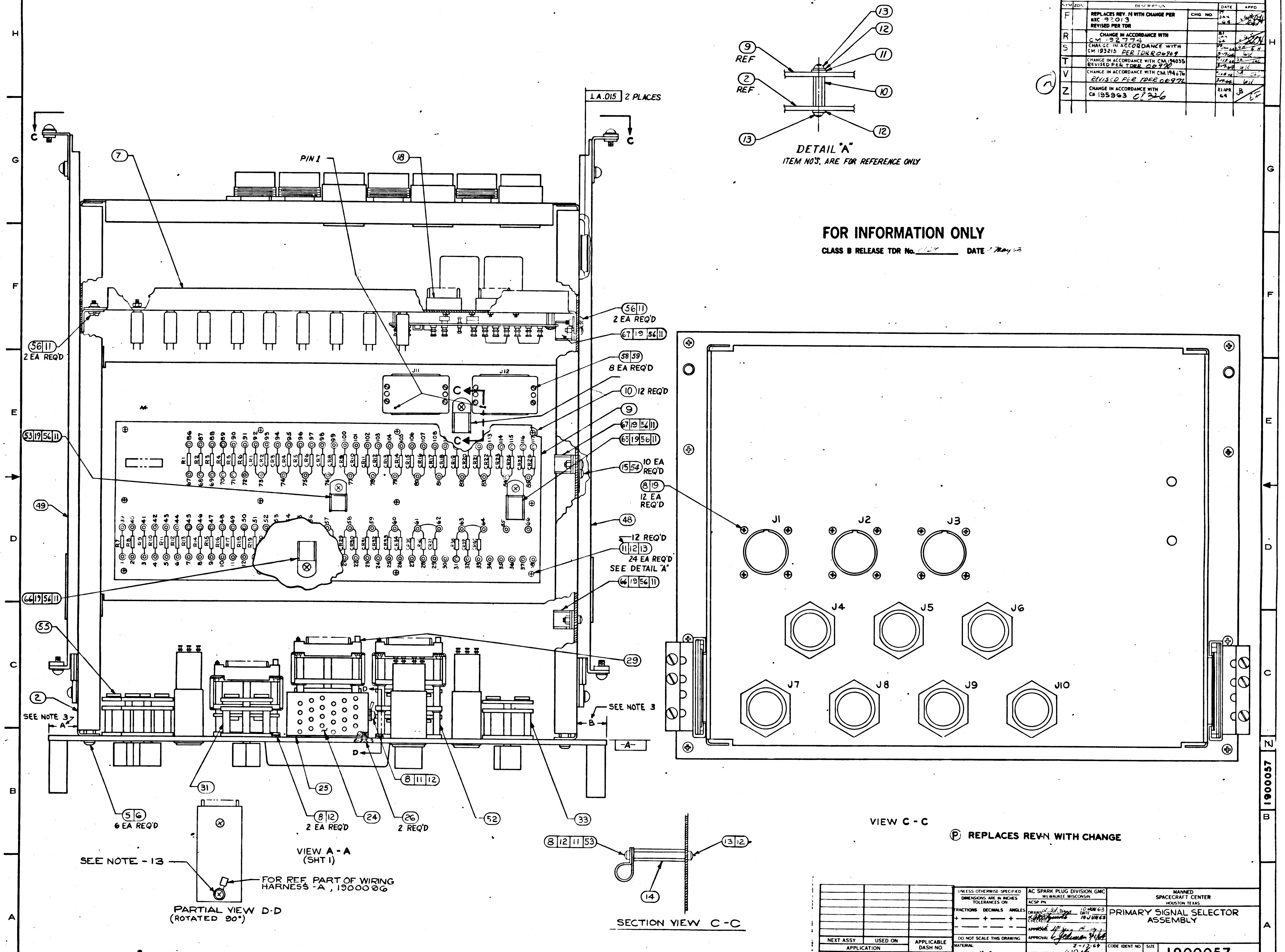
AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN D/Di Ruzzo DATE 6 JUN 63
CHECKED 8 JUN 63
APPROVAL 14 JUN 63
APPROVAL
NASA APPROVAL 3-17-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR ASSEMBLY

CODE IDENT NO.
SIZE E
1900057
SCALE 1:1
SHEET 1 OF 3

SYM	ZONE	DESCRIPTION	CHG NO.	DATE	APPD
F		REPLACES REV. N WITH CHANGE PER MXC 92013 REVISED PER TDR		17 JAN 64	L.G.
R		CHANGE IN ACCORDANCE WITH CM 192774		21 JAN 64	L.G.
S		CHANGE IN ACCORDANCE WITH CM 193215 PER TDRR 06969		23 JAN 64 3-17-64	L.G. E H WK
T		CHANGE IN ACCORDANCE WITH CM 194035 REVISED PER TDRR 00970		5 FEB 64 3-17-64	SA JAC WK
V		CHANGE IN ACCORDANCE WITH CM 194676 REVISED PER TDRR 00972		5 FEB 64 3-17-64	SA JAC WK
Z		CHANGE IN ACCORDANCE WITH CM 195963 08326		21 APR 64	JB EF


DETAIL "A"
ITEM NO'S. ARE FOR REFERENCE ONLY
9 REF
2 REF
13
12
11
10
⊥ A .015 2 PLACES
C
PIN 1
7
18
J11
J12
56 11 2 EA REQ'D
67 19 56 11
58 59 8 EA REQ'D
10 12 REQ'D
9
67 19 56 11
65 19 56 11
15 54 10 EA REQ'D
8 19 12 EA REQ'D
53 19 56 11
56 11 2 EA REQ'D
49
48
12 REQ'D
11 12 13 24 EA REQ'D
SEE DETAIL "A"
66 19 56 11
66 19 56 11
55
29
2
SEE NOTE 3
A
B
-A-
D
8 11 12
31
5 6 6 EA REQ'D
25
8 12 2 EA REQ'D
24
26 2 REQ'D
52
33
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
VIEW C - C
VIEW A - A (SHT 1)
SEE NOTE - 13
FOR REF PART OF WIRING HARNESS -A, 1900086
PARTIAL VIEW D-D (ROTATED 90°)
8 12 11 53
13 12
14
SECTION VIEW C-C

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. ______ DATE 1 May 63

Ⓟ REPLACES REV-N WITH CHANGE

NEXT ASSY	USED ON	APPLICABLE DASH NO.
APPLICATION		

THE ASSEMBLY PART NUMBER IS THE DRAWING NUMBER AND THE DASH NUMBER THAT APPLIES

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL —
CONTRACT NAS 9-497

AC SPARK PLUG DIVISION, GMC
MILWAUKEE, WISCONSIN
ACSP PN
DRAWN L. J. L. Fizzy DATE 10 JUN 63
CHECKED 10 JUN 63
APPROVAL
APPROVAL L. Gedeman
NASA APPROVAL W J 3-17-64
MIT APPROVAL 17 Jun 64

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

PRIMARY SIGNAL SELECTOR
ASSEMBLY

CODE IDENT NO
SIZE E
1900057
SCALE 1:1
SHEET 2 OF 3

1900057